```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                            2 *
                            3         DECK  1                              LAST CHG :08 01 74
                            4         SEQ   0
   000C                     5 X40F    START 0
                            6         TREP
   0A0C                     7         CRG   X'0A00'
                            8 ********************************************************************************
                            9 *                                                                              *
                           10 *                          SECTION PREFACE                                     *
                           11 *                                                                              *
                           12 ********************************************************************************
   0ACC 40F1          0A01 13         DC    XL2'40F1'          PROGRAM ID AND REVISION LEVEL
   0AC2 40            0A02 14         DC    XL1'40'            CP END INTERRUPT FLAG
   0AC3 01            0A03 15         DC    XL1'01'            CURRENT ROUTINE NUMBER
   0A04 0DC6          0A05 16         DC    AL2(IH)            INTERRUPT HANDLER
   0A06 0A0D          0A07 17         DC    AL2(RTN01)         ADDRESS OF FIRST ROUTINE
   0A08 0000          0A09 18         DC    XL2'0000'          ERROR RECORDING TABLE
   0A0A 405000        0A0C 19 UDT1    DC    XL3'405000'        3741
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                           21 ********************************************************************************
                           22 *                                                                              *
                           23 *          THIS ROUTINE WRITES A PATTERN OR READS RECORDS DEPENDING             *
                           24 *          ON HOW THE 3741 IS SET UP.  IT CHECKS FOR ERRORS.                   *
                           25 *          IT WAITS FOR 3741 INTERRUPT. READ MODE OR WRITE MODE.               *
                           26 *                                                                              *
                           27 ********************************************************************************
                           28
   0A0D 01            0A0D 29 RTN01   DC    XL1'01'            ROUTINE 1
   0A0E 80            0A0E 30         DC    XL1'80'            MANUAL INTERVENTION REQUIRED
   0A0F FFFF          0A10 31         DC    XL2'FFFF'          LAST ROUTINE
                           32
                           33 *  -------
                           34 *   INITIAL SET UP FOR SYSTEM TEST.
                           35 *
                           36 *  -------
                           37
   0A11 31 41 133A         38         LIO   FUNBIT,LFUNC       FUNCTION REG TO X'4000'
   0A15 3C 00 131A         39         MVI   INTFLG,X'00'       CLEAR INTERRUPT FLAG
                           40
                           41 *  -------
                           42 *   SET UP FOR I/O LOOP
                           43 *
                           44 *  -------
                           45
   0A19 3C 55 1319         46         MVI   CHAR,X'55'         START WITH 0C FIELD
   0A1D 0C 00 0F5A 1319    47         MVC   BUFF2+127(1),CHAR  PROPOGATE 'CHAR' THROUGH BUFFER
   0A23 0C 7E 0F59 0F5A    48         MVC   BUFF2+126(127),BUFF2+127
   0A29 0C 04 132F 132A    49         MVC   SEQ(5),ALMCNE      INITIALIZE COUNTER (FOFOF1)
   0A2F 0C 04 0EE0 132F    50         MVC   BUFF2+5(5),SEQ     PUT COUNT INTO BUFFER
                           51
                           51
                           52 * WAIT FOR SOME 3741 SIGNAL BEFORE BEGINNING.  THEN IGNORE THAT
                           53 *  FIRST INTERRUPT.
   0A35 F3 40 04           54 BEG     SIO   SDISAB,SCNTRL      DISABLE INTERRUPT.
                   0A38    55 HGRDY   EQU   *
   0A38 30 42 1340         56         SNS   SNS3,SLINES        WAIT FOR READ OR WRITE MODE ETC.
   0A3C 39 03 133F         57         TBF   SNS3-1,X'03'
   0A40 39 FC 1340         58         TBF   SNS3,X'80'+EDS+BIPE+EOR+ECJ+AT  OR ERRORS.
   0A44 CC 90 0A50         59         BF    IGA                BRANCH IF ONE OR MORE IS ON.
   0A48 C0 87 0CCF         60         B     SUP                GO TO SUPERVISOR
   0A4C C0 87 0A38         61         B     HGRDY
                           62
   0A50 3C 87 0A7A         63 IGA     MVI   IGB+1,X'87'        SET UP FOR RB ROUTINE TO IGNORE
                           64 *                                   THIS 1ST INTERRUPT.
   0A54 F3 40 01           65         SIO   SRESET,SCNTRL      KILL THIS INTERRUPT.
                           66
                           66
                           66
                           67 *  ---------------------------------
                           68 *   I/O LOOP
                           69 *
                           70 *  ---------------------------------
                           71
                           71
                           71
                   0A57    72 WLOOP   EQU   *
   0A57 0C 7F 0EDA 0F5A    73         MVC   BUFF1+127(128),BUFF2+127   MOVE PATTERN BUFFER TO I/O BUFF
   0A5C C0 87 0A75         74         B     RW                 GO TO READ/WRITE ROUTINE
   0A61 C0 E7 0C78         75         B     CHKBUF             CHANGE PATTERN IN BUFFER
   0A65 3D FF 1312         76         CLI   UNX,X'FF'          SEE IF UNEXPECTED INTERRUPT OCCURRED
   0A69 C0 81 0D95         77         BE    UNE                BRANCH IF SO
   0A6D C0 E7 0A57         78         B     WLOOP              BRANCH BACK FOR NEXT RECORD
                           79 *
   0A71 C0 E7 0A75         80         B     *+4                FILLER
                           81
                           81
                           81
```


5

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          83 ***************
                          84 *  RW         *
                          85 ***********************************************************
                          86 *     READ OR WRITE ROUTINE.                              *
                          87 *     READS OR WRITES AS DETERMINED BY 3741 SET UP        *
                          88 ***********************************************************
                          89
 0A76 34 08 0B70          90 RW     ST    RWR+3,ARR           SET UP RETURN
 0A79 F2 07 08            91 IGB    JC    IGC,X'07'           ALTERED TO IGNORE 1ST INTERRUPT
 0A7C C0 87 0CF6          92        B     GETINT              WAIT FOR INTERRUPT
                          93
 0A80 20 43 1340          94        SNS   SNS3,SLINES         SNS IO TRANSFER LINES
 0A84 3C C7 0A7A          95 IGC    MVI   IGE+1,X'07'         IGNORE 1ST INTERRUPT ONLY
                          96 *  TEST FOR ERROR INDICATION
 0A88 39 FC 1340          97        TBF   SNS3,X'80'+EDS+BIPE+EOR+EOJ+AT
 0A8C C0 90 0B71          98        BF    STATER              IF NOT OFF, GO PRINT STATUS ERROR
                          99
 0A90 39 03 133F         100        TBF   SNS3-1,X'03'        SEE IF READ OR WRITE MODE ON
 0A94 C0 10 0BF7         101        BT    NOWCDE              STATUS ERROR IF BOTH OFF
 0A98 38 03 133F         102        TBN   SNS3-1,X'C3'        SEE IF READ OR WRITE MODE ON
 0A9C C0 10 0CE2         103        BT    TCWODE              STATUS ERROR IF BOTH ON
                         104
                         104
                         104
                         105
                         105
                         105
                         106 *  SET UP READ OR WRITE ACCORDING TO 3741
 0AA0 3C 42 0AC3         107        MVI   DOSIO+1,SWRITE
 0AA4 38 01 133F         108        TBN   SNS3-1,X'01'        IF READ MODE ON AND
 0AA8 39 02 133F         109        TBF   SNS3-1,X'02'          WRITE MODE OFF,
 0AAC F2 10 04           110        JT    MODEOK                  THEN GO ON WITH WRITE
 0AAF 3C 41 0AC3         111        MVI   DOSIO+1,SREAD       OTHERWISE ASSUME READ
                         112
                         112
                         112
                    0AB3 113 MODEOK EQU   *
 0AB3 F3 43 08           114        SIO   RE,SCTL1            RESPOND TO WRITE/READ MODE
 0AB6 31 42 133E         115        LIO   LENGTH,LLCR         LOAD LENGTH COUNT REGISTER (7F)
 0AEA 21 44 0F5D         116        LIO   BUFFID,LCAR         LOAD DATA ADDRESS REGISTER
 0ABE C0 87 0DA9         117        B     ENABLE              ENABLE INTERRUPTS (MOD 15)
                         118
                         119 *                                ------------------
 0AC2 F3 00 00           120 DOSIO  SIO   X'00',*-*           SIO TO READ OR WRITE
                         121 *                                ------------------
 0AC5 3C 02 0C6F         122        MVI   WSEC,2
 0AC9 C1 42 0AD0         123 WAITBY TIO   ISESY,TBSY          BRANCH IF BUSY
 0ACD F2 87 0C           124        J     SNCTBY
 0AD0 C0 87 0C1C         125 ISBSY  B     WAIT                GO WAIT FOR BUSY TO DROP
 0AD4 C0 87 0CB3         126        B     TOOBSY              IF TIMEOUT, HALT ERROR
 0AD8 C0 87 0AC9         127        B     WAITBY
                    0ADC 128 SNOTBY EQU   *                   NOT BUSY
                         129
 0ADC C0 87 0CF6         130        B     GETINT              WAIT FOR INTERRUPT
                         131
 0AE0 30 42 1340         132        SNS   SNS3,SLINES         SNS I/O TRANSFER LINES
 0AE4 0C 01 133E 1348    133        MVC   SNS2(2),SNS2I       OBTAIN STATUS (SENSED PREVIOUSLY)
                         134
                         135 * CHECK FOR NO-CP
                         136
 0AEA 38 04 133D         137        TBN   SNS2-1,X'04'        QUIT IF NO-OP BIT ON.
 0AEE CC 90 0B09         138        BF    NOOPOK
 0AF2 F2 43 50           139        SIC   RSR+RECJ,SCTL1      SENSE RESPONSE/EOJ
 0AF5 C0 87 021A         140        B     PRINT               NO-OP'D SIO
 0AF9 C6                 141        DC    XL1'C6'
 0AFA 28                 142        DC    AL1(MSG6-MSG6B)
 0AFC 10F1               143        DC    AL2(MSG6)
 0AFE 4082               144        DC    XL2'4082'
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0AFF C0 87 0222         145        B     HALT
 0B03 4082               146 MT82   DC    XL2'4082'
 0B05 C0 87 0A35         147        B     BEG                 RETURN TO BEGINNING
                         148
                         149 * CHECK FOR DATA TRANSFER PARITY ERROR
                         150
 0B09 38 08 133D         151 NOOPOK TBN   SNS2-1,X'C8'        DATA XFER PARITY ERROR ?
 0B0C F2 90 17           152        JF    NOCTPE
 0B10 F3 43 90           153        SIO   RSR+BOPE,SCTL1      SENSE RESPONSE / BUS OUT PARITY ERR
 0B13 C0 87 021A         154        B     PRINT               BUS OUT PARITY ERROR
 0B17 C6                 155 0B17   DC    XL1'C6'
 0B18 4F                 156 0B18   DC    AL1(MSG7-MSG7B)
 0B19 1140               157 0B1A   DC    AL2(MSG7)
 0B1B 4031               158 0B1C   DC    XL2'4081'
 0B1D C0 87 0222         159        B     HALT
 0B21 4081               160 0B22   MT81  DC    XL2'4081'
 0B23 C0 87 0A35         161        B     BEG                 RETURN TO BEGINNING
                         162
                         163 *  CHECK STATUS ERROR
                         164
                    0B27 165 NOCTPE EQU   *
 0B27 39 EC 1340         166        TBF   SNS3,X'80'+EDS+BIPE+EOJ+AT  CHECK FOR STATUS ERRORS
 0B2B C0 90 0B71         167        BF    STATER              IF NOT OFF, PRINT STATUS ERROR
 0B2F 3D FF 133E         168        CLI   SNS2,X'FF'          LCR = FF ?
 0B33 F2 01 30           169        JE    AOK
 0B36 3C 01 0C6F         170        MVI   WSEC,1
 0B3A C0 87 0C1C         171 W1     B     WAIT                WAIT
 0B3E C0 87 0B4E         172        B     *+8                   ONE
 0B42 C0 87 0B3A         173        B     W1                      SECOND
 0B46 F3 43 10           174        SIC   RSR,SCTL1           RESPONSE TO LCR ERROR
 0B49 C0 87 021E         175        B     UNPACK              SET UP FOUND LCR VALUE
 0B4D 01                 176        DC    XL1'1'
 0B4E 123E               177        DC    AL2(SNS2)
 0B50 1198               178        DC    AL2(MSG9)
                         179
 0B52 C0 87 021A         180        B     PRINT
 0B56 C6                 181        DC    XL1'C6'
 0B57 33                 182        DC    AL1(MSG9-MSG9B)
 0B58 1196               183        DC    AL2(MSG9)
 0B5A 4C88               184        DC    XL2'4C88'
 0B5C C0 87 0222         185        B     HALT                LCR ERROR
 0B60 4088               186 MT88   DC    XL2'4088'
 0B62 C0 87 0A35         187        B     BEG                 RETURN TO BEGINNING
                         188
                         189 ***
                         190 ***    RESPOND TO SUCCESSFUL SIO
                         191 ***
                         192
 0B66 C0 87 0DA9         193 AOK    B     ENABLE              ALLOW NEXT INTERRUPT
 0B6A F3 43 08           194        SIO   RE,SCTL1            RESPONSE (SIO SUCCESSFUL)
 0B6C C0 87 0000         195 RWR    B     *-*                 RETURN TO CALLER
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          197 ************************************************
                          198 *    SUBROUTINES                               *
                          199 *                                              *
                          200 ************************************************
                          201
                          202 ************
                          203 * STATER
                          204 ****************************
                    0B71  205 STATER EQU   *
 0B71 34 0E 0BF6          206         ST    STATRR+3,ARR          SET UP RETURN
                          207
                          208 *  FOR END OF JOB.  RESPONSE IS GIVEN.  THEN CONTROL IS RETURNED TO
                          209 *    ROUTINE WHICH WAITS FOR A SIGNAL FROM 3741.
 0B75 38 08 1340          210         TBN   SNS3,EOJ              IF ITS EOJ ONLY
 0B79 39 F7 1340          211         TEF   SNS3,X'FF'-EOJ          THEN RESPOND
 0B7D F2 90 C7            212         JF    STAT1                 OTHERWISE, GO ON WITH ERROR
 0B80 F3 43 08            213         SIO   RE,SCTL1              RESPOND TO EOJ
 0B83 C0 87 0A38          214         B     HGRDY                 GO BACK AND WAIT FOR READINESS
                          215
                    0B87  216 STAT1   EQU   *
 0B87 F3 43 08            217         SIO   RE,SCTL1               RESPOND
 0B8A C0 87 0B8E          218         B     *+4
 0B8E C0 87 021E          219         B     UNPACK
 0B92 02                  220         DC    IL1'2'          0B92
 0B93 1340                221         DC    AL2(SNS3)       0B94
 0B95 0E5A                222         DC    AL2(STATMG)     0B96
 0B97 C0 87 021A          223         B     PRINT
 0B9B C2                  224         DC    XL1'C2'         0B9B
 0B9C 23                  225         DC    IL1'35'         0B9C
 0B9D 0E5A                226         DC    AL2(STATMG)     0B9E
 0B9F 4083                227         DC    XL2'4083'       0BA0   STATUS ERROR
                          228
                          229 *
                          230 * SHIFT OFF BITS AND PUT IN MESSAGE DESCRIBING THAT BIT AND PRINT
                          231 *
                          232 *
 0BA1 C2 01 0F71          233         LA    STAB,XR1
 0BA5 0C 01 1332 1340     234         MVC   WORK(2),SNS3          PUT SNS3 INTO WORK AREA
 0BAB 0E 00 1332 1332     235 SPLOOP  ALC   WORK(1),WORK
 0BB1 C0 A0 0BBC          236         BOL   SETPT                 IF THAT BIT IS ON, GO PRINT
 0BB5 D2 01 14            237         LA    SLEN(,XR1),XR1
 0BB8 C0 87 0BAB          238         B     SPLOOP                CONTINUE UNTIL BIT FOUND
                    0BBC  239 SETPT   EQU   *
 0BBC 34 01 0BE8          240         ST    P8,XR1                POINT TO LINE WHICH DESCRIBES BIT
                          241
 0BC0 38 04 1340          242         TBN   SNS3,AT               SEE IF THIS WAS ATTENTIO REQ'D
 0BC4 F2 90 1A            243         JF    NOTAT                 IF NOT CONTINUE NORMALLY
 0BC7 3D 42 0AC3          244         CLI   DOSIO+1,SWRITE        WERE WE WRITING WHEN ATT REQ'D FOUND
 0BCB F2 01 13            245         JNE   NOTAT                 IF NOT, CONTINUE NORMALLY
 0BCE C0 87 021A          246         B     PRINT                 PRINT ATT REQ'D, BUT IGNORE MAYBE
                    0BD2  247         DC    XL1'81'                 IGNORE IF 10E1 ON 3741 SCREEN
                    0BD3  248         DC    AL1(MSG14-MSG14B)
                    0BD5  249         DC    AL2(MSG14)
                          250         B     PRINT                  MSG CONTINUED
                    0BDA  251         DC    XL1'86'
                    0BDB  252         DC    AL1(MSG15-MSG15B)
                    0BDD  253         DC    AL2(MSG15)
                          254         J     HLTAT
                    0BE1  255 NOTAT   EQU   *
                          256
 0BE1 C0 87 021A          257         B     PRINT
 0BE5 86                  258         DC    XL1'86'         0BE5
 0BE6 14                  259         DC    AL1(SLEN)       0BE6
 0BE7 0000                260 P8      DC    AL2(*-*)        0BE8
                          261
 0BE9 C0 87 0222          262 HLTAT   B     HALT                  ERROR DURING WAIT FOR R/W MODE
 0BED 4083                263 HT83    DC    XL2'4083'       0BEE
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0BEF C0 87 0A35          264         B     BEG                   RETURN TO BEGINNING
                          265
 0BF3 C0 87 0000          266 STATRR B      *-*       RETURN
                          267
                          267
                          267
                          268 ************
                          269 * NOMODE  *
                          270 ****************************
                    0BF7  271 NOMODE EQU   *
 0BF7 34 0E 0C1B          272         ST    NOMODR+3,ARR          SET UP RETURN
                          273
 0BFB C0 87 021E          274         B     UNPACK                UNPACK SNS INTO PRINTOUT
 0BFF 02                  275         DC    XL1'2'          0BFF
 0C00 1340                276         DC    AL2(SNS3)       0C01
 0C02 1245                277         DC    AL2(MSG13)      0C03
                          278
 0C04 C0 87 021A          279         B     PRINT                 NC READ OR WRITE MODE.
 0C08 C6                  280         DC    XL1'C6'         0C08
 0C09 33                  281         DC    AL1(MSG13-MSG13B)
 0C0A 1245                282         DC    AL2(MSG13)
 0C0C 408C                283         DC    XL2'408C'       0C0D
 0C0E C0 87 0222          284         B     HALT                  8C  NO READ OR WRITE MODE ON.
 0C12 408C                285 HT8C    DC    XL2'408C'       0C13
 0C14 C0 87 0A35          286         B     BEG                   RETURN TO BEGINNING
                          287
 0C18 C0 87 0000          288 NOMODR B      *-*       RETURN
                          289 ************
                          290 * WAIT    *
                          291 ****************************************
                          292 *    SUBROUTINE  WAITS 1 MILLI SEC PER CALL.  AFTER EACH SEC IT
                          293 *     DECREMENTS SECOND COUNT.
                          294 *      SAMPLE LINKAGE --
                          295 *
                          296 *                MVI   WSEC,5      BEFORE LOOP, SET UP # OF SECONDS
                          297 *          LOOP  B     WAIT        <---  LINKAGE TO TIMEOUT ROUTINE
                          298 *                B     TIMOUT      <---  WAIT RETURNS HERE FOR TIMOUT
                          299 *                B     LOOP        <---  WAIT RETURNS HERE NOMALLY
                          300 *
                          301 ****************************************
                          302
                    0C1C  303 WAIT    EQU   *
 0C1C 34 08 0C6B          304         ST    WAITR+3,ARR           SET UP RETURN
 0C20 C0 87 0CCF          305         B     SUP                   GO TO SUPERVISOR
 0C24 3D 00 0C6F          306         CLI   WSEC,0                NEW COUNT VALUE ?
 0C28 F2 81 12            307         JE    OLDSEC
 0C2B 0C 01 0C71 0C6F     308         MVC   WSECA(2),WSEC         PUT NEW SEC COUNT INTO WORK
 0C31 0F 01 0C6F 0C6F     309         SLC   WSEC(2),WSEC          ZERO THE MAIN SEC COUNT.
 0C37 0C 01 0C6D 0C73     310         MVC   WCNT(2),W1000         SET UP TO DO 1000 TIMES
 0C3D 0D FF 0C3D 0C3D     311 OLDSEC CLC    *(256),*            WAIT 1 MILLI
 0C43 0D 3B 0C43 0C43     312         CLC   *(60),*
 0C49 0F 01 0C6D 0C75     313         SLC   WCNT(2),W0001         DO 1000 TIMES
 0C4F F2 01 10            314         JNZ   WAITRN                  THROUGH LOOP
 0C52 0C 01 0C6D 0C73     315         MVC   WCNT(2),W1000         SET UP TO DO ANOTHER 1000 MILLI SEC
 0C58 0F 01 0C71 0C75     316         SLC   WSECA(2),W0001        DECREMENT NUMBER OF SEC TO WAIT
 0C5E C0 81 0C68          317         BZ    WAITR                 IF IT TIMED OUT, RETURN DIRECTLY
 0C62 0E 01 0C6B 0C77     318 WAITRN ALC    WAITR+3(2),W0004      RETURN TO CALLER +4
 0C68 C0 87 0000          319 WAITR  B      *-*
                          320
 0C6C 0000                321 WCNT    DC    XL2'0000'       0C6D
 0C6E 0000                322 WSEC    DC    XL2'0000'       0C6F
 0C70 0000                323 WSECA   DC    XL2'0000'       0C71
 0C72 03E8                324 W1000   DC    IL2'1000'       0C73
 0C74 0001                325 W0001   DC    IL2'1'          0C75
 0C76 0004                326 W0004   DC    IL2'4'          0C77
                          327
                          327
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                328 ***********
                                329 * CHGBUF  *
                                330 *        *
                                331 ********************************
                                332 *   CHANGE BUFFER FOR WRITE    *
                                333 *     OR READ.                 *
                                334 *  PATTERN SEQUENCE, 55 AA FF 01 00 55 AA FF 01 00 55 ...
                                335 ********************************
                                336
 0C78 34 08 0C82                337 CHGBUF ST    CHGBUR+3,ARR          FOR RETURN
 0C7C 3D 01 1319                338        CLI   CHAR,X'01'            IF CHAR WAS JUST 01, FORCE 00
 0C80 F2 01 07                  339        JNE   CHG1
 0C83 3C 00 1319                340        MVI   CHAR,X'00'
 0C87 F2 87 0D                  341        J     NORAP                 DON'T INCREMENT
                          0C8A  342 CHG1   EQU   *
 0C8A 0E 00 1319 1310           343        ALC   CHAR(1),INCVAL
 0C90 F2 20 04                  344        JNOL  NORAP
 0C93 3C 01 1319                345        MVI   CHAR,X'01'            AFTER FF FORCE TO 01
                          0C97  346 NORAP  EQU   *
 0C97 0C 00 0F5A 1319           347        MVC   BUFF2+127(1),CHAR
 0C9D 0C 7E 0F59 0F5A           348        MVC   BUFF2+126(127),BUFF2+127 PROPOGATE
 0CA3 06 04 132F 132A           349        AZ    SEQ(5),NUMONE         INCREMENT EBCDIC RECORD COUNTER
 0CA9 0C 04 0EE2 132F           350        MVC   BUFF2+7(5),SEQ          AND PUT IT INTO BUFFER
                                351
 0CAF C0 87 0000                352 CHGBUR B     *-*                   RETURN TO CALLER
                                353
                                353
                                353
                                354 ***********
                                355 * TOOBSY  *
                                356 ********************************
                                357 *  3741 BUSY TOO LONG          *
                                358 *                              *
                                359 ********************************
                                360
 0CB3 34 08 0CCE                361 TOOBSY ST    TOOBSR+3,ARR          FOR RETURN
 0CB7 C0 87 021A                362        B     PRINT                 COMPARE ERROR ON RECORD XXX
                          0CBB  363        DC    XL1'C2'
 0CBC 27                  0CBC  364        DC    AL1(MSG10-MSG10B)
 0CBD 11C2                0CBE  365        DC    AL2(MSG10)
 0CBF 408E                0CC0  366        DC    XL2'408E'
 0CC1 C0 87 0222                367        B     HALT                  BUSY TOO LONG
                          0CC6  368 HT8E   DC    XL2'408E'
 0CC7 C0 87 0A35                369        B     BEG                   RETURN TO BEGINNING
 0CCB C0 87 0000                370 TOOBSR B     *-*                   RETURN
                                371
                                371
                                371
                                372 ***********
                                373 * SUP     *
                                374 ********************************
                                375 *  BRANCHES TO SUPERVISOR IF IN SYSTEM TEST MODE.
                                376 *    OTHERWISE RETURNS TO CALLER
                                377 ********************************
                                378
 0CCF 34 08 0CE1                379 SUP    ST    SUPR+3,ARR            FOR RETURN
 0CD3 3D 40 0A00                380        CLI   X'0A00',X'40'         SEE IF WE ARE RELOCATED.
 0CD7 F2 81 04                  381        JE    SUPR                  IF NOT, GO RIGHT BACK.
 0CDA C0 87 0A0A                382        B     ENTRY                 GO TO SUPERVISOR
                                383
 0CDE C0 87 0000                384 SUPR   B     *-*                   RETURN
                                385
                                385
                                385
                                386 ***********
```



```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                387 * TOMODE  *
                                388 ********************************
                                389 *  COME HERE IF BOTH READ      *
                                390 *    AND WRITE MODES ON.       *
                                391 ********************************
                                392
 0CE2 C0 87 021A                393 TOMODE B     PRINT                 BOTH MODES ON
 0CE6 C6                  0CE6  394        DC    XL1'C6'
 0CE7 28                  0CE7  395        DC    AL1(MSG8-MSG8B)
 0CE8 1168                0CE9  396        DC    AL2(MSG8)
 0CEA 4086                0CEB  397        DC    XL2'4086'
                                398
 0CEC C0 87 0222                399        B     HALT
                          0CF1  400 HT86   DC    XL2'4086'
 0CF0 4086                401        B     BEG                   GO BACK TO BEGINNING
 0CF2 C0 87 0A35                402
                                402
                                402
                                402
                                403 ***********
                                404 * GETINT  *
                                405 ********************************
                                406 *  WAIT FOR AN INTERRUPT       *
                                407 *                              *
                                408 ********************************
                                409
 0CF6 34 08 0D94                410 GETINT ST    GETR+3,ARR            FOR RETURN
 0CFA 3C 07 0C6F                411        MVI   WSEC,7                WAIT 2 SEC FOR INTERRUPT
                                412
                                413 *  CHECK IF USING INTERRUPTS OR JUST THE PENDING BIT.
 0CFE 3D 40 0A00                414        CLI   X'A00',X'40'          ARE WE RELOCATED ?
 0D02 F2 81 07                  415        JE    HNGPND                IF NOT, WAIT FOR PENDING ONLY
 0D05 3D C5 0200                416        CLI   SMCD,C'E'             ARE WE MODEL 15,
 0D09 F2 81 23                  417        JE    HNGINT                IF NOT, WAIT FOR PENDING ONLY
                                418
                                418
                                419 *   WAIT FOR INTERRUPT PENDING
 0D0C 30 42 133E                420 HNGPND SNS   SNS2,SSTAT
 0D10 0C 01 1348 133E           421        MVC   SNS2I(2),SNS2         PUT SNS 2 INTO SNS2I FOR USE LATER
                                422 *                                    AS IF SNSED BY INTERRUPT ROUTINE
 0D16 38 20 133D                423        TBN   SNS2-1,X'20'          IS INTERRUPT PENDING BIT ON ?
 0D1A F2 10 0C                  424        JT    INTOC
 0D1D C0 87 0C1C                425        B     WAIT                  WAIT UNTIL IT DOES
 0D21 C0 87 0D4A                426        B     NOIERR
 0D25 C0 87 0D0C                427        B     HNGPND
 0D29 F3 40 01                  428 INTOC  SIO   SRESET,SCNTRL          RESET IT WHEN IT COMES
 0D2C F2 87 13                  429        J     PEND
                                430
                                430
                                431 *   WAIT FOR INTERRUPT
 0D2F 3D FF 131A                432 HNGINT CLI   INTFLG,X'FF'          INTERRUPT RECEIEVED YET ?
 0D33 F2 81 0C                  433        JE    PEND
 0D36 C0 87 0C1C                434        B     WAIT                  WAIT TIL IT DOES
 0D3A C0 87 0D4A                435        B     NOIERR                TIMEOUT
 0D3E C0 87 0D2F                436        B     HNGINT                LOOP BACK
                                437
                                437
 0D42 3C 00 131A                438 PEND   MVI   INTFLG,X'00'          CLEAR INT FLAG
 0D46 C0 87 0D91                439        B     GETR                  GO RETURN TO CALLER
                                440
                                440
                                441 * INTERRUPT OR INTERRUPT PENDING NOT FOUND.
                                442 *  FIRST SEE IF DEVICE IS ON LINE
                                443
                                443
 0D4A 30 43 1340                444 NOIERR SNS   SNS3,SLINES           FIRST CHECK IF ON-LINE
 0D4E 38 04 133F                445        TBN   SNS3-1,X'04'          IF ON-LINE,
 0D52 F2 10 0A                  446        JT    ONLN                    THEN GO ON
```

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```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

   0D5E C0 87 0222          447        B     HALT
   0D62 4080                0D5A 448 HT80   DC    XL2'4080'              NOT ON-LINE
   0D64 C0 87 0A35          449        B     BEG                    RETURN TO BEGINNING
                            450
                            450
                            0D5F 451 ONLN   EQU   *
                            452 *  CHECK IF USING INTERRUPTS OR JUST THE PENDING BIT.
   0D5F 3D 40 0A00          453        CLI   X'A00',X'40'           ARE WE RELOCATED ?
   0D63 F2 81 0A            454        JE    NOPND                  IF NOT, PENDING BIT MISSED.
   0D66 3D C5 0200          455        CLI   SMOD,C'E'              ARE WE MODEL 15.
   0D6A F2 01 03            456        JNE   NOPND                  IF NOT, PENDING BIT MISSED.
   0D6D F2 87 0D            457        J     NOINT                  IF SO, ACTUAL INTERRUPT MISSED
                            458
                            458
                            459
   0D70 C0 87 021A          460 NOPND  B     PRINT                  INT PEND BIT NOT ON
   0D74 C6                  0D74 461        DC    XL1'C6'
   0D75 28                  0D75 462        DC    AL1(MSG1-MSG1B)
   0D76 0FFD                0D77 463        DC    AL2(MSG1)
   0D78 4084                0D79 464        DC    XL2'4084'
   0D7A F2 87 0A            465        J     NOINT
                            466
   0D7D C0 87 021A          467 NOINT  B     PRINT                  EXPECTED INTERRUPT DID NOT OCCUR
   0D81 C6                  0D81 468        DC    XL1'C6'
   0D82 4F                  0D82 469        DC    AL1(MSG2-MSG2B)
   0D83 1C4C                0D84 470        DC    AL2(MSG2)
   0D85 4084                0D86 471        DC    XL2'4084'
                            472
   0D87 C0 87 0222          473 NOINT  B     HALT                   INTERRUPT DID NOT OCCUR
   0D8B 4084                0D8C 474 HT84   DC    XL2'4084'
   0D8D CC 87 0A35          475        B     BEG                    RETURN TO BEGINNING
   0D91 C0 E7 0000          476 GETR   B     *-*                    RETURN TO CALLER
                            477
                            478
                            478
                            479 ************
                            480 * UNE      *
                            481 ************************************
                            482 *  UNEXPECTED INTERRUPT            *
                            483 *                                  *
                            484 ************************************
                            485
                            0D95 486 UNE    EQU   *
   0D95 C0 87 021A          487        B     PRINT                  UNEXP INTERRUPT.
   0D99 C6                  0D99 488        DC    XL1'C6'
   0D9A 28                  0D9A 489        DC    AL1(MSG11-MSG11B)
   0D9B 11EA                0D9C 490        DC    AL2(MSG11)
   0D9D 4087                0D9E 491        DC    XL2'4087'
                            492
   0D9F C0 87 0222          493 HNI    B     HALT                   UNEXPECTED INTERRUPT.
   0DA3 4087                0DA4 494 HT87   DC    XL2'4087'
   0DA5 C0 87 0A35          495        B     BEG
                            496
                            496
                            496
                            496
                            496
                            497 ********************************
                            498 *      INTERRPUT ENABLING ROUTINE
                            499 *
                            500 ********************************
                            501
                            502 *  INTERRPUT FLAGS
                            503 *      EXPFLG
                            504 *      INTFLG
                            505 *
   0DA8 34 C8 0DC5          506 ENABLE ST    ENABLR+3,ARR           FOR RETURN
   0DAC 3D 40 0A00          507        CLI   X'A00',X'40'           ARE WE RELOCATED ?
```


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```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

   0DB1 F2 81 0E            508        JE    ENABLR                 IF NOT, DON'T ENABLE
   0DB4 3D C5 0200          509        CLI   SMOD,C'E'              ARE WE MODEL 15.
   0DB8 F2 01 07            510        JNE   ENABLR                 IF NOT, DON'T ENABLE
   0DBB 3C FF 1311          511        MVI   EXPFLG,X'FF'           SHOW INTERRUPT IS EXPECTED
   0DBF F3 40 02            512        SIO   SENAB,SCNTRL           ENABLE INTERRPUTS
   0DC2 C0 E7 0000          513 ENABLR B     *-*                    RETURN TO CALLER
                            514
                            515 ********************************
                            516 *      INTERRPUT HANDLING ROUTINE
                            517 *
                            518 ********************************
                            519
                            0DC6 520 IH     EQU   *
   0DC6 30 42 1348          521        SNS   SNS2I,SSTAT
   0DCA 3E 20 1347          522        TBN   SNS2I-1,X'20'          IS OUT INT PEND BIT ON ?
   0DCE CC 90 0A0E          523        BF    NOTME                  IF NOT, LEAVE.
   0DD2 3C FF 1311          524        CLI   EXPFLG,X'FF'           DID WE EXPECT THIS INTERRUPT ?
   0DD6 3C 00 1311          525        MVI   EXPFLG,X'00'           RESET EXPECT FLAG
   0DDA F2 81 04            526        JE    *+7
   0DDD 3C FF 1312          527        MVI   UNX,X'FF'              SHOW UNEXPECTED INTERRUPT
   0DE1 3C FF 131A          528        MVI   INTFLG,X'FF'           SHOW INTERRUPT DID OCCUR
   0DE5 C0 87 0A12          529        B     RESTOR
   0DE9 F3 40 05            530        SIO   SDISAB+SRESET,SCNTRL RESET INTERRUPT AND DISABLE
   0DEC C0 87 0A16          531        B     NXTINT                 GO TO SUPERVISOR IN CASE STILL IN INT
                            532
                            532
                            532
                            532
                            533 ************
                            534 *  DUMP1   *
                            535 *          *
                            536 ********************************************
                            537 * DUMPS CONTENTS OF BUFFER 1                *
                            538 *                                           *
                            539 ********************************************
   0DF0 34 08 0E13          540 DUMP1  ST    DUMP1R+3,ARR           FOR RETURN
   0DF4 C0 87 021E          541        B     UNPACK                 UNPACK FIRST  HALF OF 128 BYTE REC
   0DF8 40                  0DF8 542        DC    IL1'64'
   0DF9 0E9A                0DFA 543        DC    AL2(BUFF1+63)
   0DFB 08FF                0DFC 544        DC    XL2'8FF'               DCP BUFFER
   0DFD C0 87 021A          545        B     PRINT
   0E01 A1                  0E01 546        DC    XL1'A1'                FROM OWN BUFFER
                            547
   0EC2 C0 87 021E          548        B     UNPACK                 UNPACK SECOND HALF OF 128 BYTE REC
   0EC6 40                  0E05 549        DC    IL1'64'
   0EC7 0ECA                0E08 550        DC    AL2(BUFF1+127)
   0EC9 08FF                0E0A 551        DC    XL2'8FF'               DCP BUFFER
   0ECB C0 87 021A          552        B     PRINT
   0ECF A6                  0E0F 553        DC    XL1'A6'                FROM OWN BUFFER
   0E10 C0 87 0300          554 DUMP1R B     *-*                    RETURN TO CALLER
                            555
                            555
                            555
                            555
                            555
                            556 ************
                            557 *  DUMP2   *
                            558 *          *
                            559 ********************************************
                            560 * DUMPS CONTENTS OF BUFFER 2                *
                            561 *                                           *
                            562 ********************************************
   0E14 34 08 0E37          563 DUMP2  ST    DUMP2R+3,ARR           FOR RETURN
   0E18 C0 87 021E          564        B     UNPACK                 UNPACK FIRST  HALF OF 128 BYTE REC
   0E1C 40                  0E1C 565        DC    IL1'64'
   0E1D 0F1A                0E1E 566        DC    AL2(BUFF2+63)
   0E1F 08FF                0E20 567        DC    XL2'8FF'               DCP BUFFER
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    0E21 C0 87 021A            568         B     PRINT
    0E25 A1                0E25 569         DC    XL1'A1'          FROM OWN BUFFER
                               570
    0E26 C0 87 021E            571         B     UNPACK
    0E2A 40                0E2A 572         DC    IL1'64'          UNPACK SECOND HALF OF 128 BYTE REC
    0E2B 0F5A              0E2C 573         DC    AL2(BUFF2+127)
    0E2D 08FF              0E2E 574         DC    XL2'8FF'         DCP BUFFER
    0E2F C0 87 021A            575         B     PRINT
    0F32 A6                0E33 576         DC    XL1'A6'          FROM OWN BUFFER
    0E34 C0 87 0000            577 DUMP2R B     *-*              RETURN TO CALLER
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                               579 ********************************************************
                               580 *                                                      *
                               581 *          MESSAGES                                    *
                               582 *                                                      *
                               583 *                                                      *
                               584 *                                                      *
                               585 ********************************************************
    0E38 C960D640E3D9C1D5 0E5A 586 STATMG DC    CL35'I-O TRANSFER LINES -SENSE 3-   XXXX'
    0E40 E2C6C5D940D3C9D5      586
    0E48 C5E240C60E2C5D5E2     586
    0E50 C54CF360404040E7      586
    0E58 E7E7E7                586
                               587
                               587
                         0E5B  588 BUFF1  EQU   *
    0E5B                 0EDA  589        DS    CL128            READ BUFFER
                         0EDB  590 BUFF2  EQU   *
    0EDB                 0F5A  591        DS    CL120            READ BUFFER
    0F5B 40                    592        DC    CL1' '
                               593
    0F5C 0E5B            0F5D  594 BUFF1P DC    AL2(BUFF1)       LEFT END OF READ FIELD
                               595
                               595
                               595
    0F5E C1E3E3C1C3C8D4C5 0F71 596 STAB   DC    CL20'ATTACHMENT RST      '
    0F66 D5E34CD9E2E34040      596
    0F6E 40404040              596
    0F72 C5D5C440D6C640C4 0F85 597        DC    CL20'END OF DATA SET     '
    0F7A C1E3C140E2C5E340      597
    0F82 40404040              597
    0F86 F3F7F4F140C2E4E2 0F99 598        DC    CL20'3741 BUS IN PRTY ERR'
    0F8E 40C9D540D7D9E3E8      598
    0F96 40C5D5D9              598
    0F9A C5D5C440D6C640D9 0FAD 599        DC    CL20'END OF RECORD       '
    0FA2 C5C3D6D5C4404040      599
    0FAA 40404040              599
    0FAE C5D5C440D6C640D1 0FC1 600        DC    CL20'END OF JOB          '
    0FB6 D6C240404C404040      600
    0FBE 40404040              600
    0FC2 F3F7F4F140C1E3E3 0FD5 601        DC    CL20'3741 ATTENTION REQD '
    0FCA C5D5E3C9D6D540D9      601
    0FD2 C5D8C440              601
                               602
                         0FD5  603 MSG1B  EQU   *-1
    0FD6 60C9D5E7C5D9D9E4 0FFD 604 MSG1   DC    CL40'-INTERRUPT PENDING- BIT DID NOT COME ON '
    0FDE D7E340D7C5D5C4C9      604
    0FE6 D5C76040C2C9E340      604
    0FEE C4C9C440D5D6E340      604
    0FF6 C3D6D4C54CD6D5E4G     604
                         0FFD  605 MSG2B  EQU   *-1
    0FFE C9D5E3C5D9D9E4D7 1024 606        DC    CL39'INTERRUPT LEVEL 5 DID NOT OCCUR AFTER 7'
    100E E340D3C5E5C5D340      606
    1016 F540C4C9C440D5D6      606
    101E E340D6C3C3E4D940      606
    1025 40E2C5C3D6D5C4E2 104C 607 MSG2   DC    CL40' SECONDS.           '
    102D 4B4040404C404040      607
    103E 4040404040404040      607
    103D 40404C4040404040      607
    1045 40404C404C4C4040      607
                         104C  608 MSG3B  EQU   *-1
    104D 4C404C4040      1051  609 MSG3A  DC    CL5'   '
    1052 40D4D6C4C540D6D5 1079 610 MSG3   DC    CL40' MODE ONLY EXPECTED ON.'
    105A D3E840C5E7D7C5C3      610
    1062 E3C5C440D6D54840      610
    106A 4040404040404040      610
    1072 4040404040404040      610
                         1079  611 MSG4B  EQU   *-1
```

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```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
    107A D5C5C1C440D4D6C4 10A1  612 MSG4   DC    CL40'READ MODE FOUND ON.                 '
    1082 C540C6D6E4D5C440       612
    108A D6D54B404C404040       612
    1092 4040404040404040       612
    109A 40404C4040404040       612
                          10A1  613 MSG5B  EQU   *-1
    10A2 E6D9C9E3C540D4D6 10C9  614 MSG5   DC    CL40'WRITE MODE FOUND ON.                '
    10AA C4C5E4CC6D6E4D5C4      614
    10B2 40D6D5E4B4C404040      614
    10BA 40404C4040404040       614
    10C2 4040404040404040       614
                          10C9  615 MSG6B  EQU   *-1
    10CA E2C5D640D5D660D6 10F1  616 MSG6   DC    CL40'SIO NO-OP.                          '
    10D2 D74B4040404040404      616
    10DA 4040404C4C404040       616
    10E2 40404C4040404040       616
    10EA 4C4040404C404040       616
                          10F1  617 MSG7B  EQU   *-1
    10F2 C4C1E3C140E3D9C1 1118  618         DC    CL39'DATA TRANSFER REGISTER PARITY ERROR.  '
    10FA D5E2C6C5D5C4D9C5       618
    1102 C7C9E2E3C5D9C4D7       618
    110A C1D9C9E3E840C5D9       618
    1112 D5D6D54B4C4C40         618
    1119 4040D5D6E3C56040 1140  619 MSG7   DC    CL40'  NOTE- 3741 RECORDS MUST BE 128 BYTES. '
    1121 F3F7F4F140D9C5C3       619
    1129 D6D5C4E240D4E4E2       619
    1131 E340C2C540F1F2F8       619
    1139 40C2E8E3C5E24B40       619
                          1140  620 MSG8B  EQU   *-1
    1141 C2D6E3C840D9C5C1 1168  621 MSG8   DC    CL40'BOTH READ AND WRITE MODE WERE ON.    '
    1149 C440C1D5C440E6D9       621
    1151 C9E3C540D4D6C4C5       621
    1159 40E6C5D9C540D6D5       621
    1161 4B4040404C404040       621
                          1168  622 MSG9B  EQU   *-1
    1169 D3C5D5C7E3C840C3 118F  623         DC    CL39'LENGTH COUNT REGISTER ERROR. EXPECTED '
    1171 D6E4D5E340D9C5C7       623
    1179 C9E2E3C5D540C5D9       623
    1181 D5D6D54B40C5E7D7       623
    1189 C5C3E3C5C44040         623
    1190 C6C6E840C6D6E4D5 1198  624 MSG9    DC    CL12'FF. FOUND XX'
    1198 C440E7E7               624
                          1198  625 MSG10B EQU   *-1
    119C F3F7F4F140C2E4E2 11C2  626 MSG10  DC    CL39'3741 BUSY TOO LONG.                 '
    11A4 E840E3D6D640D3D6       626
    11AC D5C74B4040404040       626
    11B4 4C4040404C404C40       626
    11BC 4040404040404040       626
                          11C2  627 MSG11B EQU   *-1
    11C3 E4D5C5E7D7C5C3E3 11EA  628 MSG11  DC    CL40'UNEXPECTED INTERRUPT.                '
    11CB C5C440C9D5E3C5D9       628
    11D3 D5E4D7E34B4C4040       628
    11DB 4040404040404040       628
    11E3 40404C4040404040       628
                          11EA  629 MSG12B EQU   *-1
    11EB 60C5D5C440D6C640 1212  630 MSG12  DC    CL40'-ENC OF JOB- LINE NOT UP             '
    11F3 D1D6C26040D3C9D5       630
    11FB C540D5D6E340E4D7       630
    1203 4040404040404040       630
    120B 40404C4040404040       630
                          1212  631 MSG13B EQU   *-1
    1213 D5C5C1C440D4D6C4 1239  632         DC    CL39'READ MODE AND WRITE MODE BOTH OFF.  '
    121B C540C1D5C440E6D9       632
    1223 C5E3C540D4D6C4C5       632
    122B 40C2D6E3C840D6C6       632
    1233 C64B40404C4040         632
    123A E2D5E240F3406040 1245  633 MSG13  DC    CL12'SNS 3 - XXXX'
    1242 E7E7E7E7               633
```


40F1 3741 SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                          1245  634 MSG14B EQU   *-1
    124E C1E3E3C5D5E3C9D6 126C  635         DC    CL39'ATTENTION REQUIRED -   IF 3741 DISPLAYS'
    124E D540C9C5D8E4C9D9       635
    125E C5C44C6C4C4040C9       635
    125E C640F3F7F4F140C4       635
    1266 C5E2D7D3C1E8E2         635
    126D 4060F1F0C5F1E040 1294  636         DC    CL40' -10E1- ERROR. THEN THIS IS NOT A 3741 '
    1275 C5D9D9D6D5E6B40E3      636
    127D C6C5D540E3C8C9E2       636
    1285 4CC9E240D5D6E340       636
    128D C140F3F7F4F14040       636
    1295 C6C1C9D3E4D9C54B 12A0  637 MSG14  DC    CL12'FAILURE.    '
    129D 40404040               637
                          12A0  638 MSG15B EQU   *-1
    12A1 E2D7C1C3C540C1E5 12C7  639         DC    CL39'SPACE AVAILABLE ON 3741 WAS USED UP.  '
    12A9 C1C9D3C1C2D3C540       639
    12B1 D6D5E40F3F7F4F140      639
    12B9 E6C1F240E4E2C5C4       639
    12C1 40E4D74B404040         639
    12C8 D9C5E2C5E340E2E8 12EF  640         DC    CL40'RESET SYSTEM/3 HALT. RESTART 3741.  '
    12D0 E2E3C5D461F340C8       640
    12D8 C1D3E36B40D9C5E2       640
    12E0 E3C1D9E340F3F7F4       640
    12E8 F14B4040404040404      640
    12F0 4040404040404040 12FD  641 MSG15  DC    CL12'            '
    12F8 40404040               641
    12FC 40D9C5C1C4       1300  642 CREAD  DC    CL5'READ'
    1301 E6D9C9E3C5       1305  643 CWRITE DC    CL5'WRITE'
                                644 ************************************************
                                645 *                                              *
                                646 *                                              *
                                647 *         DC'S                                 *
                                648 *                                              *
                                649 *                                              *
                                650 *                                              *
                                651 ************************************************
                                652
    1306 0000                   653 S       DC    XL2'0000'      *     CONTAINS SWITCHES AS SENSED
    1308 00                     654 S1      DC    XL1'00'        *                 *
    1309 00                     655 S2      DC    XL1'00'        * KEEP TOGETHER AND LENGTH 6
    130A 00                     656 S3      DC    XL1'00'        *                 *
    130B 00                     657 S4      DC    XL1'00'        *
    130C 0001                   658 ONE     DC    XL2'0001'
    130E 0002                   659 TWO     DC    XL2'0002'
    1310 55                     660 INCVAL  DC    TL1'85'              BUMPS 'CHAR'
    1311 00                     661 EXPFLG  DC    XL1'00'
    1312 00                     662 UNX     DC    XL1'00'
    1313 0000                   663 PSRSAV  DC    XL2'0000'
    1315 0000                   664 PIARSV  DC    XL2'0000'
    1317 0D95                   665 UNE8    DC    AL2(UNE)       ADDRESS OF FORCED HALT DUE TO UNEXP INT
    1319 00                     666 CHAR    DC    AL1(*-*)
    131A CC                     667 INTFLG  DC    AL1(*-*)
    131B 00                     668 RECCTR  DC    AL1(*-*)
    131C F0F0                   669 CTBUF   DC    XL2'F0F0'
    131E F0F0                   670 Z0      DC    XL2'F0F0'
    1320 F0F1                   671 Z1      DC    XL2'F0F1'
    1322 F0F2                   672 Z2      DC    XL2'F0F2'
    1324 0000                   673 CTR     DC    XL2'0000'
    1326 F0F0F0F0F0F1           674 NUMONE  DC    XL6'F0F0F0F0F0F1'
    1328 0000000000             675 SEQ     DC    XL5'0000000000'
    1330 00                     676 QWORK   DC    XL1'00'
    1331 0000                   677 WORK    DC    XL2'0'
    1333 0000                   678         DC    XL2'0'
    1335 007F                   679 LENGTH  DC    XL2'007F'      255-L     (EG. 255-128 = 127 = X'7F')
    1337 0000                   680 X0000   DC    XL2'0000'
    1339 4000                   681 FUNBIT  DC    XL2'4000'      E8-1 BIT 0 =6 USEC PULSES
    1338 0000                   682 SNS1    DC    XL2'0000'
    133C 0000                   683 SNS2    DC    XL2'0000'
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    133F 0000            1340  684 SNS3    DC     XL2'0000'
    1341 0000            1342  685 SNS4    DC     XL2'0000'
    1343 0000            1344  686 SNS5    DC     XL2'0000'
    1345 0000            1346  687 SENS    DC     XL2'0000'
    1347 C000            1348  688 SNS2I   DC     XL2'0000'
                               689 ********************************************************************************
                               690 *                                                                              *
                               691 *       EQLATES                                                                *
                               692 *                                                                              *
                               693 *                                                                              *
                               694 *                                                                              *
                               695 ********************************************************************************
                               696
                               697 ***********************************
                               698 *       STANDARD DCP  EQUATES     *
                               699 ***********************************
0222                           700 HALT    EQU    X'222'
0216                           701 LINK    EQU    X'216'
021A                           702 PRINT   EQU    X'21A'
0212                           703 TEST    EQU    X'212'
021E                           704 UNPACK  EQU    X'21E'
0020                           705 PIAR    EQU    X'20'          PROGRAM INSTRUCTION ADDRESS REGISTER
0200                           706 SMOD    EQU    X'200'         LOCATION OF CPU MODEL LETTER.
0001                           707 XR1     EQU    01
0002                           708 XR2     EQU    02
0008                           709 ARR     EQU    X'C8'
0004                           710 PSR     EQU    X'04'
00C0                           711 IAR1    EQU    X'C0'
0084                           712 IAR5    EQU    X'E4'
0020                           713 PIIAR   EQU    X'20'
0226                           714 PACK    EQU    X'226'
022A                           715 LOAD    EQU    X'22A'
0080                           716 BIT0    EQU    X'80'
0040                           717 BIT1    EQU    X'40'
0020                           718 BIT2    EQU    X'20'
0010                           719 BIT3    EQU    X'10'
0008                           720 BIT4    EQU    X'C8'
0004                           721 BIT5    EQU    X'04'
0002                           722 BIT6    EQU    X'02'
0001                           723 BIT7    EQU    X'01'
0208                           724 SBYTE0  EQU    X'0208'
020A                           725 SBYTE2  EQU    X'020A'        SENSE SWITCH BYTE 2
0208                           726 SBYTE3  EQU    X'020B'        SENSE SWITCH BYTE 3
0020                           727 SSW02   EQU    X'20'          MANUAL INTERVENTION
0008                           728 SSW04   EQU    X'C8'          BYPASS NON-ERROR PRINTING (DCP)
0001                           729 SSW07   EQU    X'01'          LOAD AND GO (DCP)
0080                           730 SSW10   EQU    X'80'
0040                           731 SSW11   EQU    X'40'
0020                           732 SSW12   EQU    X'20'
0010                           733 SSW13   EQU    X'10'
0008                           734 SSW14   EQU    X'C8'
0004                           735 SSW15   EQU    X'04'
0002                           736 SSW16   EQU    X'02'
0001                           737 SSW17   EQU    X'01'
0080                           738 SSW18   EQU    X'80'
0040                           739 SSW19   EQU    X'40'
0020                           740 SSW1A   EQU    X'20'
0001                           741 SSW2F   EQU    X'01'
                               742
0A0A                           743 ENTRY   EQU    X'A0A'         |
0A0E                           744 NOTME   EQU    X'A0E'         |  SUPERVISOR LINKAGE
0A12                           745 RESTOR  EQU    X'A12'         |
0A16                           746 NXTINT  EQU    X'A16'         |
                               747
0D14                           748 SLEN    EQU    20
                               749
                               750 ********************************************
                               751 *       EQUATE USE FOR PROGRAM CODING      *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               752 ********************************************
0003                           753 H1      EQU    X'C3'
0071                           754 H2      EQU    X'71'
003C                           755 HF      EQU    X'3C'
007C                           756 HE      EQU    X'7C'
0068                           757 HL      EQU    X'68'
006F                           758 H0      EQU    X'6F'
0076                           759 H2      EQU    X'76'
0057                           760 H3      EQU    X'57'
001B                           761 H4      EQU    X'1B'
005D                           762 H5      EQU    X'5D'
007D                           763 H6      EQU    X'7D'
0007                           764 H7      EQU    X'C7'
007F                           765 H8      EQU    X'7F'
005F                           766 H9      EQU    X'5F'
003F                           767 HA      EQU    X'3F'
0079                           768 HB      EQU    X'79'
006C                           769 HC      EQU    X'6C'
0073                           770 HD      EQU    X'73'
0004                           771 HUP     EQU    X'04'
0040                           772 HDN     EQU    X'40'
                               773 ****************************
                               774 *
                               775 *  EQUATES FOR 3741
                               776 *
                               777 ****************************
                               778
                               779 * TIO
                               780
0040                           781 TNR     EQU    X'40'          TIO NOT READY OR ERROR
0042                           782 TBSY    EQU    X'42'          TIO FOR BUSY
                               783
                               784 * LIO.
                               785
0041                           786 LFUNC   EQU    X'41'          LIO FUNCTION REGISTER
0042                           787 LLCR    EQU    X'42'          LIO LENGTH COUNT REGISTER
0044                           788 LDAR    EQU    X'44'          LIO DATA ADDRESS REGISTER
0045                           789 LDTR    EQU    X'45'          LIO DATA TRANSFER REGISTER
                               790
                               791 * SIO
                               792
0040                           793 SCNTRL  EQU    X'40'          SIO CONTROL INTERRUPT STATUS
0041                           794 SREAD   EQU    X'41'          SIO READ
0042                           795 SWRITE  EQU    X'42'          SIO WRITE
0043                           796 SCTL1   EQU    X'43'          SIO I/O CONTROL 1
0044                           797 SCTL2   EQU    X'44'          SIO I/O CONTROL 2
                               798
                               799 * SNS
                               800
0041                           801 SFUNR   EQU    X'41'          SNS FUNCTION REGISTER
0042                           802 SSTAT   EQU    X'42'          SNS CCR + STATUS     (STAT=EB2)
0043                           803 SLINES  EQU    X'43'          SNS I/O TRANSFER LINES
0044                           804 SDAR    EQU    X'44'          SNS DATA ADDRESS REGISTER (DAR)
0045                           805 SDXFR   EQU    X'45'          SNS DATA TRANSFER + DIAG   (DIAG=EB2)
                               806
                               807 * R-BYTES FOR SIO 0
                               808
                               809 *                        BIT
0001                           810 SRESET  EQU    X'01'    7     SIO I-R  RESET INTERRUPT
0002                           811 SENAB   EQU    X'02'    6     SIO I-R  ENABLE INTERRUPTS
0004                           812 SDISAB  EQU    X'04'    5     SIO I-R  DISABLE INTERRUPTS
0008                           813 SNOBSY  EQU    X'08'    4     SIO I-R  FORCE NOT BUSY
0010                           814 SUPINT  EQU    X'10'    3     SIO I-R  SET INTERRUPT REQUEST
                               815
                               815
                               816 * ERROR MASKS SNS-3
                               817
                               818 *
```

```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

                        0040  819 EDS     EQU   X'40'          END OF DATA SET
                        0020  820 BIPE    EQU   X'20'          BUSS IN PARITY ERROR
                        0010  821 EOR     EQU   X'10'          END OF RECORD
                        0008  822 EOJ     EQU   X'08'          END OF JOB
                        0004  823 AT      EQU   X'04'          3741 ATTENTION
                              824 *
                              825
                              826 *                    I/C SELECT
                              827 *                      LINE #      MEANING
                              828 *                        1,2
                        0004  829 RSU     EQU   X'04'    3     NOT USED
                        0008  830 RE      EQU   X'08'    4     SET UP ERROR (READ VS. WRITE MODE)
                        0010  831 RSR     EQU   X'10'    5     RESPONSE
                        0020  832 REOD    EQU   X'20'    6     SENSE RESPONSE
                        0040  833 REOJ    EQU   X'40'    7     END OF DATA SET
                        0080  834 BOPE    EQU   X'80'    8     END OF JOB
                        FFFF  835         END                  BUS OUT PARITY ERROR
```


CROSS-REFERENCE

```
SYMBOL  T LEN VALUE  DEFN   REFERENCES
ACK     A 004 0B66   0193   0169
ARR     C 001 0002   0769   0090  0206  0272  0304  0337  0361  0379  0410  0506  0540  0563
AT      C 001 0004   0823   0058  0097  0166  0242
BEG     A 003 0A35   0054   0147  0161  0187  0264  0286  0369  0401  0449  0475  0495
BIPE    C 001 0020   0820   0058  0097  0166
BIT0    C 001 0080   0716
BIT1    C 001 0040   0717
BIT2    C 001 0020   0718
BIT3    C 001 0010   0719
BIT4    C 001 0008   0720
BIT5    C 001 0004   0721
BIT6    C 001 0002   0722
BIT7    C 001 0001   0723
BOPE    C 001 0080   0834   0153
BUFF1   A 001 0E58   0588   0073* 0543  0550  0594
BUFF1B  A 002 0F5D   0594   0116
BUFF2   A 001 0EDB   0590   0047* 0048  0048* 0050* 0073  0347* 0348  0348* 0350* 0566  0573
CHAR    A 001 1319   0666   0046* 0047  0338  0340* 0343* 0345* 0347
CHGBUF  A 004 0C78   0237   0075
CHGBUR  A 004 0CAF   0352   0337*
CHG1    A 001 0C8A   0342   0339
CREAD   A 005 1300   0642
CTBUF   A 002 131D   0665
CTR     A 002 1325   0673
CWRITE  A 005 1305   0642
DCSIO   A 003 0AC2   0120   0107* 0111* 0244
DUMP1   A 004 0DFC   0540
DUMP1R  A 004 0E10   0554   0540*
DUMP2   A 004 0E14   0863
DUMP2R  A 004 0E34   0577   0563*
EDS     C 001 0040   0819   0058  0097  0166
ENABLE  A 004 0DA9   0506   0117  0193
ENABLR  A 004 0DC2   0513   0506* 0508  0510
ENTRY   C 001 0A0A   0743   0382
EOJ     C 001 0008   0822   0058  0097  0166  0210  0211
EOR     C 001 0010   0821   0058  0097
EXPFLG  A 001 1311   0661   0511* 0524  0526*
FUNBIT  A 002 133A   0681   0038
GETINT  A 004 0CF6   0410   0092  0130
GETR    A 004 0D91   0476   0410* 0439
HA      C 001 003F   0767
HALT    C 001 0222   0700   0145  0159  0185  0262  0284  0367  0399  0447  0473  0493
HB      C 001 0079   0768
HC      C 001 006C   0769
HD      C 001 0073   0770
HDN     C 001 0040   0772
HE      C 001 007C   0756
HF      C 001 003C   0755
HGRDY   A 001 0A38   0055   0061  0214
HL      C 001 0068   0757
HLTAT   A 004 0BE9   0262   0254
HNGINT  A 004 0D2F   0432   0417  0436
HNGFND  A 004 000C   0420   0415  0427
HNI     A 004 CD9F   0453
HT8C    A 002 0C13   0285
HT8E    A 002 0CC6   0368
HT80    A 002 0D5A   0446
HT81    A 002 0B22   0160
HT82    A 002 3BC4   0146
HT83    A 002 0BEE   0263
HT84    A 002 0D8C   0474
HT86    A 002 0CF1   0400
HT87    A 002 0DA4   0454
HT8E    A 002 0861   0186
HUP     C 001 0004   0771
HZ      C 001 0071   0754
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
HC	C	001	006F	0758	
H1	C	001	0003	0753	
H2	C	001	0076	0759	
H3	C	001	0057	0760	
H4	C	001	001B	0761	
H5	C	001	005D	0762	
H6	C	001	007D	0763	
H7	C	001	00C7	0764	
H8	C	001	007F	0765	
H9	C	001	005F	0766	
IAR1	C	001	00CC	0711	
IARS	C	001	0084	0712	
IGA	A	004	0A50	0063	0059
IGB	A	003	CA79	0051	0063* 0095*
IGC	A	004	0AB4	0095	0091
IH	A	001	0DC6	0520	0016
INCVAL	A	001	1310	0660	0343
INTFLG	A	001	131A	0667	0039* 0432 0438* 0528*
INTOC	A	003	0D29	0428	0424
ISBSY	A	004	0AD0	0125	0123
LDAR	C	001	0044	0788	0116*
LDTR	C	001	0045	0789	
LENGTH	A	002	133E	0679	0115
LFUNC	C	001	0041	0786	0038*
LINK	C	001	0216	C7C1	
LLCR	C	001	0042	0787	0115*
LOAD	C	001	022A	0715	
MCDEOK	A	001	0AB3	0113	0110
MSG1	A	040	0FFD	0604	0462 0463
MSG1B	A	001	0FD5	0603	0462
MSG10	A	039	11C2	0626	0364 0365
MSG10B	A	001	1198	0625	0364
MSG11	A	040	11EA	0628	0489 0490
MSG11B	A	001	11C2	0627	0489
MSG12	A	040	1212	0630	
MSG12B	A	001	11EA	0629	
MSG13	A	012	1245	0633	0277 0281 0282
MSG13B	A	001	1212	0631	0281
MSG14	A	012	12A0	0637	0248 0249
MSG14B	A	001	1245	0634	0248
MSG15	A	012	12FB	0641	0252 0253
MSG15B	A	001	12A0	0638	0252
MSG2	A	040	104C	0607	0469 0470
MSG2B	A	001	0FFD	0605	0469
MSG3	A	040	1079	0610	
MSG3A	A	005	1051	0609	
MSG3B	A	001	104C	0608	
MSG4	A	040	10A1	0612	
MSG4B	A	001	1079	0611	
MSG5	A	040	10C9	0614	
MSG5B	A	001	10A1	0613	
MSG6	A	040	10F1	0616	0142 0143
MSG6B	A	001	10C9	0615	0142
MSG7	A	040	1140	0619	0156 0157
MSG7B	A	001	10F1	0617	0156
MSG8	A	040	1168	0621	0395 0396
MSG8B	A	001	1140	0620	0395
MSG9	A	012	1198	0624	0178 0182 0183
MSG9B	A	001	1168	0622	0182
NCDTPE	A	001	0827	0165	0152
NCIERR	A	004	0D4A	0444	0426 0435
NCIHT	A	004	0D87	0473	0465
NCINT	A	004	0D7D	04E7	0457
NCMCDE	A	001	0BF7	0271	0101
NCMCDR	A	004	0C18	0288	0272*
NCOPOK	A	004	0B09	0151	0138

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
NOPND	A	004	CD70	046C	0454 0456
NCRAP	A	001	0C97	0346	0341 0344
NOTAT	A	001	0BE1	0255	0243 0245
NOTME	C	001	0A0E	0744	0523
NUMCNE	A	005	132A	0674	0049 0349
NXTINT	C	001	0A1E	0746	0531
OLDSEC	A	006	0C3D	0311	0307
ONE	A	002	130D	0658	
ONLN	A	001	0D5F	0451	0446
PB	A	002	0BE8	0260	0240*
PACK	C	001	0226	0714	
PEND	A	004	0D42	0438	0429 0433
PIAR	C	001	0020	0705	
PIARSV	A	002	1316	0664	
PRINT	C	001	021A	0702	0140 0154 0180 0223 0245 0250 0257 0279 0362 0393 0460 0467 0487 0345 0552 0568 0575
PSR	C	001	0004	0710	
PSRSAV	A	002	1314	0663	
P1IAR	C	001	0020	0713	
QWORK	A	001	1330	0676	
RE	C	001	0008	0730	0114 0194 0213 0217
RECCTR	A	001	131B	0666	
REOD	C	001	0020	0834	
REOJ	C	001	0040	0833	0139
RESTOR	C	001	0A12	0745	0529
RSR	C	001	0010	0831	0139 0153 0174
RSU	C	001	0004	0829	
RTN01	A	001	0ADD	0029	0017
RW	A	004	0A75	0093	0074
PWR	A	004	0B6D	0195	0090*
S	A	002	1307	0653	
SBYTE0	C	001	0208	0724	
SBYTE2	C	001	020A	0725	
SBYTE3	C	001	020B	0726	
SCNTRL	C	001	0040	0793	0054 0065 0428 0512 0530
SCTL1	C	001	0043	0756	0114 0139 0153 0174 0194 0213 0217
SCTL2	C	001	0044	0797	
SDAR	C	001	0C44	0804	
SDISAB	C	001	0004	0812	0054 0530
SDXFR	C	001	0045	0805	
SENAB	C	001	0002	0811	0512
SENS	A	002	1346	0667	
SEQ	A	005	132F	0675	0049* 0050 0349* 0350
SETPT	A	001	0BBC	0239	0236
SFUNR	C	001	0041	0801	
SLEN	C	001	0014	0748	0237 0259
SLINES	C	001	0043	0803	0056 0094 0132 0444
SMOD	C	001	0200	0706	0416 0455 0509
SNOBSY	C	001	000E	0813	
SNOTBY	A	001	0ADC	0128	0124
SNS1	A	002	133C	0662	
SNS2	A	002	133E	0663	0133* 0137 0151 0168 0177 0420* 0421 0423
SNS2I	A	002	1348	0668	0133 0421* 0521* 0522
SNS3	A	002	1340	0664	0056* 0057 0058 0094* 0097 0100 0102 0108 0109 0132* 0166 0210 0211 0221 0234 0242 0276 0444* 0445
SNS4	A	002	1342	0665	
SNS5	A	002	1344	0666	
SPLCOP	A	006	0BA6	0235	0238
SREAD	C	001	0041	0794	0111
SRESET	C	001	0001	0810	0065 0428 0530
SSTAT	C	001	0042	0802	0420 0521
SSW02	C	001	0020	0727	
SSW04	C	001	0008	0728	
SSW07	C	001	0001	0729	
SSW1A	C	001	0020	0740	
SSW10	C	001	0080	0730	

40F1   3741 SYSTEM TEST MODULE

CROSS-REFERENCE

```
SYMBOL T LEN VALUE  DEFN    REFERENCES

SSW11  C 001  0040  0731
SSW12  C 001  0020  0732
SSW13  C 001  0010  0733
SSW14  C 001  0008  0734
SSW15  C 001  0004  0735
SSW16  C 001  0002  0736
SSW17  C 001  0001  0737
SSW18  C 001  0080  0738
SSW19  C 001  0040  0739
SSW2F  C 001  0001  0741
STAE   A 020  0F71  0596    0233
STATER A 001  0B71  0205    0098  0167
STATMG A 035  0E5A  0586    0222  0226
STATRR A 004  0BF3  0266    0206*
STAT1  A 001  0B87  0216    0212
SUP    A 004  0CCF  0379    0060  0305
SUPINT C 001  0010  0814
SUPR   A 004  0CDE  0384    0379* 0381
SWRITE C 001  0042  0795    0107  0244
S1     A 001  1308  0654
S2     A 001  1309  0655
S3     A 001  130A  0656
S4     A 001  130B  0657
TESY   C 001  0042  0782    0123
TEST   C 001  0212  0703
TNR    C 001  0040  0781
TCMCDE A 004  0CE2  0393    0103
TCOBSR A 004  0CCB  0370    0361*
TCOBSY A 004  0CB3  0361    0126
TWO    A 002  130F  0659
UCT1   A 003  0A0C  0019
UNE    A 001  0D55  0486    0077  0665
UNE8   A 002  1318  0665
UNPACK C 001  021E  0704    0175  0219  0274  0541  0548  0564  0571
UNX    A 001  1312  0662    0076  0527*
WAIT   A 001  0C1C  0303    0125  0171  0425  0434
WAITBY A 004  0AC9  0123    0127
WAITR  A 004  0C68  0319    0304* 0317  0318*
WAITRN A 006  0C62  0318    0314
WCNT   A 002  0C6D  0321    0310* 0313* 0315*
WLOOP  A 001  0A57  0072    0078
WORK   A 002  1332  0677    0234* 0235  0235*
WSEC   A 002  0C6F  0322    0122* 0170* 0306  0308  0309  0309* 0411*
WSECA  A 002  0C71  0323    0308* 0316*
W0001  A 002  0C75  0325    0313  0316
W0004  A 002  0C77  0326    0318
W1     A 004  0B3A  0171    0173
W1000  A 002  0C73  0324    0310  0315
XR1    C 001  0001  0707    0233* 0237  0237* 0240
XR2    C 001  0002  0708
X0000  A 002  133E  0680
X40F   A 001  0000  0005
Z0     A 002  131F  0670
Z1     A 002  1321  0671
Z2     A 002  1323  0672

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY =            0
```


40F1   3741 SYSTEM TEST MODULE

OBJECT CARD LISTING

THE CHARACTER • INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

 GBK GBD   PN 55  58777 EC 824870  40F - 3741 SYS T  EST MOD           84@@84@@   400A0  0        40F10000
T.OY?&|E  &7FB-4   DA&  F ""&1&J<  :|  LFT1ND1U<  '  ED1U<¬-'RC5Y<AA<  ?D2Y< B&%HBQSHAO  QE *E=8U40F10001
T.-Z;A @-D2"3& &  0&1( +&<L|3X@D4C  U Z&OH*<3@BGB1-  @/02:@4 ACG@+6-'  EOH*  BODH1@$E1<  |BO&B)1D40F10002
T.-D(BXP /018|¬@  LD%BACRP /0ZPOH*  H)L&HB7C2A0T /C3  &<D<L&COGBXY9"A(   0I   BOYIB REJD  (B&MA78<40F10003
T.OD'B7D9 1<"0A   .'3-CD3" D 3S|DH  H03-AD3@9 /<"@/   D|DDHO"(CBCEBD3Q  1J ') B@.IA4REJD  (B&MA:.440F10004
T.0._0H*(D¬<  CO  BCF"A&-.&@Y*<GH*  <G<BGC.| /C.IOH*  <'TACD4 < J<=D4-  8AA<' B@.HKM/GJU  NC-YC13*40F10005
T(&XTOI .B¬(CM<B  G /.FHAC1&H. /OH  S&H. /OY5+ -L|¬H  &E"(CU<BG /.FL1E   &HG /OHS&HG  B0  ;F-BC91H40F10006
T< _M/OY5+;0L&<B  &B7D'"1<=@YD0| D  <$@BGCA3 /0_FOH*  .+?(CD<BG /8AD38  J#@BG - _H2D)FJM  +B-QB3D840F10007
T<O>HF%G3DR_ S<B  G SI S<BGBTP /06  Z@4<HOH*  C&HB"Q  8EA( +¬*L&|H&A"(  CB<BGBTT3&0 1I2<  ¬EA DM3%40F10008
T< >9B<BGB8# /OH  ; /( CV. /OHEOS<  +OUBCO-D|*&0AD3H  L& 8 D3HL<%B-B#3  K JL /0 .I2M/G1%  NC&%DQ.Y40F10009
T( ?>B:%4 &?Y+ &  L&|H&FTSBB%|2 J|   /OHE-N%KY<BG /D  FC1.#@Y*HOH*BFYQ  M  C /OHS&H< H1%  &B&MA7Q<40F10010
T<-C/OH*H(*BG       4B 0$OH*BG-HL&AI  EOH*BF%G3DUN T<B  G SI T<BGBTP /0    ( -<E@BG    OHA0  MD-%C:2840F10011
T. 1+C<@'  1?@YD  KC D<*&1?COD<$01  ?C D<$&13C¬8<|&0  'CL%<&01CCOD<$&1  5 BODIS&-G/YQEAH  +C MA:JY40F10012
T<&2 @-D&C D<$&1  3COD<*&150HD<E 8  ACF%<)@BG                C:  A  &4B 2  2|&DLF¬H <BOQE/H  +C -FOK-40F10013
T.-2? &*@ A<R@Y*  (C- LFJ<&@S D| D  LF&0 C5YLF&1=C5U  |0-GDD2@LH-DDC>H  L.@   .K%XIKD¬F1U  NC-0E@--40F10014
T(-3W/0  ( -<3%B  G /.BI1GB&H# /OH  S&H# /OY50H*  C&  HC+D'& Y @YDDOH*  HB%PG  C /OHE1-   SF-8F"L 40F10015
T<-4RHAEY&H$ /OH  S&H$ /OY5( -(VCO  GCF@'& Y &YDG|*M  E |HAH3ABD38< J(  HD388HA<' CH>.B-  OD-8B8JU40F10016
T<&5.@/ <OH*<G<B  GCM. /04<@4 A@Y*  L|¬@LF?HAC<BGCA3   /05HOH*(.30 D1.   /06J<D<..2%XH1@  QC-YF9QQ40F10017
T(-6BD4 8AA<"@/   HOH*BHUB OH*H(L5   B-C2-&Y'1&H @-D  C@Y*(OH*BF%QYC"5   /|HGB%BG /.FL0   .D-MA@/Y40F10018
T(&6BCD1 /<BG SI   /<BGBTP /0  OH*  BF%QYD:Z /@BG SI   /&BGBTM4B 7E|M   H |HACT7E -C2 BU  VF&4A"2Y40F10019
T<O7% &*2"1<J&4   BOH*  CABD4-8HA(  GOI HCT7"D1D@ A<  J@YDD||@LDT3"D1.   /OYK@4 E0   .I2   *EA E;3*40F10020
```

40F1 3741 SYSTEM TEST MODULE

OBJECT CARD LISTING

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

T(&8S/0YO( -+D@B  G /9 CZYH"@BG /D  /0H*BGU +6-T"0H*  BFD$ /0  ( -+(@B  G /9 C1YH"@BG CD  DF04F##440F10021

T(09E /D/0H*BGU   |O-T"0H*BFD$ /0   2OCO&+|R0)PS1%P  R&(|I5*PS&FCS1)P  S1MC3QDA &+¬X9=*      I$ @40F10022

T+&=M& 9$C;|T0*|  H5<PN84CR8>( &DA  &DCE5*J 5%R 1<G  T0MCS1;( &DA &||  7'|E 0>LS&<XN&(¬  R80 BLRD40F10023

T+-"|:DCE6)XE5*J   5%R 6*PC5_XD&DA  &DA &<FN1DCO1UC  J5%I &DA &DA &DA  @"¬4@MCA8=|E5;|  I5_M :T440F10024

T+/ H&(XE6<J Q<X  N8@PR6;LP84CP1)P  C2)PGQDCB2;( 1<X  D&(FC84CC5_LE&($  N&<XN8@PR6;LP84C  L1;M EJ*40F10025

T+/AE1)( 'MCD2*J   5)$T&($C0=LR&<G  F8@PR&|) 8%PC5_P  D8U_ &DA &DA &DA  &DA &DA &DA &DA  &D  *8<40F10026

T+/B &DA &DA &DA   &DA &(LO1<N 5_P  L:DCE9'¬E0=|E1DC  O5N_ &DA &DA &DA  &DA &DA &(XE0*J  5(Q &S@40F10027

T+/B#1<N 1_DU5*J   5_N.&DA &DA &DA  &DA &DA &DA &DA  9_XI8@N 5($D1MC  F5>LN1DCO5M_ &DA  &D  3C040F10028

T+/C6&DA &DA &DA   &DA &DCS2)R 5)R  -5_).&DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA 1<G  T0M  P3@40F10029

T+/D18'XA5;.F1)V   6*PG2;.T1)V 5&G  R2;|Y&<PR6)$RK4A  &DA 5)$T1DA @"¬  4@MCR1*|O6*LS&(L  U8>< $3%40F10030

T+/E%&<.E&|G2=DC  B:+|E8U_ 0_$T2DC  R1*GD&<GN1DCW6*X  T1MCM5%LE&+$E6*N  5_N.&DA &DA &(|  E5** &E-40F10031

T+/FX8&/ 0'$U5;(   6*PG2;.T1)V 1)X  R5_V.&<PX5@PC8&F  D&DCF1W_ 1_$U5*J  9=¬3'"L1&<.U8>/  8'Q M2Y40F10032

T+/GS5UCL5_PGK4A   &DA &DA &DA &DA  &DA &DA 9(PE9'¬  E0=|E1DCI5;|E6)X  U5=(.&DA &DA &DA  &D  :J%40F10033

T+/H)&DA &DA &DA  -1)PD&($F&(GO0WA  4@XN1MCN5>( 9()  &DA &DA &DA &DA  &DA 6*PA1DCM5%L  E&<D &Z&40F10034

T+/IO5*J 9_XI8@N   5($D1MCB5>|H&($  F1U_ &DA &+.N8UC  3&FA 9=¬X9@GT8@P  N8@XO5MCR1)TU2)X  E1D  6S440F10035

T+/HLQDA &<XF&||  7'|E 1<XS5'|A:+I  Q|G01¬E-&<PR6)$  RE4CT2<PN&+|H2;I  2;I 5)$T&<E @"¬  4@M  @R<40F10036

T+/.+&<$A2)|U6*N  .&DA &+.P0*|E&<G  V0*XL0*.L1MCO5MC  3'"L1&+$A8UCU8%P  D&+LPK4A &(XE8%P  T&+H O#440F10037

T+/<I:+.T1)J/@4C  H0)|TE4CR1;.T0)X  T&||7'|E.&DA &DA  &DA &DA &DA &DA  &(XE0*LW6*XT1&      R.440F10038

T+J(C     & BN&          6N    @|C  0@|C1@|H  |C0@|C  1              A  "  A                +:E 40F10039

TAA(H                                                                                          7H440F10040

E"""*E7*=¬DC"PH$  ="7M&F|   |   C    F%   ASC   R A  S0   Q                11350908741  12174@#U40F10041
```

LAST PAGE

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT                                  LAST CHG:08 01 74
                                2 *
                                3         DECK  4
                                4         SEQ   0
                          0000  5 L3741   START 0
                                6         TREP
                          0A00  7         ORG   X'A00'
                                8 ********************************************************************************
                                9 *       3741 FUNCTION TEST          WITHOUT DIAGNOSTIC CONNECTOR          *
                               10 ********************************************************************************
                               11 *                                   SECTION PREFACE                       *
                               12 ********************************************************************************
0A00 4011                 0A01 13         DC    XL2'4011'             PROGRAM ID AND REVISION LEVEL
0A02 00                   0A02 14         DC    XL1'00'               SECTION FLAGS
0A03 01                   0A03 15         DC    XL1'01'               CURRENT ROUTINE NUMBER
0A04 0000                 0A05 16         DC    XL2'0000'             RESERVED
0A06 0A0D                 0A07 17         DC    AL2(BEGIN)            FIRST ROUTINE ADDRESS
0A08 FFFF                 0A09 18         DC    XL2'FFFF'             RESERVED
0A0A 405000               0A0C 19         DC    XL3'405000'           SECTION PREFACE UNIT DEF. TABLE
                               20
                               21 ********************************************************************************
                               22 *                  INTRODUCTION         TELL OPERATOR TO DO SYSTEM RESET      *
                               23 ********************************************************************************
0A0D 01                   0A0D 24 BEGIN   DC    XL1'01'               DUMMY ROUTINE PREFIX.
0A0E 00                   0A0E 25         DC    XL1'00'
0A0F 0A51                 0A10 26         DC    AL2(RTN01)
                               27
                          0A11 28 BEGINN  EQU   *
0A11 C0 87 021A                29         B     PRINT                 PRINT BEGINNING INSTRUCTIONS
0A15 41                   0A15 30         DC    XL1'41'
0A16 77                   0A16 31         DC    AL1(MSG1-MSG1B)
0A17 1A03                 0A18 32         DC    AL2(MSG1)
0A19 40E0                 0A1A 33         DC    XL2'40E0'
0A1B C0 87 021A                34         B     PRINT
0A1F 06                   0A1F 35         DC    XL1'06'
0A20 50                   0A20 36         DC    AL1(MSG2-MSG2B)
0A21 1A53                 0A22 37         DC    AL2(MSG2)
                               38
0A23 3C 40 1F4A                39         MVI   PRT+1,X'40'           BUILD 'CLEARING' BYTE.
0A27 0C 5A 1F49 1F4A           40         MVC   PRT(91),PRT+1         CLEAR PRINT AREA.
0A2D C2 01 0A51                41         LA    RTN01,XR1             RESTORE RTN01 ADDRESS.
0A31 34 01 0A07                42         ST    FRTN,XR1
0A35 3C E0 0A4C                43         CLI   HPLXX,X'E0'           CURRENT HALT A -E0- ?
0A39 F2 21 C7                  44         JE    ALTER                 JUMP IF SO.
0A3C 3C E0 0A4C                45         MVI   HPLXX,X'E0'           SET UP FOR A -E0- HALT.
0A40 F2 87 C4                  46         J     *+7
0A43 3C E1 0A4C                47 ALTER   MVI   HPLXX,X'E1'           SET UP FOR A -E1- HALT.
                               48
0A47 C0 87 0222                49         B     HALT                  PROGRAM HALT -E0- OR -E1-.
0A4B 40E1                 0A4C 50 HPLXX   DC    XL2'40E1'
                               51
0A4D C0 87 0A11                52         B     BEGINN                REPEAT MESSAGE IF NO SYSTEM RESET.
```


4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                               54 *********
                               55 * RTN01 *
                               56 ********************************************************************************
                               57 *                                                                              *
                               58 *       ROUTINE C1          TEST 3741 FOR NOT READY.                           *
                               59 *                                                                              *
                               60 ********************************************************************************
0A51 01                   0A51 61 RTN01   DC    XL1'01'               ROUTINE NUMBER
0A52 00                   0A52 62         DC    XL1'00'               NO MANUAL INTERVENTION REQUIRED
0A53 0A6E                 0A54 63         DC    AL2(RTN02)            ROUTINE 02 ADDRESS
                               64
0A55 C0 87 021A                65         B     PRINT                 PRINT NOT READY TEST HEADING.
0A59 45                   0A59 66         DC    XL1'45'
0A5A 18                   0A5A 67         DC    IL1'24'
0A5B 1CDD                 0A5C 68         DC    AL2(TORDY)
0A5D 40A1                 0A5E 69         DC    XL2'40A1'
                               70
0A5F C0 87 175D                71         B     QUES                  TEST FOR SSW 10.
0A63 F0 3C 3C                  72         HPL   X'3C',X'3C'           HALT -FF- IF ON.
                               73
0A66 C1 40 0216                74         TIO   LINK,X'40'            BRANCH TO DCP IF NOT READY.
                               75
0A6A C0 87 1787                76         B     TIOERD                BRANCH TO RDY ERROR IF NOT ON.
                               77
                               78
                               79 *********
                               80 * RTN02 *
                               81 ********************************************************************************
                               82 *                                                                              *
                               83 *       ROUTINE 02          TEST 3741 FOR NOT BUSY.                            *
                               84 *                                                                              *
                               85 ********************************************************************************
0A6E 02                   0A6E 86 RTN02   DC    XL1'02'               ROUTINE NUMBER
0A6F 00                   0A6F 87         DC    XL1'00'               NO MANUAL INTERVENTION REQUIRED
0A70 0A88                 0A71 88         DC    AL2(RTN03)            ROUTINE 03 ADDRESS
                               89
0A72 C0 87 021A                90         B     PRINT                 PRINT BUSY TEST HEADING.
0A76 45                   0A76 91         DC    XL1'45'
0A77 17                   0A77 92         DC    IL1'23'
0A78 1CC5                 0A79 93         DC    AL2(TOBSY)
0A7A 40A2                 0A7B 94         DC    XL2'40A2'
                               95
0A7C C0 87 175D                96         B     QUES                  TEST FOR SSW 10.
0A80 F0 3C 3C                  97         HPL   X'3C',X'3C'           HALT -FF- IF ON.
                               98
0A83 C1 42 17BF                99         TIO   TIOERB,X'42'          BRANCH OUT ON ERROR IF BUSY.
                              100
0A87 C0 87 0216               101         B     LINK                  RETURN TO DCP.
                              102
                              103
                              104 *********
                              105 * RTN03 *
                              106 ********************************************************************************
                              107 *                                                                              *
                              108 *       ROUTINE 03          SENSE THE STATUS-LENGTH COUNT REGISTERS.           *
                              109 *                                                                              *
                              110 ********************************************************************************
0A88 03                   0A88 111 RTN03  DC    XL1'03'               ROUTINE NUMBER
0A8C 00                   0A8C 112        DC    XL1'00'               NO MANUAL INTERVENTION REQUIRED.
0A8D 0AFD                 0A8E 113        DC    AL2(RTN04)            ROUTINE 04 ADDRESS.
                              114
0A8F 38 80 0208               115         TBN   SBYTE0,SSW00          TEST FOR LOOP ON SECTION SWITCH.
0A93 C0 10 0216               116         BT    LINK                  SKIP THIS ROUTINE IF ON.
                              117
0A97 0C 09 1EF8 1E66          118         MVC   PRT-81(10),SNTPE      BUILD UP TEST HEADING FOR PRINTING.
0A9D 0C 20 1F19 1AC4          119         MVC   PRT-48(33),STLCR
0AA3 3C 4B 1F1A               120         MVI   PRT-47,X'4B'
0AA7 C0 87 021A               121         B     PRINT                 GO PRINT TEST HEADING.
```

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0AAE 46                 0AAB  122        DC    XL1'46'
 0AAC 5B                 0AAC  123        DC    IL1'91'
 0AAD 1F49               0AAE  124        DC    AL2(PRT)
 0AAF 40A3               0AB0  125        DC    XL2'40A3'
 0AB1 0C 5A 1F49 1F4A          126        MVC   PRT(91),PRT+1
                               127
 0AB7 31 41 18CE               128        LIO   HOC00,X'41'
 0ABB C1 42 178F               129        TIO   DRCPD,X'42'
 0ABF 31 45 18CE               130        LIO   HO000,X'45'
 0AC3 30 43 0B3D               131        SNS   TRL,X'43'
 0AC7 C1 42 178F               132        TIO   DRCFD,X'42'
 0ACB 31 44 18E8               133        LIO   HOF55,X'44'
                               134
 0ACF C0 87 175D               135        B     QUES
 0AD3 F0 3C 3C                 136        MPL   X'3C',X'3C'
                               137
 0AD6 30 42 0AEB               138        SNS   LCF,X'42'
 0ADA 0D 01 0AEE 0AE9          139        CLC   LCR(2),LCR-2
 0AEC C0 81 0216               140        BE    LINK
                               141
                               142 * ROUTINE 03 ERROR MESSAGE *
                               143
 0AE4 C0 87 13BB               144        B     SNSERR
 0AE8 8000               0AE9  145        DC    XL2'8000'
 0AEA 0000               0AEB  146 LCR    DC    XL2'0000'
 0AEC 03                 0AEC  147        DC    XL1'03'
 0AED C0 87 17D9               148        B     MAFS
 0AF1 8741               0AF2  149        DC    XL2'8741'
                               150
 0AF3 C0 87 0222               151        B     HALT
 0AF7 4003               0AF8  152        DC    XL2'4003'
 0AF9 C0 87 0216               153        B     LINK
                               154
                               155
                               156 *********
                               157 * RTN04 *
                               158 ************************************************************************
                               159 *                                                                      *
                               160 *       ROUTINE C4        SENSE THE I/O TRANSFER LINES.                *
                               161 *                                                                      *
                               162 ************************************************************************
 0AFD 04                 0AFD  163 RTN04  DC    XL1'04'          ROUTINE NUMBER
 0AFE 00                 0AFE  164        DC    XL1'00'          NO MANUAL INTERVENTION REQUIRED.
 0AFF 084F               0B00  165        DC    AL2(RTN05)       ROUTINE 05 ADDRESS.
                               166
 0B01 0C 09 1EF8 1E66          167        MVC   PRT-81(10),SNTHE BUILD UP TEST HEADING FOR PRINTING.
 0B07 0C 11 1F0A 1AD6          168        MVC   PRT-63(18),IOTRL
 0B0D 3C 4B 1F08               169        MVI   PRT-62,X'4B'
 0B11 C0 87 021A               170        B     PRINT            GO PRINT TEST HEADING.
 0B15 46                 0B15  171        DC    XL1'46'
 0B16 5B                 0B16  172        DC    IL1'91'
 0B17 1F49               0B18  173        DC    AL2(PRT)
 0B19 40A4               0B1A  174        DC    XL2'40A4'
 0B1B 0C 5A 1F49 1F4A          175        MVC   PRT(91),PRT+1      CLEAR PRINT AREA.
                               176
 0B21 C0 87 175D               177        B     QUES             TEST FOR SSW 10.
 0B25 F0 3C 3C                 178        MPL   X'3C',X'3C'      HALT -FF- IF ON.
                               179
 0B28 30 43 0B3D               180        SNS   TRL,X'43'        SENSE I/O TRANSFER LINES FOR 0000.
 0B2C 0D 01 0B3D 0B38          181        CLC   TRL(2),TRL-2     SENSED DATA AS EXPECTED ?
 0B32 C0 81 0216               182        BE    LINK             RETURN TO DCP IF OK.
                               183
                               184 * ROUTINE 04 ERROR MESSAGE *
                               185
 0B36 C0 87 13BB               186        B     SNSERR           GO PRINT SENSE ERROR.
 0B3A 0000               0B3B  187        DC    XL2'0000'        -EXPECTED.
 0B3C 0000               0B3D  188 TRL    DC    XL2'0000'        -ACTUAL.
 0B3E 04                 0B3E  189        DC    XL1'04'          -ERROR ID.
```


4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 CB3F C0 87 17D9               190        B     MAFS             POINT TO MAP CHART.
 0B43 8781               0B44  191        DC    XL2'8781'        -PAGE 878. ENTRY 1.
                               192
 0B45 CC 87 0222               193        B     HALT             ERROR HALT -04-.
 0B49 4004               0B4A  194        DC    XL2'4004'
 0B4B C0 87 0216               195        B     LINK             RETURN TO DCP.
                               196
                               197
                               198 *********
                               199 * RTN05 *
                               200 ************************************************************************
                               201 *                                                                      *
                               202 *       ROUTINE C5        SENSE THE DIAGNOSTIC BYTE.                   *
                               203 *                                                                      *
                               204 ************************************************************************
 0B4F 05                 0B4F  205 RTN05  DC    XL1'05'          ROUTINE NUMBER
 0B50 00                 0B50  206        DC    XL1'00'          NO MANUAL INTERVENTION REQUIRED.
 0B51 0BA9               0B52  207        DC    AL2(RTN06)       ROUTINE 06 ADDRESS.
                               208
 0B53 38 80 02C8               209        TBN   SBYTE0,SSW00     TEST FOR LOOP ON SECTION SWITCH.
 0B57 C0 10 0216               210        BT    LINK             SKIP THIS ROUTINE IF ON.
                               211
 0B5B 0C 09 1EF8 1E66          212        MVC   PRT-81(10),SNTHE BUILD UP TEST HEADING FOR PRINTING.
 0B61 0C 0E 1F07 1BCA          213        MVC   PRT-66(15),DIAG
 0B67 3C 4B 1F08               214        MVI   PRT-65,X'4B'
 0B6B C0 87 021A               215        B     PRINT            GO PRINT TEST HEADING.
 0B6F 46                 0B6F  216        DC    XL1'46'
 0B70 5B                 0B70  217        DC    IL1'91'
 0B71 1F49               0B72  218        DC    AL2(PRT)
 0B73 40A5               0B74  219        DC    XL2'40A5'
 0B75 0C 5A 1F49 1F4A          220        MVC   PRT(91),PRT+1      CLEAR PRINT AREA.
                               221
 0B7B C0 87 175D               222        B     QUES             TEST FOR SSW 10.
 0B7F F0 3C 3C                 223        MPL   X'3C',X'3C'      HALT -FF- IF ON.
                               224
 0B82 30 45 0B97               225        SNS   DUG,X'45'        SENSE DIAGNOSIC BYTE FOR 00.
 0B86 0D 00 0B96 0B94          226        CLC   DUG-1(1),DUG-3   SENSED DATA AS EXPECTED ?
 0B8C C0 81 0216               227        BE    LINK             RETURN TO DCP IF OK.
                               228
                               229 * ROUTINE 05 ERROR MESSAGE *
                               230
 CB50 C0 87 13BB               231        B     SNSERR           GO PRINT SENSE ERROR.
 0B54 0000               0B95  232        DC    XL2'0000'        -EXPECTED.
 0B96 0000               0B97  233 DUG    DC    XL2'0000'        -ACTUAL.
 0B98 05                 0B98  234        DC    XL1'05'          -ERROR ID.
 0B99 C0 87 17D9               235        B     MAPS             POINT TO MAP CHART.
 0B9D 8811               0B9E  236        DC    XL2'8811'        -PAGE 881. ENTRY 1.
                               237
 0B9F C0 87 0222               238        B     HALT             ERROR HALT -05-.
 0BA3 4005               0BA4  239        DC    XL2'4005'
 0BA5 C0 87 0216               240        B     LINK             RETURN TO DCP.
                               241
                               242
                               243 *********
                               244 * RTN06 *
                               245 ************************************************************************
                               246 *                                                                      *
                               247 *       ROUTINE C6        CHECK EB CYCLES FOR PROPER                   *
                               248 *                         DATA TRANSMISSION.                           *
                               249 *                                                                      *
                               250 ************************************************************************
 0BA9 06                 0BA9  251 RTN06  DC    XL1'06'          ROUTINE NUMBER
 0BAA 00                 0BAA  252        DC    XL1'00'          NO MANUAL INTERVENTION REQUIRED
 0BAB 0D37               0BAC  253        DC    AL2(RTN07)       ROUTINE 07 ADDRESS
                               254
 0BAD C0 87 021A               255        B     PRINT            PRINT EB CYCLE TEST HEADING.
 0BB1 45                 0BB1  256        DC    XL1'45'
 0BB2 24                 0BB2  257        DC    IL1'36'
```

4011   3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0BE3 1BBB              0BB4  258          DC     AL2(TSCYC)
   0BE5 40A6              0BB6  259          DC     XL2'40A6'
                                260
   0BE7 C1 42 178F              261          TIO    DRCPD,X'42'            JUMP OUT IF 3741 IS BUSY.
                                262
   0BBE C0 87 175D              263          B      QUES                   TEST FOR SSW 10.
   0BEF F0 3C 3C                264          HPL    X'3C',X'3C'            HALT -FF- IF ON.
                                265
   0BC2 31 41 18F2              266          LIO    HFF55,X'41'            LOAD FUNCTION REG. WITH -FF55-.
   0BC6 31 42 18F2              267          LIO    HFF55,X'42'            LOAD LENGTH COUNT REG WITH -55-.
   0BCA 31 44 18F2              268          LIC    HFF55,X'44'            LOAD DATA ADRS REG WITH -FF55-.
   0BCE 31 45 18F2              269          LIC    HFF55,X'45'            LOAD DATA TRANS REG WITH -55-.
                                270
   0BD2 30 41 190F              271          SNS    LS-6,X'41'             SENSE FUNCTION REGISTER.
   0BD6 30 42 1911              272          SNS    LS-4,X'42'             SENSE STATUS AND LCR.
   0BDA 30 44 1913              273          SNS    LS-2,X'44'             SENSE DATA ADRS REGISTER.
   0BDE 30 45 1915              274          SNS    LS,X'45'               SENSE DIAG AND DATA TRANS REG.
                                275
   0BE2 C2 01 1915              276          LA     LS,XR1                 INITIALIZE SENSE STORAGE ADDRESS.
   0BE6 34 01 0BF5              277          ST     CKEYT+3,XR1
   0BEA 3C 00 191D              278          MVI    EBFLAG,X'00'           CLEAR EB FLAG.
   0BEE 3C 01 0BFE              279          MVI    STEN+1,X'01'           INITIALIZE FLAG BIT POINTER.
                                280
   0BF2 3D 00 0000              281 CKBYT    CLI    *-*,X'00'              TEST CURRENT SENSE BYTE.
   0BF6 C0 01 0BFE              282          BNE    *+8                    BRANCH IF BYTE NOT ZERO.
   0BFA 3A C0 191D              283 STBN     SBN    EBFLAG,X'00'           TURN ON FLAG BIT IF ZERO.
   0BFE 0E 00 0BFE 0BF8         284          ALC    STEN+1(1),STBN+1       SHIFT BIT POINTER.
   0C04 0F 01 0BF5 1800         285          SLC    CKEYT+3(2),N001        DECREMENT SENSE ADDRESS.
   0C0A 39 FF 0BFB              286          TBF    STEN+1,X'FF'           POINTER GONE TO ZERO ?
   0C0E C0 90 0BF2              287          BF     CKEYT                  CONTINUE TO LOOP IF NOT SO.
                                288
                                289 *        ANALYZE THE EB FLAG BYTE.
                                290
   0C12 3D F3 191D              291          CLI    EBFLAG,X'F3'
   0C16 C0 81 0C94              292          BE     EBERR                  BRANCH IF BOTH EB1 AND EB2 FAILED.
   0C1A 3D 53 191D              293          CLI    EBFLAG,X'53'
   0C1E C0 81 0C7E              294          BE     EB1ERR                 BRANCH IF EB1 FAILED.
   0C22 3D A2 191D              295          CLI    EBFLAG,X'A2'
   0C26 C0 81 0C86              296          BE     EB2ERR                 BRANCH IF EB2 FAILED.
                                297
   0C2A 3C C0 191D              298          CLI    EBFLAG,X'C0'
   0C2E C0 81 0C9E              299          BE     NCOD1                  BRANCH IF BOTH EB'S OF N=1 FAILED.
   0C32 3D 30 191D              300          CLI    EBFLAG,X'30'
   0C36 C0 81 0CA5              301          BE     NCOD2                  *                   2       *
   0C3A 3D 0C 191D              302          CLI    EBFLAG,X'0C'
   0C3E C0 81 0CAC              303          BE     NCOD4                  *                   4       *
                                304
   0C42 38 40 191D              305          TBN    EBFLAG,X'40'
   0C46 C0 10 0CBA              306          BT     NCODD1                 BRANCH IF EB1 OF N=1 FAILED.
   0C4A 38 80 191D              307          TBN    EBFLAG,X'80'
   0C4E C0 10 0CEA              308          BT     NCODD1                 *        2       1       *
   0C52 38 10 191D              309          TBN    EBFLAG,X'10'
   0C56 C0 10 0CD5              310          BT     NCODD2                 *        1       2       *
   0C5A 38 20 191D              311          TBN    EBFLAG,X'20'
   0C5E C0 10 0CD5              312          BT     NCODD2                 *        2       2       *
   0C62 38 04 191D              313          TBN    EBFLAG,X'04'
   0C66 C0 10 0CF0              314          BT     NCODD4                 *        1       4       *
   0C6A 38 08 191D              315          TBN    EBFLAG,X'08'
   0C6E C0 10 0CF0              316          BT     NCODD4                 *        2       4       *
   0C72 38 01 191D              317          TBN    EBFLAG,X'01'
   0C76 C0 10 0D0B              318          BT     NCODD5                 *        1       5       *
                                319
   0C7A C0 87 0216              320          B      LINK                   RETURN TO DCP.
                                321
                                322 * ROUTINE 06 ERROR MESSAGES *
                                323
   0C7E 3C F1 1888              324 EB1ERR   MVI    ALEBX-15,C'1'          SET UP FOR EB 1 ERROR.
   0C82 C0 87 0C8A              325          B      *+8
```


4011   3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0C86 3C F2 1888              326 EB2ERR   MVI    ALEBX-15,C'2'          SET UP FOR EB 2 ERROR.
   0C8A 0C 17 1F06 1857         327          MVC    PRT-67(24),ALEBX
   0C90 C0 87 0D19              328          B      BIGEB                  PRINT ERROR HEADING.
                                329
   0C94 0C 16 1F05 187F         330 EBERR    MVC    PRT-68(23),ALEB        SET UP FOR ALL EB FAILURE.
   0C9A C0 87 0D19              331          B      BIGEB                  PRINT ERROR HEADING.
                                332
   0C9E 3C F1 1867              333 NCOD1    MVI    EB12-1,C'1'            SET UP FOR BOTH EB'S. N = 1.
   0CA2 F2 87 0B                334          J      FINEB                  GO PRINT ERROR.
   0CA5 3C F2 1867              335 NCOD2    MVI    EB12-1,C'2'            SET UP FOR BOTH EB'S. N = 2.
   0CA9 F2 87 04                336          J      FINEB                  GO PRINT ERROR.
   0CAC 3C F4 1867              337 NCOD4    MVI    EB12-1,C'4'            SET UP FOR BOTH EB'S. N = 4.
   0CB0 0C 21 1F10 1868         338 FINEB    MVC    PRT-57(34),EB12
   0CB6 C0 87 0D19              339          B      BIGEB                  GO PRINT ERROR HEADING.
                                340
   0CBA 3C F1 1845              341 NCODD1   MVI    EBX-1,C'1'             SET UP FOR N CODE 1 ERROR.
   0CBE 38 40 191D              342          TBN    EBFLAG,X'40'
   0CC2 C0 10 0CCE              343          BT     *+12
   0CC6 3C F2 182E              344          MVI    EBX-24,C'2'            * EB2 CYCLE.
   0CCA C0 87 0CD2              345          B      *+8
   0CCE 3C F1 182E              346          MVI    EBX-24,C'1'            * EB1 CYCLE.
   0CD2 F2 87 3E                347          J      EBXX                   GO PRINT ERROR.
   0CD5 3C F2 1845              348 NCODD2   MVI    EBX-1,C'2'             SET UP FOR N CODE 2 ERROR.
   0CD9 38 10 191D              349          TBN    EBFLAG,X'10'
   0CDD C0 10 0CE9              350          BT     *+12
   0CE1 3C F2 182E              351          MVI    EBX-24,C'2'            * EB2 CYCLE.
   0CE5 C0 87 0CED              352          B      *+8
   0CE9 3C F1 182E              353          MVI    EBX-24,C'1'            * EB1 CYCLE.
   0CED F2 87 23                354          J      EBXX                   GO PRINT ERROR.
   0CF0 3C F4 1845              355 NCODD4   MVI    EBX-1,C'4'             SET UP FOR N CODE 4 ERROR.
   0CF4 38 04 191D              356          TBN    EBFLAG,X'04'
   0CF8 C0 10 0D04              357          BT     *+12
   0CFC 3C F2 182E              358          MVI    EBX-24,C'2'            * EB2 CYCLE.
   0D00 C0 87 0D08              359          B      *+8
   0D04 3C F1 182E              360          MVI    EBX-24,C'1'            * EB1 CYCLE.
   0D08 F2 87 C8                361          J      EBXX                   GO PRINT ERROR.
                                362
   0D0B 3C F5 1845              363 NCODD5   MVI    EBX-1,C'5'             SET UP FOR N CODE 5 ERROR.
   0D0F 3C F1 182E              364          MVI    EBX-24,C'1'            * EB1 CYCLE.
   0D13 0C 1C 1F08 1846         365 EBXX     MVC    PRT-62(29),EBX
                                366
   0D19 C0 87 021A              367 BIGEB    B      PRINT                  PRINT EB CYCLE ERROR HEADING.
   0D1D C2                0D1D  368          DC     XL1'C2'
   0D1E 18                0D1E  369          DC     IL1'24'
   0D1F 1829              0D20  370          DC     AL2(BIGGEB)
   0D21 4006              0D22  371          DC     XL2'4006'
   0D23 C0 87 18A7              372          B      ERPNT2                 PRINT SPECIAL ERROR ID.
   0D27 C0 87 17D9              373          B      MAPS                   POINT TO MAP CHARTS.
   0D2B 8851              0D2C  374          DC     XL2'8851'              -PAGE 885. ENTRY 1.
   0D2D C0 87 0222              375          B      HALT                   ERROR HALT -06-.
   0D31 4006              0D32  376          DC     XL2'4006'
   0D33 C0 87 0216              377          B      LINK                   RETURN TO DCP.
                                378
                                379
                                380 *********
                                381 * RTN07 *
                                382 ******************************************************************
                                383 *                                                                *
                                384 *        ROUTINE 07        LIC & SNS FUNCTION REG WITH AA55.     *
                                385 *                                                                *
                                386 ******************************************************************
   0D37 07                0D37  387 RTN07    DC     XL1'07'                ROUTINE NUMBER
   0D38 00                0D38  388          DC     XL1'00'                NO MANUAL INTERVENTION REQUIRED
   0D39 0D6F              0D3A  389          DC     AL2(RTN08)             ROUTINE 08 ADDRESS
                                390
   0D3B 0C 01 1919 18E0         391          MVC    PATRN(2),HAA55         STORE TEST PATTERN.
   0D41 C0 87 1800              392          B      CCDE                   PRINT TEST HEADING.
   0D45 F1                0D45  393          DC     CL1'1'
```

4011   3741 FUNCTICN TEST WITHOUT THE WRAP CCNNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               394
    0D46 CC 87 1750            395         B     QUES                  TEST FOR SSW 10.
    0D4A F0 3C 3C              396         HPL   X'3C'.X'3C'           HALT -FF- IF ON.
                               397
    0D4D 31 41 1919            398         LIO   PATRN.X'41'           LOAD FUNCTION REG WITH -AA55-.
    0D51 30 41 1917            399         SNS   LSCK.X'41'            SENSE FUNCTION REG FOR -AA55-.
                               400
    CD55 CC 87 1488            401         B     LICSNS                GO COMPARE RESULT WITH EXPECTED.
    0D59 07               0D59 402         DC    XL1'07'               -ERROR ID.
    CD5A F1               0D5A 403         DC    CL1'1'                -N CODE.
    0D5B C0 87 0216            404         B     LINK                  RETURN TO DCP IF OK.
                               405
    0D5F CC 87 1709            406         B     MAFS                  POINT TO MAP CHART.
    0D63 8891             0D64 407         DC    XL2'8891'             -PAGE 889. ENTRY 1.
    0D65 C0 87 0222            408         B     HALT                  ERROR HALT -07-.
    0D69 4007             0D6A 409         DC    XL2'4007'
    0D6E C0 87 0216            410         B     LINK                  RETURN  TO DCP.
                               411
                               412
                               413 *********
                               414 * RTN08 *
                               415 ****************************************************************
                               416 *                                                              *
                               417 *      ROUTINE C8        LIO & SNS FUNCTION REG WITH 55AA.     *
                               418 *                                                              *
                               419 ****************************************************************
    0D6F 08               0D6F 420 RTN08  DC    XL1'08'               ROUTINE NUMBER
    0D70 00               0D70 421        DC    XL1'00'               NO MANUAL INTERVENTION REQUIRED
    0D71 0DA7             0D72 422        DC    AL2(RTN09)            ROUTINE 09 ADDRESS
                               423
    0D73 0C 01 1919 18E2       424        MVC   PATRN(2).H55AA        STORE TEST PATTERN.
    0D79 C0 87 1800            425        B     CODE                  PRINT TEST HEADING.
    CD7D F1               0D7D 426        DC    CL1'1'
                               427
    0D7E C0 87 175D            428        B     QUES                  TEST FOR SSW 10.
    0D82 F0 3C 3C              429        HPL   X'3C'.X'3C'           HALT -FF- IF ON.
                               430
    CD85 31 41 1919            431        LIO   PATRN.X'41'           LOAD FUNCTION REG WITH -55AA-.
    0D89 30 41 1917            432        SNS   LSCK.X'41'            SENSE FUNCTION REG FOR -55AA-.
                               433
    CD8D C0 87 1488            434        B     LICSNS                GO COMPARE RESULT WITH EXPECTED.
    0D91 08               0D91 435        DC    XL1'08'               -ERROR ID.
    CD92 F1               0D92 436        DC    CL1'1'                -N CODF.
    CD93 CC 87 0216            437        B     LINK                  RETURN TO DCP IF OK.
                               438
    CD97 C0 87 1709            439        B     MAFS                  POINT TO MAP CHART.
    CD9B 8891             0D9C 440        DC    XL2'8891'             -PAGE 889. ENTRY 1.
    0D9D C0 87 0222            441        B     HALT                  ERROR HALT -08-.
    0DA1 4008             0DA2 442        DC    XL2'4008'
    0DA3 C0 87 0216            443        B     LINK                  RETURN TO DCP.
                               444
                               445
                               446 *********
                               447 * RTN09 *
                               448 ****************************************************************
                               449 *                                                              *
                               450 *      ROUTINE C9        LIO & SNS LENGTH COUNT REG WITH 55.   *
                               451 *                                                              *
                               452 ****************************************************************
    0DA7 09               0DA7 453 RTN09  DC    XL1'09'               ROUTINE NUMBER
    0DA8 00               0DA8 454        DC    XL1'00'               NO MANUAL INTERVENTION REQUIRED
    0DA9 0DE3             0DAA 455        DC    AL2(RTN0A)            ROUTINE 0A TEST
                               456
    CDAB CC 01 1919 18E6       457        MVC   PATRN(2).H0055        STORE TEST PATTERN.
    0DB1 C0 87 1800            458        B     CODE                  PRINT TEST HEADING.
    CDB5 F2               0DB5 459        DC    CL1'2'
                               460
    0DB6 C0 87 175D            461        B     QUES                  TEST FOR SSW 10.
```


4011   3741 FUNCTICN TEST WITHOUT THE WRAP CCNNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0DBA F0 3C 3C              462        HPL   X'3C'.X'3C'           HALT -FF- IF ON.
                               463
    0DBD 31 42 1919            464        LIO   PATRN.X'42'           LOAD LENGTH COUNT REG WITH -55-.
    0DC1 30 42 1917            465        SNS   LSCK.X'42'            SENSE STATUS AND LCR FOR -8055-.
                               466
    0DC5 3C 00 1916            467        MVI   LSCK-1.X'00'          CLEAR STATUS BYTE.
                               468
    CDC9 C0 87 1488            469        B     LICSNS                GO COMPARE RESULT WITH EXPECTED.
    0DCD 09               0DCD 470        DC    XL1'09'               -ERROR ID.
    0DCE F2               0DCE 471        DC    CL1'2'                -N CODE.
    0DCF C0 87 0216            472        B     LINK                  RETURN TO DCP IF OK.
                               473
    0DD3 C0 87 17D9            474        B     MAFS                  POINT TO MAP CHART.
    0DC7 8911             0DD8 475        DC    XL2'8911'             -PAGE 891. ENTRY 1.
    0DD9 C0 87 0222            476        B     HALT                  ERROR HALT -09-.
    0DDD 4009             0DDE 477        DC    XL2'4009'
    0DDF C0 87 0216            478        B     LINK                  RETURN TO DCP.
                               479
                               480
                               481 *********
                               482 * RTN0A *
                               483 ****************************************************************
                               484 *                                                              *
                               485 *      ROUTINE CA        LIO & SNS LENGTH COUNT REG WITH AA.   *
                               486 *                                                              *
                               487 ****************************************************************
    0DE3 0A               0DE3 488 RTN0A  DC    XL1'0A'               ROUTINE NUMBER
    0DE4 00               0DE4 489        DC    XL1'00'               NO MANUAL INTERVENTION REQUIRED
    0DE5 0E42             0DE6 490        DC    AL2(RTN0B)            ROUTINE 0B ADDRESS
                               491
    0DE7 0C 01 1919 18EA       492        MVC   PATRN(2).H00AA        STORE TEST PATTERN.
    0DED C0 87 1800            493        B     CODE                  PRINT TEST HEADING.
    0DF1 F2               0DF1 494        DC    CL1'2'
                               495
    0DF2 C0 87 175D            496        B     QUES                  TEST FOR SSW 10.
    0DF6 F0 3C 3C              497        HPL   X'3C'.X'3C'           HALT -FF- IF ON.
                               498
    0DF9 31 42 1919            499        LIC   PATRN.X'42'           LOAD LENGTH COUNT REG WITH -AA-.
    CDFD 30 42 1917            500        SNS   LSCK.X'42'            SENSE STATUS & LCR FOR -80AA-.
                               501
    0E01 0D 00 18EE 1917       502        CLC   HFFFF(1).LSCK         WAS CLD PATTERN ERASED ?
    0E07 F2 81 1E              503        JE    ER0A                  JUMP IF NOT ERASED.
                               504
    0E0A 3C 00 1916            505        MVI   LSCK-1.X'00'          CLEAR STATUS BYTE.
                               506
    0ECE CC 87 1488            507        B     LICSNS                GO COMPARE RESULT WITH EXPECTED.
    0E12 0A               0E12 508        DC    XL1'0A'               -ERROR ID.
    0E13 F2               0E13 509        DC    CL1'2'                -N CODE.
    0E14 C0 87 0216            510        B     LINK                  RETURN TO DCP IF OK.
                               511
    0E18 C0 87 17D9            512        B     MAFS                  POINT TO MAP CHART.
    0E1C 8911             0E1D 513        DC    XL2'8911'             -PAGE 891. ENTRY 1.
    0E1E C0 87 0222            514        B     HALT                  ERROR HALT -0A-.
    0E22 400A             0E23 515        DC    XL2'400A'
    0E24 C0 87 0216            516        B     LINK                  RETURN TO DCP.
                               517
                               518 * RCUTINE 0A ERRCR MESSAGE *
                               519
    0E28 C0 87 021A            520 ER0A   B     PRINT                 PRINT LENGTH COUNT NOT RESET.
    0E2C C2               0E2C 521        DC    XL1'C2'
    0E2D 2B               0E2D 522        DC    IL1'43'
    0E2E 1C0B             0E2F 523        DC    AL2(LIORST)
    0E30 400C             0E31 524        DC    XL2'400C'
    0E32 C0 87 17D9            525        B     MAPS                  POINT TO MAF CHART.
    0E36 8912             0E37 526        DC    XL2'8912'             -PAGE 891. ENTRY 2.
    0E38 C0 87 0222            527        B     HALT                  ERROR HALT -0C-.
    0E3C 400C             0E3D 528        DC    XL2'400C'
    0E3E C0 87 0216            529        B     LINK                  RETURN TO DCP.
```

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                 *********
                                 * RTN0B *
                                 ************************************************************************
                                 *                                                                      *
                                 *      ROUTINE 0B        LIO & SNS DATA ADDRESS REG WITH EVEN TEST     *
                                 *                        PATTERNS. -55AA- AND -AA55-.                  *
                                 *                                                                      *
                                 ************************************************************************
  0E42 0B                0E42    RTN0B  DC    XL1'0B'                ROUTINE NUMBER
  0E43 00                0E43           DC    XL1'00'                NO MANUAL INTERVENTION REQUIRED
  0E44 0E98              0E45           DC    AL2(RTN0C)             ROUTINE 0C ADDRESS

  0E46 0C 03 1C7D 1C8F                  MVC   VNOD(4),EVEN           SET UP EVEN TEST HEADING.
  0E4C C0 87 021A                       B     PRINT                  PRINT TEST HEADING.
  0E50 46                0E50           DC    XL1'46'
  0E51 38                0E51           DC    IL1'56'
  0E52 1C8B              0E53           DC    AL2(LSDAR)
  0E54 40AB              0E55           DC    XL2'40AB'

  0E56 C0 87 175D                       B     QUES                   TEST FOR SSW 10.
  0E5A F0 3C 3C                         HPL   X'3C',X'3C'            HALT -FF- IF ON.

  0E5D 31 44 18E2                       LIO   H55AA,X'44'            LOAD DATA ADDRESS REG WITH -55AA-.
  0E61 30 44 1917                       SNS   LSCK,X'44'             SENSE DATA ADDRESS REGISTER.
  0E65 0D 01 18E2 1917                  CLC   H55AA(2),LSCK          DATA SENSED = DATA LOADED  ?
  0E6B F2 01 12                         JNE   DARCK

  0E6E 31 44 18E0                       LIO   HAA55,X'44'            LOAD DATA ADDRESS REG WITH -AA55-.
  0E72 30 44 1917                       SNS   LSCK,X'44'             SENSE DATA ADDRESS REGISTER.
  0E76 0D 01 18E0 1917                  CLC   HAA55(2),LSCK          DATA SENSED = DATA LOADED  ?
  0E7C C0 81 0216                       BE    LINK

  0E80 C0 87 021A                DARCK  B     PRINT
  0E84 C6                0E84           DC    XL1'C6'                DAR NOT SENSED AS LOADED
  0E85 50                0E85           DC    AL1(MSG4-MSG4B)
  0E86 1AA3              0E87           DC    AL2(MSG4)

  0E88 C0 87 17D9                       B     MAPS                   MAP CALL OUT
  0E8C 8913              0E8D           DC    XL2'8913'              -PAGE 891, ENTRY 3.

  0E8E C0 87 0222                       B     HALT                   HALT DUE TO DAR CHECK
  0E92 4067              0E93           DC    XL2'4067'

  0E94 C0 87 0216                       B     LINK                    RETURN TO DCP.


                                 *********
                                 * RTN0C *
                                 ************************************************************************
                                 *                                                                      *
                                 *      ROUTINE 0C        LIO & SNS DATA ADDRESS REG WITH ODD TEST      *
                                 *                        PATTERNS. -1000- AND -0001-.                  *
                                 *                                                                      *
                                 ************************************************************************
  0E98 0C                0E98    RTN0C  DC    XL1'0C'                ROUTINE NUMBER
  0E99 00                0E99           DC    XL1'00'                NO MANUAL INTERVENTION REQUIRED.
  0E9A 0EC7              0E9B           DC    AL2(RTN0D)             ROUTINE 0D ADDRESS

  0E9C 0C 03 1C7D 1C93                  MVC   VNOD(4),ODD            SET UP HEADING FOR ODD PATTERNS.
  0EA2 C0 87 021A                       B     PRINT                  PRINT TEST HEADING.
  0EA6 46                0EA6           DC    XL1'46'
  0EA7 38                0EA7           DC    IL1'56'
  0EA8 1C8B              0EA9           DC    AL2(LSDAR)
  0EAA 40AC              0EAB           DC    XL2'40AC'

  0EAC C0 87 175D                       B     QUES                   TEST FOR SSW 10.
  0EB0 F0 3C 3C                         HPL   X'3C',X'3C'            HALT -FF- IF ON.
```


4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  0EB3 31 44 18E4                       LIO   H1000,X'44'            LOAD DATA ADRS REG WITH -1000-.
  0EB7 30 44 1917                       SNS   LSCK,X'44'             SENSE DATA ADRS REGISTER.

  0EBB 31 44 18D0                       LIO   H0001,X'44'            LOAD DATA ADRS REG WITH -0001-.
  0EBF 30 44 1917                       SNS   LSCK,X'44'             SENSE DATA ADRS REGISTER.

  0EC3 C0 87 0216                       B     LINK                   RETURN TO DCP.
```

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               607 *********
                               608 * RTN0D *
                               609 ************************************************************************
                               610 *                                                                      *
                               611 *       ROUTINE 0D        LIO & SNS DATA TRANSFER REG WITH 55.         *
                               612 *                                                                      *
                               613 ************************************************************************
  0EC7 0D              0EC7    614 RTN0D  DC    XL1'0D'             ROUTINE NUMBER
  0EC8 00              0EC8    615        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
  0ECS 0F03            0ECA    616        DC    AL2(RTN0E)          ROUTINE 0E ADDRESS
                               617
  0ECB 0C 01 1919 18E6         618        MVC   PATRN(2),H0055      STORE TEST PATTERN.
  0ED1 C0 87 1800              619        B     CODE                PRINT TEST HEADING.
  0ED5 F5              0ED5    620        DC    CL1'5'
                               621
  0ED6 C0 87 175D              622        B     QUES                TEST FOR SSW 10.
  0EDA F0 3C 3C                623        HPL   X'3C',X'3C'         HALT -FF- IF ON.
                               624
  0EDD 31 45 1919              625        LIO   PATRN,X'45'         LOAD DATA TRANS REG WITH -55-.
  0EE1 30 45 1917              626        SNS   LSCK,X'45'          SENSE DIAG AND DTR FOR -0055-.
                               627
  0EE5 3C 00 191E              628        MVI   LSCK-1,X'00'        CLEAR DIAGNOSTIC BYTE.
                               629
  0EE9 C0 87 1488              630        B     LICSNS              GO COMPARE RESULT WITH EXPECTED.
  0EED 10              0EED    631        DC    XL1'10'             -ERROR ID.
  0EEE F5              0EEE    632        DC    CL1'5'              -N CODE.
  0EEF C0 87 0216              633        B     LINK                RETURN TO DCP IF OK.
                               634
  0EF3 C0 87 17D9              635        B     MAPS                POINT TO MAP CHART.
  0EF7 8931            0EF8    636        DC    XL2'8931'           -PAGE 893, ENTRY 1.
  0EF9 C0 87 0222              637        B     HALT                ERROR HALT -10-.
  0EFC 4010            0EFE    638        DC    XL2'4010'
  0EFF C0 87 0216              639        B     LINK                RETURN TO DCP.
                               640
                               641
                               642 *********
                               643 * RTN0E *
                               644 ************************************************************************
                               645 *                                                                      *
                               646 *       ROUTINE 0E        LIC & SNS DATA TRANSFER REG WITH AA.         *
                               647 *                                                                      *
                               648 ************************************************************************
  0F03 0F              0F03    649 RTN0E  DC    XL1'0E'             ROUTINE NUMBER
  0F04 00              0F04    650        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
  0F05 0F3F            0F06    651        DC    AL2(RTN0F)          ROUTINE 0F ADDRESS
                               652
  0F07 0C 01 1919 18EA         653        MVC   PATRN(2),H00AA      STORE TEST PATTERN.
  0F0D C0 87 1800              654        B     CODE                PRINT TEST HEADING.
  0F11 F5              0F11    655        DC    CL1'5'
                               656
  0F12 C0 87 175D              657        B     QUES                TEST FOR SSW 10.
  0F16 F0 3C 3C                658        HPL   X'3C',X'3C'         HALT -FF- IF ON.
                               659
  0F19 31 45 1919              660        LIC   PATRN,X'45'         LOAD DATA TRANS REG WITH -AA-.
  0F1D 30 45 1917              661        SNS   LSCK,X'45'          SENSE DIAG & DTR FOR -00AA-.
                               662
  0F21 3C 00 191E              663        MVI   LSCK-1,X'00'        CLEAR DIAGNOSTIC BYTE.
                               664
  0F25 C0 87 1488              665        B     LICSNS              GO COMPARE RESULT WITH EXPECTED.
  0F29 11              0F29    666        DC    XL1'11'             -ERROR ID.
  0F2A F5              0F2A    667        DC    CL1'5'              -N CODE.
  0F2B C0 87 0216              668        B     LINK                RETURN TO DCP IF OK.
                               669
  0F2F C0 87 17D9              670        B     MAPS                POINT TO MAP CHART.
  0F33 8931            0F34    671        DC    XL2'8931'           -PAGE 893, ENTRY 1.
  0F35 C0 87 C222              672        B     HALT                ERROR HALT -11-.
  0F39 4011            0F3A    673        DC    XL2'4011'
  0F3B C0 87 0216              674        B     LINK                RETURN TO DCP.
```


4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               676 *********
                               677 * RTN0F *
                               678 ************************************************************************
                               679 *                                                                      *
                               680 *       ROUTINE 0F        ISSUE A SIO ENABLE INTERUPT.                 *
                               681 *                                                                      *
                               682 ************************************************************************
  0F3F 0F              0F3F    683 RTN0F  DC    XL1'0F'             ROUTINE NUMBER
  0F40 00              0F40    684        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
  0F41 0FC1            0F42    685        DC    AL2(RTN10)          ROUTINE 10 ADDRESS
                               686
  0F43 C0 87 157E              687        B     SICHD               PRINT TEST HEADING.
  0F47 AF              0F47    688        DC    XL1'AF'             MESSAGE ID.
  0F48 E2C5E340C5D5C1C2 0F64   689        DC    CL29'SET ENABLE INTERRUPT LATCH.'
  0F50 D3CE40C5DEE3C5D9        689
  0F58 D9E4D7E340D3C1E3        689
  0F60 C3C84B4040              689
  0F65 C1 42 17BF              690        TIO   DRCPD,X'42'         MAKE SURE 3741 IS NOT BUSY.
  0F69 35 84 18FA              691        L     INTRS,IAR5          LOAD IAR 5 REGISTER.(IN CASE OF INT)
  0F6D 3B C1 18C1              692        SBF   FLAG,X'01'          RESET ERROR FLAG
  0F71 C0 87 175D              693        B     QUES                TEST FOR SSW 10.
  0F75 F0 3C 3C                694        HPL   X'3C',X'3C'         HALT -FF- IF ON.
                               695
  0F78 31 41 18DE              696        LIC   H0C80,X'41'         SET FUNC REG TO DIAG MODE.
  0F7C F3 40 02                697        SIO   X'02',X'40'         ISSUE ENABLE INTERRUPT.
  0F7F 30 45 18FC              698        SNS   DTR,X'45'           SENSE DIAG BYTE FOR -10-.
  0F83 38 01 18C1              699        TBN   FLAG,X'01'          ERROR FLAG SET ?
  0F87 F2 10 1D                700        JT    BADINT              JUMP IF SO.
  0F8A 3C 10 191C              701        MVI   XPCT,X'10'          STORE EXPECTED RESULT.
  0F8E C0 87 1580              702        B     CKSIO               GO CHECK EXPECTED WITH RESULT.
  0F92 12              0F92    703        DC    XL1'12'             ERROR ID.
  0F93 C0 87 0216              704        B     LINK                RETURN TO DCP IF OK.
                               705
  0F97 C0 87 17D9              706        B     MAPS                POINT TO MAP CHART.
  0F9B 8951            0F9C    707        DC    XL2'8951'           -PAGE 895, ENTRY 1.
  0F9D C0 87 0222              708        B     HALT                ERROR HALT -12-.
  0FA1 4012            0FA2    709        DC    XL2'4012'
  0FA3 C0 87 0216              710        B     LINK                RETURN TO DCP.
                               711
  0FA7 C0 87 021A              712 BADINT B     PRINT               PRINT INTERRUPT CHECK.
  0FAB C2              0FAB    713        DC    XL1'C2'
  0FAC 15              0FAC    714        DC    IL1'21'
  0FAD 1EEE            0FAE    715        DC    AL2(SIOC4)
  0FAF 401A            0FB0    716        DC    XL2'401A'
  0FB1 C0 87 17D9              717        B     MAPS                PRINT MAP CHART REFERENCE.
  0FB5 8952            0FB6    718        DC    XL2'8952'           -PAGE 895, ENTRY 2.
  0FB7 C0 87 0222              719        B     HALT                ERROR HALT -1A-.
  0FBB 401A            0FBC    720        DC    XL2'401A'
  0FBD C0 87 0216              721        B     LINK                RETURN TO DCP.
                               722 *********
                               723 * RTN10 *
                               724 ************************************************************************
                               725 *                                                                      *
                               726 *       ROUTINE 10        ISSUE A RESET INTERRUPT.                     *
                               727 *                                                                      *
                               728 ************************************************************************
  0FC1 10              0FC1    729 RTN10  DC    XL1'10'             ROUTINE NUMBER
  0FC2 00              0FC2    730        DC    XL1'00'             NO INTERVENTION REQUIRED
  0FC3 1022            0FC4    731        DC    AL2(RTN11)          ROUTINE 11 ADDRESS
                               732
  0FC5 C0 87 157E              733        B     SICHD               PRINT TEST HEADING.
  0FC9 B0              0FC9    734        DC    XL1'B0'             MESSAGE ID.
  0FCA D9C5E2C5E340C5D5 0FE6   735        DC    CL29'RESET ENABLE INTERRUPT LATCH.'
  0FD2 C1C2D3C540C9D5E3        735
  0FDA C5D9C9E4D7E340D3        735
  0FE2 C1E3C3C84B              735
  0FE7 C1 42 17BF              736        TIO   DRCPD,X'42'         MAKE SURE 3741 IS NOT BUSY.
                               737
```

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   OFEB C0 87 175D            738        B     QUES              TEST FOR SSW 10.
   OFEF F0 3C 3C              739        HPL   X'3C',X'3C'       HALT -FF- IF ON.
                              740
   OFF2 31 41 18DE            741        LIO   HOC80,X'41'       SET TO DIAGNOSTIC MODE.
   OFF6 F3 40 02              742        SIO   X'02',X'40'       ISSUE ENABLE INTERRUPT.
   OFF9 F3 40 04              743        SIO   X'04',X'40'       ISSUE INTERRUPT RESET.
   OFFC 30 45 18FC            744        SNS   DTF,X'45'         SENSE DIAG BYTE FOR -00-.
                              745
   1000 38 10 18FB            746        TBN   DTF-1,X'10'       DID ENABLE BIT GET RESET ?
   1004 C0 90 0216            747        BF    LINK              RETURN TO DCP IF YES.
                              748
                              749 * ROUTINE 10 ERROR MESSAGE *
                              750
   1008 C0 87 021A            751        B     PRINT             PRINT RESET CHECK.
   100C C2              100C  752        DC    XL1'C2'
   100D 1D              100D  753        DC    IL1'29'
   100E 1D48            100F  754        DC    AL2(INTR)
   1010 4013            1011  755        DC    XL2'4013'
   1012 C0 87 17D9            756        B     MAPS              POINT TO MAP CHART.
   1016 8971            1017  757        DC    XL2'8971'         -PAGE 897. ENTRY 1.
                              758
   101A C0 87 C222            759        B     HALT              ERROR HALT -13-.
   101C 4013            101D  760        DC    XL2'4013'
   101E C0 87 0216            761        B     LINK              RETURN TO DCP.
                              762
                              763
                              764 *********
                              765 * RTN11 *
                              766 ***************************************************************************
                              767 *                                                                         *
                              768 *       ROUTINE 11        ISSUE A READ COMMAND.                           *
                              769 *                                                                         *
                              770 ***************************************************************************
   1022 11              1022  771 RTN11  DC    XL1'11'           ROUTINE NUMBER
   1023 00              1023  772        DC    XL1'00'           NO MANUAL INTERVENTION REQUIRED
   1024 108A            1025  773        DC    AL2(RTN12)        ROUTINE 12 ADDRESS
                              774
   1026 C0 87 1576            775        B     SICMD             PRINT TEST HEADING.
   102A B1              102A  776        DC    XL1'B1'           MESSAGE ID.
   102B E2C5E340D5C5C1C4 1047 777        DC    CL29'SET READ CALL LATCH.'
   1033 40C3C1D3D340D3C1      777
   103B E3C3CE4B4040404C      777
   1043 404040404C            777
   1048 C1 42 17BF            778        TIO   DRCPD,X'42'       MAKE SURE 3741 IS NOT BUSY.
                              779
   104C C0 87 175D            780        B     QUES              TEST FOR SSW 10.
   1050 F0 3C 3C              781        HPL   X'3C',X'3C'       HALT -FF- IF ON.
                              782
   1053 31 41 18DE            783        LIO   HOC80,X'41'       SET TO DIAGNOSTIC MODE.
   1057 F3 41 00              784        SIO   X'C0',X'41'       ISSUS A READ CALL.
   105A C1 42 17BF            785        TIO   TICERB,X'42'      BRANCH IF 3741 BUSY.
   105E 30 45 18FC            786        SNS   DTF,X'45'         SENSE DIAG BYTE FOR -03-.
                              787
   1062 3C 03 191C            788        MVI   XPCT,X'03'        STORE EXPECTED RESULT.
   1066 C0 87 15B0            789        B     CKSIO             GO CHECK EXPECTED WITH RESULT.
   106A 14              106A  790        DC    XL1'14'           ERROR ID.
   106B C0 87 107F            791        B     DORST             GO CHECK FOR RESET IF OK.
                              792
   106F C0 87 17D9            793        B     MAPS              POINT TO MAP CHART.
   1073 8991            1074  794        DC    XL2'8991'         -PAGE 899. ENTRY 1.
   1075 C0 87 0222            795        B     HALT              ERROR HALT -14-.
   1079 4014            107A  796        DC    XL2'4014'
   107B C0 87 0216            797        B     LINK              RETURN TO DCP.
                              798
   107F F3 40 08              799 DORST  SIO   X'C8',X'40'       DO A READ CALL RESET.
   1082 30 45 18FE            800        SNS   TEMP,X'45'        SENSE DIAG BYTE FOR -00-.
   1086 C0 87 10EA            801        B     CKRST             GO CHECK DIAG BYTE FOR RESET.
                              802
```


4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              803
                              804 *********
                              805 * RTN12 *
                              806 ***************************************************************************
                              807 *                                                                         *
                              808 *       ROUTINE 12        ISSUE A WRITE COMMAND.                          *
                              809 *                                                                         *
                              810 ***************************************************************************
   108A 12              108A  811 RTN12  DC    XL1'12'           ROUTINE NUMBER
   108B 00              108B  812        DC    XL1'00'           NO MANUAL INTERVENTION
   108C 1118            108D  813        DC    AL2(RTN13)        ROUTINE 13 ADDRESS
                              814
   108E C0 87 157E            815        B     SICMD             PRINT TEST HEADING.
   1092 B2              1092  816        DC    XL1'B2'           MESSAGE ID.
   1093 E2C5E340E6D9C5E3 10AF 817        DC    CL29'SET WRITE CALL LATCH.'
   1098 C540C3C1D3D340E3      817
   10A3 C1E3C3CE4E4C4040      817
   10AB 404040404040          817
   10B0 C1 42 17BF            818        TIO   DRCPD,X'42'       MAKE SURE 3741 IS NOT BUSY.
                              819
   10B4 C0 87 175D            820        B     QUES              TEST FOR SSW 10.
   10B8 F0 3C 3C              821        HPL   X'3C',X'3C'       HALT -FF- IF ON.
                              822
   10BB 31 41 18DE            823        LIO   HOC80,X'41'       SET TO DIAGNOSTIC MODE.
   10BF F3 42 00              824        SIO   X'00',X'42'       ISSUE A WRITE CALL.
   10C2 30 45 18FC            825        SNS   DTF,X'45'         SENSE DIAG BYTE FOR -05-.
                              826
   10C6 3C 05 191C            827        MVI   XPCT,X'05'        STORE EXPECTED RESULT.
   10CA C0 87 15B0            828        B     CKSIO             GO CHECK EXPECTED WITH RESULT.
   10CE 15              10CE  829        DC    XL1'15'           ERROR ID.
   10CF C0 87 10E3            830        B     CKRSTT            GO DO RESET IF OK.
                              831
   10D3 C0 87 17D9            832        B     MAPS              POINT TO MAP CHART.
   10D7 9031            10D8  833        DC    XL2'9031'         -PAGE 903. ENTRY 1.
   10D9 C0 87 0222            834        B     HALT              ERROR HALT -15-.
   10DD 4015            10DE  835        DC    XL2'4015'
   10DF C0 87 0216            836        B     LINK              RETURN TO DCP.
                              837
   10E3 F3 40 08              838 CKRSTT SIO   X'C8',X'4C'       DO WRITE CALL RESET.
   10E6 30 45 18FE            839        SNS   TEMP,X'45'        SENSE DIAG BYTE FOR -00-.
                              840
   10EA 3D 00 18FD            841 CKRST  CLI   TEMP-1,X'C0'     DIAG BYTE RESET TO -00- ?
   10EE F2 01 0D              842        JNE   ERST              JUMP IF NOT.
   10F1 3D 15 0A03            843        CLI   RTN#,X'15'        CHECKING RESET FROM RTN15?
   10F5 C0 01 0216            844        BNE   LINK              RETURN TO DCP IF NOT.
                              845
   10F9 C0 87 022A            846        B     LOAD              BRANCH TO DCP TO TERMINATE SECTION.
   10FD 00              10FD  847        DC    XL1'00'
                              848
                              849 * 3741 RESET ERROR MESSAGE *
                              850
   10FE C0 87 021A            851 ERST   B     PRINT             PRINT 3741 NOT RESETTING MESSAGE.
   1102 C2              1102  852        DC    XL1'C2'
   1103 1B              1103  853        DC    IL1'27'
   1104 1D2B            1105  854        DC    AL2(NTRST)
   1106 4016            1107  855        DC    XL2'4016'
   1108 C0 87 17D9            856        B     MAPS              POINT TO MAP CHART.
   110C 8992            110D  857        DC    XL2'8992'         -PAGE 899. ENTRY 2.
   110E C0 87 0222            858        B     HALT              ERROR HALT -16-.
   1112 4016            1113  859        DC    XL2'4016'
   1114 C0 87 0216            860        B     LINK              RETURN TO DCP.
```

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              862 *********
                              863 * RTN13 *
                              864 ************************************************************************
                              865 *                                                                      *
                              866 *      ROUTINE 13        ISSUE A CONTROL 1 SIO.                        *
                              867 *                                                                      *
                              868 ************************************************************************
  111F 13                1118 869 RTN13  DC    XL1'13'             ROUTINE NUMBER
  1119 00                1119 870        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
  111A 11E4              111B 871        DC    AL2(RTN14)          ROUTINE 14 ADDRESS
                              872
  111C C0 87 1576              873        B     SIOHD               PRINT TEST HEADING.
  1120 83                1120 874        DC    XL1'83'             MESSAGE ID.
  1121 C4D640C3D6D5E3D9 113D 875        DC    CL29'DO CONTROL 1 START I/O.'
  1129 D6D340F140E2E3C1      875
  1131 D5E34CC9E1D64B40      875
  1139 4040404040            875
  113E C1 42 17BF              876        TIO   DROPD,X'42'         MAKE SURE 3741 IS NOT BUSY.
                               877
  1142 C0 87 175D              878        B     QUES                TEST FOR SSW 10.
  1146 F0 3C 3C                879        HPL   X'3C',X'3C'         HALT -FF- IF ON.
                               880
  1149 31 41 18DE              881        LIO   H0C80,X'41'         SET TO DIAGNOSTIC MODE.
  114D F3 43 FF                882        SIO   X'FF',X'43'         ISSUE CONTROL 1 SIO.
                               883
  1150 C0 87 0216              884        B     LINK                RETURN TO DCP.
                               885
                               886
                               887 *********
                               888 * RTN14 *
                               889 ************************************************************************
                               890 *                                                                      *
                               891 *      ROUTINE 14        ISSUE CONTROL 2 SIO.                          *
                               892 *                                                                      *
                               893 ************************************************************************
  1154 14                1154 894 RTN14  DC    XL1'14'             ROUTINE NUMBER
  1155 00                1155 895        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
  1156 1190              1157 896        DC    AL2(RTN15)          ROUTINE 15 ADDRESS
                              897
  1158 C0 87 1576              898        B     SIOHD               PRINT TEST HEADING.
  115C B4                115C 899        DC    XL1'B4'             MESSAGE ID.
  115D C4D640C3D6D5E3D9 1179 900        DC    CL29'DO CONTROL 2 START I/O.'
  1165 D6D340F240E2E3C1      900
  116D D9E340C961D64B40      900
  1175 4C4C4C4040            900
  117A C0 87 175D              901        B     QUES                TEST FOR SSW 10.
  117E F0 3C 3C                902        HPL   X'3C',X'3C'         HALT -FF- IF ON.
                               903
  1181 31 41 18CE              904        LIC   H0C00,X'41'         REMOVE FROM DIAGNOSTIC MODE.
  1185 C1 42 17BF              905        TIO   DROPD,X'42'         MAKE SURE 3741 IS NOT BUSY.
  1189 F3 44 FF                906        SIC   X'FF',X'44'         ISSUE CONTROL 2 SIO.
                               907
  118C C0 87 0216              908        B     LINK                RETURN TO DCP.
                               909
                               910
                               911 *********
                               912 * RTN15 *
                               913 ************************************************************************
                               914 *                                                                      *
                               915 *      ROUTINE 15        ISSUE A SIO TO SET/RESET THE NO-OP LATCH.     *
                               916 *                                                                      *
                               917 ************************************************************************
  1190 15                1190 918 RTN15  DC    XL1'15'             ROUTINE NUMBER
  1191 00                1191 919        DC    XL1'00'             NO INTERVENTION REQUIRED
  1192 1223              1193 920        DC    AL2(RTN16)          ROUTINE 16 ADDRESS
                              921
  1194 C0 87 1576              922        B     SIOHD               PRINT TEST HEADING.
  1198 85                1198 923        DC    XL1'85'             MESSAGE ID.
```


4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  1199 E2C5E340C1D5C440 1185  924        DC    CL29'SET AND RESET NO-OP LATCH.'
  11A1 D9C5E2C5E340D5D6       924
  11A9 60D6D740D3C1E3C3       924
  11B1 C84B404040             924
  11B6 C1 42 17BF             925        TIO   DROPD,X'42'         MAKE SURE 3741 IS NOT BUSY.
                              926
  11BA C0 87 175D             927        B     QUES                TEST FOR SSW 10.
  11BE F0 3C 3C               928        HPL   X'3C',X'3C'         HALT -FF- IF ON.
                              929
  11C1 31 41 18CE             930        LIC   H0000,X'41'         REMOVE FROM DIAG MODE.
  11C5 F3 41 00               931        SIO   X'00',X'41'         ISSUE A READ CALL.
  11C8 30 42 0AE6             932        SNS   LCR,X'42'           SENSE STATUS FOR -84-.
  11CC 38 04 0AEA             933        TBN   LCR-1,X'04'         NO-OP BIT ON IN FIRST STATUS ?
  11D0 F2 90 35               934        JF    E13                 BRANCH IF NO-OP NOT ON.
                              935
  11D3 30 42 190D             936        SNS   WORK,X'42'          SENSE STATUS FOR -80-.
  11D7 38 04 190C             937        TBN   WORK-1,X'04'        NO-OP BIT RESET ?
  11DB F2 10 0F               938        JT    E13A                BRANCH IF NO-OP NOT RESET.
  11DE C1 42 17BF             939        TIO   TICERB,X'42'        BRANCH OUT IF 3741 BUSY.
                              940
  11E2 F3 40 C8               941        SIO   X'C8',X'40'         DO READ CALL RESET.
  11E5 30 45 18FE             942        SNS   TEMP,X'45'          SENSE DIAG BYTE FOR -00-.
  11E9 C0 87 10EA             943        B     CKRST               GO CHECK RESET RESULTS.
                              944
                              945 * ROUTINE 15 ERROR MESSAGES *
                              946
  11EC C0 87 021A             947 E13A   B     PRINT               PRINT NO RESET ERROR.
  11F1 C2               11F1  948        DC    XL1'C2'
  11F2 1B               11F2  949        DC    IL1'27'
  11F3 1D7C             11F4  950        DC    AL2(NORES)
  11F5 4018             11F6  951        DC    XL2'4018'
  11F7 C0 87 17D9             952        B     MAPS                POINT TO MAP CHART.
  11FB 9052             11FC  953        DC    XL2'9052'           -PAGE 905, ENTRY 2.
  11FD C0 87 0222             954        B     HALT                ERROR HALT -18-.
  1201 4018             1202  955        DC    XL2'4018'
  1203 C0 87 022A             956        B     LOAD                GO TERMINATE SECTION.
  1207 00               1207  957        DC    XL1'00'
                              958
  1208 C0 87 021A             959 E13    B     PRINT               PRINT LATCH SET CHECK.
  120C C2               120C  960        DC    XL1'C2'
  120D 19               120D  961        DC    IL1'25'
  120E 1D61             120F  962        DC    AL2(NDSEE)
  1210 4017             1211  963        DC    XL2'4017'
  1212 C0 87 17D9             964        B     MAPS                POINT TO MAP CHART.
  1216 9051             1217  965        DC    XL2'9051'           -PAGE 905, ENTRY 1.
  1218 C0 87 0222             966        B     HALT                ERROR HALT -17-.
  121C 4017             121D  967        DC    XL2'4017'
  121E C0 87 022A             968        B     LOAD                GO TERMINATE SECTION.
  1222 00               1222  969        DC    XL1'00'
                              970
                              971
                              972 *********
                              973 * RTN16 *
                              974 ************************************************************************
                              975 *                                                                      *
                              976 *      ROUTINE 16        TEST ALL INVALID N CODE COMMANDS.             *
                              977 *                                (DIAL IN ONLY)                        *
                              978 ************************************************************************
  1223 16               1223  979 RTN16  DC    XL1'16'             ROUTINE NUMBER
  1224 80               1224  980        DC    XL1'80'             MANUAL INTERVENTION REQUIRED
  1225 FFFF             1226  981        DC    XL2'FFFF'           LAST ROUTINE
                              982
  1227 0C 03 190D 0003        983        MVC   WORK(4),3           SAVE BOTTOM CORE OF DCP.
  122D 0C 03 0003 18F6        984        MVC   3(4),BRNCH          STORE SPECIAL 'BRANCH BACK' CMND.
                              985
  1233 C0 87 021A             986        B     PRINT               PRINT TEST HEADING.
  1237 42               1237  987        DC    XL1'42'
  1238 33               1238  988        DC    IL1'51'
```

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    1239 1DDC            123A  989        DC    AL2(INVAL)
    123B 40B6            123C  990        DC    XL2'40B6'
    123D C0 87 021A            991 REPIT  B     PRINT          PRINT REST OF INSTRUCTIONS.
    1241 02              1241  992        DC    XL1'02'
    1242 24              1242  993        DC    IL1'36'
    1243 1E01            1244  994        DC    AL2(INVL)
    1245 C0 87 021A            995        B     PRINT
    1249 0E              1249  996        DC    XL1'06'
    124A 37              124A  997        DC    IL1'55'
    124B 1E3E            124C  998        DC    AL2(IVL)
                               999
    124D C0 87 0222           1000        B     HALT           OPERATOR HALT -EE-.
    1251 40EE            1252 1001        DC    XL2'40EE'
                              1002
    1253 C0 87 123D           1003        B     REFIT          REPEAT IF NO SYSTEM RESET.
                              1004
                              1005 *      INVALID SENSE I/C CODES.
    1257 0E 01 0003 18DA      1006 RTRN   ALC   3(2),N019      INCR RETURN ADDRESS.
    125D 3C 40 18FE           1007        SNS   TEMP,X'40'     N = 0.
    1261 C0 87 137B           1008        B     ER14           BRANCH IF CMND ACCEPTED.
    1265 E2D5E240F0      1269 1009        DC    CL5'SNS 0'
                              1010
    126A 0E 01 0003 18DA      1011        ALC   3(2),N019      INCR RETURN ADDRESS.
    1270 3C 46 18FE           1012        SNS   TEMP,X'46'     N = 6.
    1274 C0 87 137B           1013        B     ER14           BRANCH IF CMND ACCEPTED.
    1278 E2D5E240F6      127C 1014        DC    CL5'SNS 6'
                              1015
    127D 0E 01 0003 18DA      1016        ALC   3(2),N019      INCR RETURN ADDRESS.
    1283 3C 47 18FE           1017        SNS   TEMP,X'47'     N = 7.
    1287 C0 87 137B           1018        B     ER14           BRANCH IF CMND ACCEPTED.
    128B E2D5E240F7      128F 1019        DC    CL5'SNS 7'
                              1020
                              1021 *      INVALID LOAD I/O CODES.
    1290 0E 01 0003 18DA      1022        ALC   3(2),N019      INCR RETURN ADDRESS.
    1296 31 40 18CE           1023        LIO   H0000,X'40'    N = 0.
    129A C0 87 137B           1024        B     ER14           BRANCH IF CMND ACCEPTED.
    129E D3C9D640F0      12A2 1025        DC    CL5'LIO 0'
                              1026
    12A3 0E 01 0003 18DA      1027        ALC   3(2),N019      INCR RETURN ADDRESS.
    12A9 31 43 18CE           1028        LIO   H0C00,X'43'    N = 3.
    12AD C0 87 137B           1029        B     ER14           BRANCH IF CMND ACCEPTED.
    12B1 D3C9D640F3      12B5 1030        DC    CL5'LIO 3'
                              1031
    12B6 0E 01 0003 18DA      1032        ALC   3(2),N019      INCR RETURN ADDRESS.
    12BC 31 46 18CE           1033        LIO   H0C00,X'46'    N = 6.
    12C0 C0 87 137B           1034        B     ER14           BRANCH IF CMND ACCEPTED.
    12C4 D3C9D640F6      12C8 1035        DC    CL5'LIO 6'
                              1036
    12C9 0E 01 0003 18DA      1037        ALC   3(2),N019      INCR RETURN ADDRESS.
    12CF 31 47 18CE           1038        LIO   H0000,X'47'    N = 7.
    12D3 C0 87 137B           1039        B     ER14           BRANCH IF CMND ACCEPTED.
    12D7 D3C9D640F7      12DB 1040        DC    CL5'LIO 7'
                              1041
                              1042 *      INVALID TIO N CODES.
    12DC 0E 01 0003 18DA      1043        ALC   3(2),N019      INCR RETURN ADDRESS.
    12E2 C1 41 12E6           1044        TIO   **4,X'41'      N = 1.
    12E6 C0 87 137B           1045        B     ER14           BRANCH IF CMND ACCEPTED.
    12EA E3C9D640F1      12EE 1046        DC    CL5'TIO 1'
                              1047
    12EF 0E 01 0003 18DA      1048        ALC   3(2),N019      INCR RETURN ADDRESS.
    12F5 C1 44 12F9           1049        TIO   **4,X'44'      N = 4.
    12F9 C0 87 137B           1050        B     ER14           BRANCH IF CMND ACCEPTED.
    12FD E3C9D640F4      1301 1051        DC    CL5'TIO 4'
                              1052
    1302 0E 01 0003 18DA      1053        ALC   3(2),N019      INCR RETURN ADDRESS.
    1308 C1 45 130C           1054        TIO   **4,X'45'      N = 5.
    130C C0 87 137B           1055        B     ER14           BRANCH IF CMND ACCEPTED.
    1310 E3C9D640F5      1314 1056        DC    CL5'TIO 5'
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              1057
    1315 0E 01 0003 18DA      1058        ALC   3(2),N019      INCR RETURN ADDRESS.
    1318 C1 46 131F           1059        TIO   **4,X'46'      N = 6.
    131F C0 87 137B           1060        B     ER14           BRANCH IF CMND ACCEPTED.
    1323 E3C9D640F6      1327 1061        DC    CL5'TIO 6'
                              1062
    1328 0E 01 0003 18DA      1063        ALC   3(2),N019      INCR RETURN ADDRESS.
    132E C1 47 1332           1064        TIO   **4,X'47'      N = 7.
    1332 C0 87 137B           1065        B     ER14           BRANCH IF CMND ACCEPTED.
    1336 E3C9D640F7      133A 1066        DC    CL5'TIO 7'
                              1067
                              1068 *      INVALID SIO N CODES.
    133B 0E 01 0003 18D8      1069        ALC   3(2),N018      INCR RETURN ADDRESS.
    1341 F3 45 00             1070        SIO   X'00',X'45'    N = 5.
    1344 C0 87 137B           1071        B     ER14           BRANCH IF CMND ACCEPTED.
    1348 E2C9D640F5      134C 1072        DC    CL5'SIO 5'
                              1073
    134D 0E 01 0003 18D8      1074        ALC   3(2),N018      INCR RETURN ADDRESS.
    1353 F3 46 00             1075        SIO   X'00',X'46'    N = 6.
    1356 C0 87 137B           1076        B     ER14           BRANCH IF CMND ACCEPTED.
    135A E2C9D640F6      135E 1077        DC    CL5'SIO 6'
                              1078
    135F 0E 01 0003 18D8      1079        ALC   3(2),N018      INCR RETURN ADDRESS.
    1365 F3 47 00             1080        SIO   X'00',X'47'    N = 7.
    1368 C0 87 137B           1081        B     ER14           BRANCH IF CMND ACCEPTED.
    136C E2C9D640F7      1370 1082        DC    CL5'SIO 7'
                              1083
    1371 0C 03 0003 190D      1084 PUTBAK MVC   3(4),WORK      RESTORE BOTTOM CORE OF DCP.
    1377 C0 87 0216           1085        B     LINK           RETURN TO DCP.
                              1086
                              1087 * ROUTINE 16 ERROR MESSAGE *
                              1088
    137B 36 08 18D6           1089 ER14   A     N0C4,ARR
    137F 34 08 1388           1090        ST    **8,ARR
    1383 0C 04 1E5C 0000      1091        MVC   FLWNG(5),*-*   STORE FAILING CMND ID.
    1389 0C 23 1F12 1E5C      1092        MVC   PRT-55(36),FLWNG  SET UP ERROR MESSAGE.
    138F 0C 00 1CE5 1E5C      1093        MVC   THD-1(1),FLWNG
    1395 0C 08 1F1A 1CE6      1094        MVC   PRT-47(9),THD
    139B C0 87 021A           1095        B     PRINT          PRINT ERROR MESSAGE.
    139F C2              13AF 1096        DC    XL1'C2'
    13A0 5B              13A0 1097        DC    IL1'91'
    13A1 1F49            13A2 1098        DC    AL2(PRT)
    13A3 4019            13A4 1099        DC    XL2'4019'
    13A5 0C 5A 1F49 1F4A      1100        MVC   PRT(91),PRT+1  CLEAR PRINT FIELD.
    13AB C0 87 17D9           1101        B     MAPS           POINT TO MAP CHART.
    13AF 9053            13B0 1102        DC    XL2'9053'
    13B1 C0 87 0222           1103        B     HALT           ERROR HALT -19-.
    13B5 4019            13B6 1104        DC    XL2'4019'
    13B7 C0 87 1371           1105        B     PUTBAK         GO RETURN TO DCP.
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         1107 ********************************************************************************
                         1108 * SNSERR *                                                                     *
                         1109 **********              SUBROUTINE PRINTS SENSE ERROR HEADING                 *
                         1110 *                       AND DUMPS STATUS/ERRORS OF THE REGISTERS.             *
                         1111 *                       CALL SUBROUTINE BY -                                  *
                         1112 *                                                                             *
                         1113 *                       B     SNSERR                                          *
                         1114 *                       DC    2.X'EXPECTED PATTERN'                           *
                         1115 *                       DC    2.X'ACTUAL PATTERN'                             *
                         1116 *                       DC    1.X'ERROR ID'                                   *
                         1117 *                                                                             *
                         1118 ********************************************************************************
   13EE 36 08 18D0       1119 SNSERR A     N001.ARR
   13F2 34 CE 13CE       1120        ST    **+9.ARR
   13C3 0C 01 163C 0000  1121        MVC   XPT(2).*-*          STORE EXPECTED PATTERN.
   13C9 36 08 18D2       1122        A     N002.ARR
   13CD 34 0E 13D6       1123        ST    **+9.ARR
   13D1 0C 01 163E 0000  1124        MVC   ACT(2).*-*          STORE ACTUAL PATTERN.
   13D7 36 08 18D0       1125        A     N001.ARR
   13DB 34 0E 13E4       1126        ST    **+9.ARR
   13DF 0C 00 13F6 0000  1127        MVC   SNRID(1).*-*        STORE ERROR ID.
   13E5 36 08 18D0       1128        A     N001.ARR
   13E9 34 0E 1487       1129        ST    ERSN+3.ARR          STORE RETURN ADDRESS.
                         1130
   13ED C0 E7 021A       1131        B     PRINT               PRINT ERROR HEADING.
   13F1 C2               13F1 1132   DC    XL1'C2'              ID -4003- OR -4004- OR -4005-.
   13F2 0C               13F2 1133   DC    IL1'12'
   13F3 1E72             13F4 1134   DC    AL2(SNCKMS)
   13F5 4000             13F6 1135 SNRID DC  XL2'4000'
                         1136
   13F7 3D 03 0A03       1137        CLI   RTN#.X'03'          FROM RTN03 ERROR ?
   13F9 F2 01 0C         1138        JNE   *+15                JUMP IF NOT.
   13FE 0C 0A 1F04 1AAE  1139        MVC   PRT-69(11).STLCR-22 LOAD RTN03 ERROR HEADING.
   1404 0C 0F 1F1E 1ABF  1140        MVC   PRT-46(16).STLCR-5
   140A 3D 04 0A03       1141        CLI   RTN#.X'04'          FROM RTN04 ERROR ?
   140E F2 01 06         1142        JNE   *+9                 JUMP IF NOT.
   1411 0C 11 1F12 1AD6  1143        MVC   PRT-55(18).IOTRL    LOAD RTN04 ERROR HEADING.
   1417 3D 05 0A03       1144        CLI   RTN#.X'05'          FROM RTN05 ERROR ?
   141B F2 01 06         1145        JNE   *+9                 JUMP IF NOT.
   141E 0C 0E 1F06 1BCA  1146        MVC   PRT-67(15).DIAG     LOAD RTN05 ERROR HEADING.
   1424 C0 E7 18A7       1147        B     EPRNT2              PRINT HEADING.
                         1148
   1428 C2 02 1F06       1149        LA    PRT-67.XR2          INITIALIZE OUTPUT ADDRESSES.
   142C 3D 05 0A03       1150        CLI   RTN#.X'05'          FROM ROUTINE 05 ?
   1430 F2 01 07         1151        JNE   NORM                JUMP IF NOT SO.
   1433 C2 01 190D       1152        LA    WORK.XR1            SET UP DUMMY EB1 FIELD.
   1437 F2 E7 04         1153        J     *+7
   143A C2 01 1F1A       1154 NORM   LA    PRT-47.XR1          SET UP NORMAL EB1 FIELD.
                         1155
   143E 0C 09 1F03 1DC9  1156        MVC   PRT-70(10).EB2      ARRANGE TABLE HEADINGS.
   1444 3D 05 0A03       1157        CLI   RTN#.X'05'          FROM ROUTINE 05 ?
   1448 F2 81 06         1158        JE    *+9                 SKIP IF SO.
   144B 0C 09 1F17 1CFF  1159        MVC   PRT-50(10).EB1
   1451 C0 E7 189C       1160        B     EPRNT1              PRINT EB BYTE LABLES.
                         1161
   1455 0C 0E 1F06 1CF5  1162        MVC   PRT-67(15).BITS     ARRANGE BIT LABLES.
   145B 3D 05 0A03       1163        CLI   RTN#.X'05'          FROM ROUTINE 05 ?
   145F F2 81 C6         1164        JE    *+9                 SKIP IF SO.
   1462 0C 0E 1F1A 1CF5  1165        MVC   PRT-47(15).BITS
   1468 C0 E7 18A7       1166        B     EPRNT2              PRINT BIT LABLES.
                         1167
   146C C0 E7 16E1       1168        B     BITSNF              CALCULATE STATUS OF ALL ACTUAL BITS.
   1470 163E             1471 1169   DC    AL2(ACT)
   1472 C0 E7 189C       1170        B     EPRNT1              GO PRINT ACTUAL STATUS.
   1476 C0 E7 163F       1171        B     CMPARE              FIGURE ERROR BITS.
   147A 0C 06 1EF5 1D10  1172        MVC   PRT-84(7).ERORS     MOVE IN ERROR LABLE.
   1480 C0 E7 18A7       1173        B     EPRNT2              PRINT ERROR BITS.
   1484 C0 E7 0000       1174 ERSN   B     *-*                 RETURN TO ROUTINE.
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         1176 ********************************************************************************
                         1177 * LIOSNS *                                                                     *
                         1178 **********              THE EXPECTED AND ACTUAL SNS PATTERNS                  *
                         1179 *                       ARE COMPARED FROM ROUTINES 07-0E.                     *
                         1180 *                                                                             *
                         1181 ********************************************************************************
   1488 36 08 18D0       1182 LIOSNS A     N001.ARR
   148C 34 CE 1495       1183        ST    **+9.ARR
   1490 0C 01 1918 0000  1184        MVC   NIC(2).*-*          SAVE THE N CODE. ERROR ID.
   1496 36 08 18D0       1185        A     NC01.ARR
   149A 34 08 14AA       1186        ST    CKKLS+3.ARR         SAVE RETURN ADDRESS.
                         1187
   149E 0D 01 1917 1919  1188        CLC   LSCK(2).PATRN       EXPECTED AND ACTUAL EQUAL ?
   14A4 F2 01 04         1189        JNE   **7                 JUMP IF NOT.
   14A7 C0 87 0000       1190 CKKLS  B     *-*                 RETURN TO ROUTINE.
                         1191
   14AE 0C 00 14EA 191A  1192        MVC   LSID(1).NID-1       STORE CURRENT ERROR ID.
   14B1 C0 87 021A       1193        B     PRINT               PRINT ERROR HEADING.
   14B5 C2               1485 1194   DC    XL1'C2'
   14B6 16               1486 1195   DC    IL1'22'
   14B7 1BE0             1499 1196   DC    AL2(LSCKK)
   14E9 4000             14BA 1197 LSID  DC  XL2'4000'
   14BB 3D F1 1918       1198        CLI   NIC.X'F1'           N CODE 1 CHECK ?
   14BF F2 01 06         1199        JNE   **9                 JUMP IF NOT.
   14C2 0C 10 1F12 19BC  1200        MVC   PRT-55(17).FNCT     MOVE IN N 1 ID.
   14C8 3D F2 1918       1201        CLI   NIC.X'F2'           N CODE 2 CHECK ?
   14CC F2 01 06         1202        JNE   **9                 JUMP IF NOT.
   14CF 0C 0F 1F07 1A8F  1203        MVC   PRT-66(16).STLCR-5  MOVE IN N 2 ID.
   14D5 3D F4 1918       1204        CLI   NIC.X'F4'           N CODE 4 ID ?
   14D9 F2 01 C6         1205        JNE   **5                 JUMP IF NOT.
   14DC 0C 14 1F13 1AEB  1206        MVC   PRT-54(21).DADR     MOVE IN N 4 ID.
   14E2 3D F5 1918       1207        CLI   NIC.X'F5'           N CODE 5 CHECK ?
   14E6 F2 01 06         1208        JNE   **5                 JUMP IF NOT.
   14E9 0C 10 1F07 1B0C  1209        MVC   PRT-66(17).DIGTR-5  MOVE IN N 5 ID.
   14EF C0 E7 18A7       1210        B     EPRNT2              PRINT HEADING.
   14F3 3D F2 1918       1211        CLI   NIC.X'F2'           N CODE 2 CHECK ?
   14F7 F2 81 32         1212        JE    SPL2                JUMP IF SO.
   14FA 3D F5 1918       1213        CLI   NIC.X'F5'           N CODE 5 CHECK ?
   14FE F2 81 28         1214        JE    SPL2                JUMP IF SO.
   1501 0C 09 1F03 1D09  1215        MVC   PRT-70(10).EB2      SET UP BYTE LABLES.
   1507 0C 09 1F17 1CFF  1216        MVC   PRT-50(10).EB1
   150D C0 E7 189C       1217        B     EPRNT1              PRINT BYTE LABLES.
   1511 0C 0E 1F06 1CF5  1218        MVC   PRT-67(15).BITS     SET UP BIT LABLES.
   1517 0C 0E 1F1A 1CF5  1219        MVC   PRT-47(15).BITS
   151D C0 E7 18A7       1220        B     EPRNT2              PRINT BIT LABLES.
   1521 C2 02 1F06       1221        LA    PRT-67.XR2          LOAD OUTPUT ADDRESS.
   1525 C2 01 1F1A       1222        LA    PRT-47.XR1
   1529 F2 E7 1C         1223        J     CALC
   152C 0C 09 1F03 1CFF  1224 SPL2   MVC   PRT-70(10).EB1
   1532 C0 E7 189C       1225        B     EPRNT1              PRINT EB1 HEADING.
   1536 0C 0E 1F06 1CF5  1226        MVC   PRT-67(15).BITS
   153C C0 E7 18A7       1227        B     EPRNT2              PRINT BIT HEADINGS.
   1540 C2 01 1F06       1228        LA    PRT-67.XR1          STORE OUTPUT ADDRESSES.
   1544 C2 C2 190D       1229        LA    WORK.XR2
   1548 C0 E7 16E1       1230 CALC   B     BITSNF              CALCULATE BIT STATUS OF BYTES.
   154C 1917             154D 1231   DC    AL2(LSCK)
   154E C0 E7 189C       1232        B     EPRNT1              PRINT BIT STATUS.
   1552 0C 01 163C 1919  1233        MVC   XPT(2).PATRN        STORE EXPECTED PATTERN.
   1558 0C 01 163E 1917  1234        MVC   ACT(2).LSCK         STORE ACTUAL PATTERN.
   155E C0 E7 163F       1235        B     CMPARE              CALCULATE ERROR BITS.
   1562 0C 06 1EF5 1D10  1236        MVC   PRT-84(7).ERORS     MOVE ERROR LABLE IN.
   1568 C0 E7 18A7       1237        B     EPRNT2              PRINT ERROR BITS.
                         1238
   156C 0E 01 14AA 18D6  1239 ADDIT  ALC   CKKLS+3(2).N004     INCR RETURN ADDRESS TO BRANCH
   1572 C0 E7 14A7       1240        B     CKKLS                TO ERROR HALT IN ROUTINE.
```

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1242 ********************************************************************************
                         1243 * SIOHD *                                                                      *
                         1244 *********          TEST HEADINGS AND ERROR MESSAGES                            *
                         1245 *                   ARE PRINTED FOR ROUTINES 0D - 13.                          *
                         1246 *                                                                              *
                         1247 ********************************************************************************
  157E 34 08 157F        1248 SIOHD  ST    **$,ARR
  157A 0C 00 15A5 0000   1249       MVC   SID(1),*-*          STORE MESSAGE HEADING ID.
  1580 36 08 18DC        1250       A     N029,ARR
  15E4 34 08 158D        1251       ST    **$,ARR
  1588 0C 1C 1F1B C000   1252       MVC   PRT-46(29),*-*      STORE ROUTINE HEADING.
  158E 36 08 18D0        1253       A     N0C1,ARR
  1592 34 C8 15AF        1254       ST    SHCD+3,ARR          STORE RETURN ADDRESS.
                         1255
  1596 0C 0F 1EFE 1C31   1256       MVC   PRT-75(16),TSID     BUILD UP REST OF HEADING.
  159C C0 87 021A        1257       B     PRINT               PRINT ROUTINE TEST HEADING.
  15A0 45          15A0  1258       DC    XL1'45'
  15A1 5B          15A1  1259       DC    IL1'91'
  15A2 1F4S        15A3  1260       DC    AL2(PRT)
  15A4 4000        15A5  1261 SID    DC    XL2'4000'
  15A6 0C 5A 1F49 1F4A   1262       MVC   PRT(91),PRT+1       CLEAR PRINT AREA.
  15AC C0 87 0000        1263 SHDD   B     *-*                 RETURN TO ROUTINE.
                         1264
                         1265 * ROUTINE 0D-13 ERROR MESSAGE *
                         1266
  15B0 34 08 15B9        1267 CKSIO  ST    **$,ARR
  15B4 0C 00 15D4 0000   1268       MVC   SERID(1),*-*        STORE ERROR ID.
  15BA 36 08 18D0        1269       A     N0C1,ARR
  15BE 34 08 163A        1270       ST    CKS+3,ARR           STORE RETURN ADDRESS.
                         1271
  15C2 0D 00 191C 18FB   1272       CLC   XPCT(1),DTR-1       EXPECTED AND ACTUAL EQUAL ?
  15C8 F2 81 6C          1273       JE    CKS                 JUMP IF SO.
                         1274
  15CB C0 87 021A        1275       B     PRINT               PRINT ERROR HEADING.
  15CF C2          15CF  1276       DC    XL1'C2'
  15D0 16          15D0  1277       DC    IL1'22'
  15D1 1C21        15D2  1278       DC    AL2(SIOCK)
  15D3 4005        15D4  1279 SERID  DC    XL2'4005'
                         1280
  15D5 0C 5A 1F49 1F4A   1281       MVC   PRT(91),PRT+1
  15DB 0C 0E 1F06 18CA   1282       MVC   PRT-67(15),DIAG     MOVE IN DIAG BYTE LABLE.
  15E1 C0 87 18A7        1283       B     EPRNT2              PRINT LABLE.
  15E5 0C 09 1F03 1D05   1284       MVC   PRT-70(10),EB2      BRING IN EB2 LABLE.
  15EB C0 87 189C        1285       B     EPRNT1              PRINT LABLE.
  15EF 0C 0E 1F06 1CF5   1286       MVC   PRT-67(15),BITS     MOVE IN BIT HEADINGS.
  15F5 C0 87 18A7        1287       B     EPRNT2              PRINT HEADINGS.
                         1288
  15F9 C2 02 1F06        1289       LA    PRT-67,XR2          LOAD OUTPUT ADDRESSES.
  15FD C2 01 1F1A        1290       LA    PRT-47,XR1
  1601 C0 87 16E1        1291       B     BITSNF              CALCULATE STATUS OF ALL BITS.
  1605 18FC        1606  1292       DC    AL2(DTR)
  1607 0C 0E 1F1A 1F1B   1293       MVC   PRT-47(15),PRT-46   CLEAR EB1 STATUS.
  160D C0 87 189C        1294       B     EPRNT1              PRINT BIT STATUS OF DIAG BYTE.
                         1295
  1611 0C 00 163B 191C   1296       MVC   XPT-1(1),XPCT       STORE EXPECTED PATTERN.
  1617 0C 01 163E 18FC   1297       MVC   ACT(2),DTR          STORE ACTUAL PATTERN.
  161D C0 87 163F        1298       B     CMPARE              CALCULATE ERROR BITS.
  1621 0C 06 1EF5 1D10   1299       MVC   PRT-84(7),ERORS     MOVE IN ERROR LABLE.
  1627 0C 0E 1F1A 1F1B   1300       MVC   PRT-47(15),PRT-46
  162D C0 87 18A7        1301       B     EPRNT2              PRINT ERROR BITS.
                         1302
  1631 0E 01 163A 18D6   1303       ALC   CKS+3(2),N004       INCR RETURN ADDRESS TO RETURN
  1637 C0 87 0000        1304 CKS    B     *-*                  TO ERROR HALT.
```


4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1306 ********************************************************************************
                         1307 * CMPARE *                                                                      *
                         1308 *********          EXPECTED EB1 & EB2 BYTES IN 'XPT' ARE                       *
                         1309 *                   COMPARED AGAINST ACTUAL EB1 & EB2 BYTES                    *
                         1310 *                   IN 'ACT'.  ERROR BITS ARE IDENTIFIED BY                    *
                         1311 *                   A -*- IN THE OUTPUT AREA.                                  *
                         1312 *                                                                              *
                         1313 ********************************************************************************
  163B 0000              163C 1314 XPT    DC    XL2'0000'           EXPECTED EB1 & EB2 BYTES.
  163D 0000              163E 1315 ACT    DC    XL2'0000'           ACTUAL EB1 & EB2 BYTES.
                              1316
  163F 34 08 169A        1317 CMPARE ST    CMPR+3,ARR          STORE RETURN ADDRESS.
  1643 34 02 16D2        1318       ST    TAERR+3,XR2         INITIALIZE OUTPUT ADDRESSES.
  1647 34 01 16DA        1319       ST    TBERR+3,XR1
  164B 3C 01 1664        1320       MVI   TA3+1,X'01'         INITIALIZE BIT POINTERS.
  164F 3C 01 166B        1321       MVI   TA2+1,X'01'
  1653 3C 01 1675        1322       MVI   TA1+1,X'01'
  1657 3C 01 167C        1323       MVI   TB3+1,X'01'
  165B 3C 01 1683        1324       MVI   TB2+1,X'01'
  165F 3C 01 168D        1325       MVI   TB1+1,X'01'
                         1326
  1663 38 01 163B        1327 TA3    TBN   XPT-1,X'01'         EXPECTED BIT ON IN EB2 BYTE ?
  1667 F2 10 0A          1328       JT    TA1                 JUMP IF YES.
  166A 38 01 163D        1329 TA2    TBN   ACT-1,X'01'         ACTUAL BIT ON IN EB2 BYTE ?
  166E F2 10 5E          1330       JT    TAERR               GO PUT AN -*- IN OUTPUT IF ON.
  1671 F2 87 07          1331       J     TB2                 CHECK EB1 BYTE.
                         1332
  1674 38 01 163D        1333 TA1    TBN   ACT-1,X'01'         ACTUAL BIT ON IN EB2 BYTE ?
  1678 F2 90 5A          1334       JF    TAERR               GO PUT AN -*- IN OUTPUT IF OFF.
                         1335
  1678 38 01 163C        1335 TB3    TBN   XPT,X'01'           EXPECTED BIT ON IN EB1 BYTE ?
  167F F2 10 0A          1337       JT    TB1                 JUMP IF SO.
  1682 38 01 163E        1338 TB2    TBN   ACT,X'01'           ACTUAL BIT ON IN EB1 BYTE ?
  1686 F2 10 4E          1339       JT    TBERR               GO PUT AN -*- IN OUTPUT IF SO.
  1689 F2 87 C7          1340       J     TC                  CONTINUE ANALYSIS.
                         1341
  168C 38 01 163E        1342 TB1    TBN   ACT,X'01'           ACTUAL BIT ON IN EB1 BYTE ?
  1690 F2 C0 44          1343       JF    TBERR               GO PUT AN -*- IN OUTPUT IF OFF.
                         1344
  1693 38 80 168D        1345 TC     TBN   TB1+1,X'80'         BIT 0 BEEN TESTED ?
  1697 C0 10 0000        1346 CMPR   BT    *-*                 RETURN IF SO.
  169B 0E 00 1675 1675   1347       ALC   TA1+1(1),TA1+1      INCREMENT BIT POINTERS.
  16A1 0E 00 166B 166B   1348       ALC   TA2+1(1),TA2+1
  16A7 0E 00 1664 1664   1349       ALC   TA3+1(1),TA3+1
  16AD 0E 00 168D 168D   1350       ALC   TB1+1(1),TB1+1
  16B3 0E 00 1683 1683   1351       ALC   TB2+1(1),TB2+1
  16B9 0E 00 167C 167C   1352       ALC   TB3+1(1),TB3+1
  16BF 0F 01 16D2 18D2   1353       SLC   TAERR+3(2),N002     DECREMENT OUTPUT ADDRESSES.
  16C5 0F 01 16DA 18D2   1354       SLC   TBERR+3(2),N002
  16CB C0 87 1663        1355       B     TA3                 GO CHECK NEW BIT.
                         1356
  16CF 3C 5C 0000        1357 TAERR  MVI   *-*,X'5C'           PUT -*- IN EB2 OUTPUT.
  16D3 C0 87 167B        1358       B     TB3                 CONTINUE CHECK.
  16D7 3C 5C 0000        1359 TBERR  MVI   *-*,X'5C'           PUT -*- IN EB1 OUTPUT.
  16DB C0 87 1693        1360       B     TC                  CONTINUE CHECK.
                         1361
                         1362 ********************************************************************************
                         1363 * BITSNF *                                                                      *
                         1364 *********          THE EB1 & EB2 BYTES ARE CONVERTED                           *
                         1365 *                   TO A PRINTABLE BINARY FORM.                                *
                         1366 *                                                                              *
                         1367 ********************************************************************************
  16DF 00                16DF 1368 EB2T   DC    XL1'00'             TEMPORARY STORAGE FOR EB2 & EB1
  16E0 00                16E0 1369 EB1T   DC    XL1'00'              BYTES.
                         1370
  16E1 36 08 18D0        1371 BITSNF A     N0C1,ARR
  16E5 34 08 16EE        1372       ST    **$,ARR
  16E9 0C 01 16F4 0000   1373       MVC   **+11(2),*-*
```

4011 3741 FUNCTICN TEST WITHOUT THE WRAP CCNNECTOR

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    16EF 0C 01 16E0 0000       1374        MVC    EB1T(2),*-*              STORE EB1 & EB2 BYTES.
    16F5 36 08 18D0            1375        A      N001,ARR
    16F9 34 08 1740            1376        ST     BTNF+3,ARR               STCRE RETURN ADDRESS.
    16FD 3C 01 170E            1377        MVI    TNF+1,X'01'              INITIALIZE BIT POINTERS.
    1701 3C 01 1724            1378        MVI    TNFF+1,X'01'
    1705 34 02 1722            1379        ST     NF+3,XR2                 INITIALIZE OUTPUT ADDRESSES.
    1709 34 01 1738            1380        ST     NFF+3,XR1
                               1381
    170C 38 00 16DF            1382 TNF    TBN    EB2T,X'00'               THIS BIT ON IN EB2 ?
    1711 F2 10 07              1383        JT     ITSON                    JUMP IF SO.
    1714 3C F0 1720            1384        MVI    NF+1,X'F0'               MOVE IN A 0.
    1718 F2 87 04              1385        J      NF
    171B 3C F1 1720            1386 ITSON  MVI    NF+1,X'F1'               MOVE IN A 1.
    171F 3C 00 0000            1387 NF     MVI    *-*,X'00'                PUT 1/0 IN OUTPUT.
                               1388
    1723 38 00 16EC            1389 TNFF   TBN    EB1T,X'00'               THIS BIT ON IN EB1 ?
    1727 F2 10 07              1390        JT     ITCN                     JUMP IF SO.
    172A 3C F0 1736            1391        MVI    NFF+1,X'F0'              MOVE IN A 0.
    172E F2 87 04              1392        J      NFF
    1731 3C F1 1736            1393 ITON   MVI    NFF+1,X'F1'              MOVE IN A 1.
    1735 3C 00 0000            1394 NFF    MVI    *-*,X'00'                PUT 1/0 IN OUTPUT.
                               1395
    1739 38 80 170E            1396        TBN    TNF+1,X'80'              CHECKED BIT 0 ?
    173D C0 10 0000            1397 BTNF   BT     *-*                      RETURN IF SO.
    1741 0E 00 170E 170E       1398        ALC    TNF+1(1),TNF+1           INCREMENT BIT POINTER.
    1747 0E 00 1724 1724       1399        ALC    TNFF+1(1),TNFF+1
    174D 0F 01 1722 18D2       1400        SLC    NF+3(2),N002             DECREMENT OUTPUT ADRS.
    1753 0F 01 1738 18D2       1401        SLC    NFF+3(2),N002
    1759 C0 87 170C            1402        B      TNF                      CONTINUE CHECK.
                               1403
                               1404 ***************************************************************
                               1405 * QUES *                                                      *
                               1406 ********            SUBROUTINE DETERMINES IF SSW 10 IS ON.  *
                               1407 *                                                           *
                               1408 ***************************************************************
    175D 34 08 1771            1409 QUES   ST     QS+3,ARR                 STORE RETURN ADDRESS.
    1761 38 80 020A            1410        TBN    SBYTE2,SSW10             SSW 10 ON ?
    1765 F2 10 0A              1411        JT     QST                      RETURN TO PRGM HALT IF SO.
    1768 0E 01 1771 18D4       1412        ALC    QS+3(2),N003             INCR RETURN TO SKIP HALT.
    176E C0 87 0000            1413 QS     B      *-*                      RETURN TO ROUTINE.
                               1414
    1772 3D C2 0200            1415 QST    CLI    X'C200',X'C2'            IS THIS A MODEL 'B' SYSTEM ?
    1776 C0 01 176E            1416        BNE    QS                       GO DO NORMAL HALT IF NOT.
    177A 35 01 1771            1417        L      QS+3,XR1
    177E 4C 01 02 18F0         1418        MVC    2(2,XR1),HFFF8           SET UP MODEL B HALT.
    1783 C0 87 176E            1419        B      QS                       NOW GO HALT.
                               1420
                               1421 ***************************************************************
                               1422 * TIOERX *                                                    *
                               1423 **********          SUBROUTINE PRINTS TIO ERROR MESSAGES.   *
                               1424 *                                                           *
                               1425 ***************************************************************
    1787 C0 87 021A            1426 TIOERD B      PRINT                    PRINT 3741 IS READY ERROR MESSAGE.
    178B C2               178B 1427        DC     XL1'C2'
    178C 0E               178C 1428        DC     IL1'14'
    178D 1CAE             178E 1429        DC     AL2(RDY)
    178F 4001             1790 1430        DC     XL2'4001'
    1791 0C 28 1F17 1E9B       1431        MVC    PRT-50(41),CNCTR
    1797 C0 87 189C            1432        B      EPRNT1                   PRINT IS CONNECTOR ON ?
    179B 0C 24 1F1C 1EC0       1433        MVC    PRT-45(37),RMOV
    17A1 C0 87 18A7            1434        B      EPRNT2                   PRINT OPERATOR TO REMOVE IT IF SO.
    17A5 0C 18 1FC7 1ED9       1435        MVC    PRT-66(25),IFOFF
    17AB C0 87 189C            1436        B      EPRNT1                   PRINT OTHERWISE.
                               1437
    17AF C0 87 17D9            1438        B      MAPS                     POINT TO MAP CHART.
    17B3 8702             17B4 1439        DC     XL2'8702'                -PAGE 870, ENTRY 2.
    17B5 C0 87 0222            1440        B      HALT                     ERROR HALT -01-.
    17B9 4001             17BA 1441        DC     XL2'4001'
```


4011 3741 FUNCTION TEST WITHOUT THE WRAP CCNNECTOR

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    17BB C0 87 0A11            1442        B      BEGINN                   TELL TO DO SYSTEM RESET, START.
                               1443
    17BF C0 87 021A            1444 TIOERB B      PRINT                    PRINT 3741 IS BUSY ERROR MESSAGE.
    17C3 C2               17C3 1445        DC     XL1'C2'
    17C4 0D               17C4 1446        DC     IL1'13'
    17C5 1CA0             17C6 1447        DC     AL2(BUSSY)
    17C7 4002             17C8 1448        DC     XL2'4002'
    17C9 C0 87 17D9            1449        B      MAPS                     POINT TO MAP CHART.
    17CD 8721             17CE 1450        DC     XL2'8721'                -PAGE 872, ENTRY 1.
    17CF C0 87 0222            1451        B      HALT                     ERROR HALT -02-.
    17D3 4002             17D4 1452        DC     XL2'4002'
    17D5 C0 87 0216            1453        B      LINK                     RETURN TO DCP.
                               1454
                               1455 *******************************************************************
                               1456 * MAPS *                                                          *
                               1457 ********            THE MAP CHART REFERENCE IS PRINTED. CALL     *
                               1458 *                   SUBROUTINE BY -                               *
                               1459 *                                                                 *
                               1460 *                   B      MAPS                                   *
                               1461 *                   DC     XL2'PAGE NUMBER/ENTRY NUMBER'          *
                               1462 *                                                                 *
                               1463 *******************************************************************
    17D9 34 08 18FE            1464 MAPS   ST     TEMP,ARR                 STORE THE ARR.
    17DD 35 01 18FE            1465        L      TEMP,XR1                 LOAD ARR INTO XR1.
    17E1 18 02 1C48 00         1466        MNZ    MAPSS-11,0(,XR1)         STORE HUNDREDS DIGIT.
    17E6 18 03 1C49 00         1467        MNN    MAPSS-10,0(,XR1)         STORE TENS DIGIT.
    17EB 18 02 1C4A 01         1468        MNZ    MAPSS-9,1(,XR1)          STORE UNITS DIGIT.
    17F0 18 03 1C52 01         1469        MNN    MAPSS-1,1(,XR1)          STORE ENTRY NUMBER.
                               1470
    17F5 C0 87 021A            1471        B      PRINT                    PRINT- GO TO MAP CHART XX.
    17F9 86               17F9 1472        DC     XL1'86'
    17FA 22               17FA 1473        DC     IL1'34'
    17FB 1C53             17FC 1474        DC     AL2(MAPSS)
                               1475
    17FE C0 87 02              1476        B      2(,XR1)                  RETURN TO ROUTINE.
                               1477
                               1478 *******************************************************************
                               1479 * CODE *                                                          *
                               1480 ********            TEST HEADINGS ARE PRINTED FOR RTN07-0E.      *
                               1481 *                                                                 *
                               1482 *******************************************************************
    1800 34 08 1809            1483 CODE   ST     COD+5,ARR
    1804 0C 00 1CE5 0000       1484 COD    MVC    THC-1(1),*-*             STORE N CODE ID.
    180A 36 08 18D0            1485        A      N001,ARR
    180E 34 08 189B            1486        ST     CODD+3,ARR               STORE RETURN ADDRESS.
                               1487
    1812 3C F1 1CE5            1488        CLI    THC-1,X'F1'              N CODE 1?
    1816 C0 01 1824            1489        BNE    *+14                     BRANCH IF NOT.
    181A 0C 10 1F27 198C       1490        MVC    PRT-34(17),FNCT          LOAD N CODE 1 MEANING.
    1820 3C 4B 1F28            1491        MVI    PRT-33,X'4B'
    1824 3D F2 1CE5            1492        CLI    THC-1,X'F2'              N CODE 2?
    1828 C0 01 1836            1493        BNE    *+14                     BRANCH IF NOT.
    182C 0C 14 1F2B 1AC4       1494        MVC    PRT-30(21),STLCR         BRING IN N CODE 2 MEANING.
    1832 3C 4B 1F2C            1495        MVI    PRT-29,X'4B'
    1836 3D F3 1CE5            1496        CLI    THC-1,X'F3'              N CODE 3?
    183A C0 01 1848            1497        BNE    *+14                     BRANCH IF NOT.
    183E 0C 11 1F28 1AD6       1498        MVC    PRT-33(18),IOTRL         BRING IN N CODE 3 MEANING.
    1844 3C 4B 1F29            1499        MVI    PRT-32,X'4B'
    1848 3D F5 1CE5            1500        CLI    THC-1,X'F5'              N CODE 5?
    184C C0 01 185A            1501        BNE    *+14                     BRANCH IF NOT.
    1850 0C 15 1F2C 1811       1502        MVC    PRT-29(22),DIGTR         BRING IN N CODE 5 MEANING.
    1856 3C 4B 1F2D            1503        MVI    PRT-28,X'4B'
                               1504
    185A C0 87 021E            1505        B      UNPACK                   UNPACK CURRENT TEST PATTERN.
    185E 02               185E 1506        DC     IL1'2'
    185F 1919             1860 1507        DC     AL2(PATRN)
    1861 1D9E             1862 1508        DC     AL2(TSPAT-6)
    1863 0C 27 1F16 1DA4       1509        MVC    PRT-51(40),TSPAT         BRING REST OF HEADING.
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    1869 0D 01 1D9C 18F8       1510        CLC   TSPAT-2(2),C00         LCR OR DTR TEST ?
    186F F2 01 12              1511        JNE   GOHD                   JUMP IF NOT.
    1872 0C 01 1DA8 1D9E       1512        MVC   SHCRT-2(2),TSPAT-6     MOVE IN SPECIAL PATTERN.
    1878 0C 05 1F11 1DAA       1513        MVC   PRT-56(6),SHORT
                               1514
    187E 08 03 188D 0A03       1515        MNN   HDNGID,RTN#            MOVE IN ROUTINE ID HEADING.
    1884 C0 87 021A            1516 GOHD   B     PRINT                  PRINT HEADINGS FOR RTN 05 - 0C.
    1888 45               1888 1517        DC    XL1'45'
    1889 5B               1889 1518        DC    IL1'91'
    188A 1F49             188B 1519        DC    AL2(PRT)
    188C 40A0             188D 1520 HDNGID DC    XL2'40A0'
    188E 0C 5A 1F49 1F4A       1521        MVC   PRT(91),PRT+1          CLEAR PRINT AREA.
    1894 C1 42 17BF            1522        TIO   DRCPD,X'42'            BRANCH IF 3741 IS BUSY.
    1898 C0 87 0000            1523 CODD   B     *-*                    RETURN TO MAIN ROUTINE.
                               1524
                               1525 ******************************************************************
                               1526 * EPRNTX *                                                       *
                               1527 **********           DCP ERRCR PRINTING SUBPOUTINES.            *
                               1528 *                                                              *
                               1529 ******************************************************************
    189C 34 08 18C0            1530 EPRNT1 ST    PRTT+3,ARR             STORE RETURN ADDRESS.
    18A0 3C 81 18B3            1531        MVI   LINE,X'81'             SET TO SPACE 1 LINE.
    18A4 F2 87 C8              1532        J     PRNT                   GO PRINT.
    18A7 34 08 18C0            1533 EPRNT2 ST    FRTT+3,ARR             STORE RETURN ADDRESS.
    18AB 3C 82 1883            1534        MVI   LINE,X'82'             SET TO SPACE 2 LINES.
                               1535
    18AF C0 87 021A            1536 PRNT   B     PRINT                  PRINT THE DATA STORED IN -PRT-.
    18B3 00               1883 1537 LINE   DC    XL1'00'                DO CORRESPONDING SPACE OPERATION.
    18B4 5B               18B4 1538        DC    IL1'91'
    18B5 1F49             1886 1539        DC    AL2(PRT)
    18B7 0C 5A 1F49 1F4A       1540        MVC   PRT(91),PRT+1          CLEAR PRINT AREA.
    18BD C0 87 0000            1541 PRTT   B     *-*                    RETURN TO ROUTINE.
                               1542
                               1543 ******************************************************************
                               1544 * INT4 *                                                         *
                               1545 ********          BRANCH HERE IF INTERRUPT IS ERRONEOUSLY        *
                               1546 *                 CAUSED IN ROUTINE OF.                          *
                               1547 *                                                                *
                               1548 ******************************************************************
    18C1 00               18C1 1549 FLAG   DC    XL1'00'
    18C2 3A 01 18C1            1550 INT5   SBN   FLAG,X'01'             TURN ON ERROR FLAG.
    18C6 F3 40 0D              1551        SIO   X'0D',X'40'            RESET THE INTERRUPT.
    18C9 C0 87 18C2            1552        B     INT5
                               1553
                               1554 *******************
                               1555 *    CONSTANTS    *
                               1556 ******************************************************************
    18CD 0000             18CE 1557 N000   DC    IL2'0'
    18CF 0001             18D0 1558 N001   DC    IL2'1'
    18D1 0002             18D2 1559 N002   DC    IL2'2'
    18D3 0003             18D4 1560 N003   DC    IL2'3'
    18D5 0004             18D6 1561 N004   DC    IL2'4'
    18D7 0012             18D8 1562 N018   DC    IL2'18'
    18D9 0013             18DA 1563 N019   DC    IL2'19'
    18DB 001D             18DC 1564 N029   DC    IL2'29'
    18DD 0080             18DE 1565 H0080  DC    XL2'0080'
    18DF AA55             18E0 1566 HAA55  DC    XL2'AA55'
    18E1 55AA             18E2 1567 H55AA  DC    XL2'55AA'
    18E3 1000             18E4 1568 H1000  DC    XL2'1000'
    18E5 0055             18E6 1569 H0055  DC    XL2'0055'
    18E7 0F55             18E8 1570 H0F55  DC    XL2'0F55'
    18E9 00AA             18EA 1571 H00AA  DC    XL2'00AA'
    18EB AAAA             18EC 1572 HAAAA  DC    XL2'AAAA'
    18ED FFFF             18EE 1573 HFFFF  DC    XL2'FFFF'
    18EF FFF8             18F0 1574 HFFF8  DC    XL2'FFF8'
    18F1 FF55             18F2 1575 HFF55  DC    XL2'FF55'
    18F3 C0E7             18F4 1576        DC    XL2'C087'
    18F5 1257             18F6 1577 BRNCH  DC    AL2(RTRN)
```



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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    18F7 F0F0             18F8 1578 C00    DC    CL2'00'
    18F9 18C2             18FA 1579 INTR5  DC    AL2(INT5)              INTERRUPT ROUTINE ADDRESS.
                               1580
                               1581 *******************
                               1582 *  RESERVED AREAS *
                               1583 ******************************************************************
    18FB 0000             18FC 1584 DTR    DC    XL2'0000'              STORAGE AREA FOR DATA TRANSFER REG.
    18FD 0000             18FE 1585 TEMP   DC    XL2'00'                1-2 WORD WORKING AREA.
    18FF 0000000000000000 190D 1586 WORK   DC    15XL1'00'              WORK AREA.
    1907 00000000000000        1586
    190E 0000000000000000 1915 1587 LS     DC    8XL1'00'               LIO/SNS STORAGE AREA.
    1916 0000             1917 1588 LSCK   DC    XL2'0000'              ACTUAL SENSED DATA STORAGE AREA.
    1918 0000             1919 1589 PATRN  DC    XL2'0000'              CURRENT TEST PATTERN STORAGE AREA.
    191A 00               191A 1590        DC    XL1'00'                CURRENT ERROR ID.
    191B 00               191B 1591 NID    DC    XL1'00'                CURRENT N CODE.
    191C 00               191C 1592 XPCT   DC    XL1'00'                EXPECTED DIAGNOSTIC BYTE.
                               1593
                               1594 ********
                               1595 * FLAG *
                               1596 ******************************************************************
    191D 00               191D 1597 EBFLAG DC    XL1'00'                EB CYCLE FAILURE FLAG.       *
                               1598 *      BIT #       N CCDE     EB BYTE #                         *
                               1599 *        0           1           2              AN ACTIVE BIT MEANS *
                               1600 *        1           1           1              A POSSIBLE EB CYCLE *
                               1601 *        2           2           2              FAILURE.            *
                               1602 *        3           2           1                                  *
                               1603 *        4           4           2                                  *
                               1604 *        5           4           1                                  *
                               1605 *        6           5           2                                  *
                               1606 *        7           5           1                                  *
                               1607 ******************************************************************
                               1608
                               1609
                               1610 *******************
                               1611 *    MESSAGES     *
                               1612 ******************************************************************
    191E D9C5D4D6E5C540E6 194E 1613 RSIOC  DC    CL49'REMOVE WRAP CONNECTOR  NOTE - CPU MAY DROP POWER.'
    1926 D9C1D740C3D6D5D5      1613
    192E C5C3E3D6D94040C5      1613
    1936 D6E3C540C4C0C3D7      1613
    193E E440D4C1E840C4D9      1613
    1946 D6D740D7D6E6C5D9      1613
    194E 4B                    1613
    194F C9C640E2D66B40E3 1978 1614 IFSO   DC    CL45'IF SO, TURN POWER BACK ON AND RELOAD PROGRAM.'
    1957 E4D9D540D7D6E6C5      1614
    195F D940C2C1C3D240D6      1614
    1967 D540C1D5C440D9C5      1614
    196F D3D6C1C44CD7D9D6      1614
    1977 C7D9C1D44B            1614
    197C C6E4D5C3E3C9D6D5 198C 1615 FNCT   DC    CL17'FUNCTION REGISTER'
    1984 40D9C5C7C9E2E3C5      1615
    198C D9                    1615
                          198C 1616 MSG1B  EQU   *-1
    198D D9C5D4D6E5C540F3 19B3 1617        DC    CL39'REMOVE 3741 I/O CABLE.  ALSO REMOVE THE'
    1995 F7F4F140C961D640      1617
    199D C3C1C2D3C54B4040      1617
    19A5 C1D3E2D640D9C5D4      1617
    19AD D6E5C540E3C8C5        1617
    19B4 40E6D9C1D740C3D6 19DB 1618        DC    CL40' WRAP CONNECTOR, THEN PERFORM A SYSTEM  '
    19BC D5D5C5C3E3D6D94B      1618
    19C4 40E3C8C5D5404007C5    1618
    19CC D9C6D6D9D440C14C      1618
    19D4 E2E8E2E3C5D44040      1618
    19DC 4040404040404040 1A03 1619 MSG1   DC    CL40'                                        '
    19E4 4040404040404040      1619
    19EC 4040404040404040      1619
    19F4 4040404040404040      1619
    19FC 4040404040404040      1619
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4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                          1A03 1620 MSG2B  EQU   *-1
   1A04 D9C5E2C5E340C1D5  1A2B 1621         DC    CL40'RESET AND START.          .
   1A0C C440E2E3C1D5E348       1621
   1A14 4040404040404040       1621
   1A1C 4040404040404040       1621
   1A24 404040404040404C       1621
   1A2C 4040404040404040  1A53 1622 MSG2   DC    CL40'                          .
   1A34 4040404040404040       1622
   1A3C 4040404040404040       1622
   1A44 4040404040404040       1622
   1A4C 4C404C4C40404C40       1622
                               1623
                          1A53 1624 MSG4B  EQU   *-1
   1A54 C4C1E3C140C1C4C4  1A7B 1625         DC    CL40'DATA ADDRESS REGISTER FAILURE.  .
   1A5C D9C5E2E240D9C5C7       1625
   1A64 C9E2E3C5D540C6C1       1625
   1A6C C5D3E4D9C54B4040       1625
   1A74 4040404040404040       1625
   1A7C 404C404C40404040  1AA3 1626 MSG4   DC    CL40'                          .
   1A84 404C4C4040404040       1626
   1A8C 4040404040404040       1626
   1A94 4040404040404040       1626
   1A9C 4040404040404040       1626
                               1627
   1AA4 E2E3C1E3E4E240C2  1AC4 1628 STLCR  DC    CL33'STATUS BYTE-LENGTH COUNT REGISTER'
   1AAC E6E3C560D3C5D5C7       1628
   1AB4 E3C840C3D6E4D5E3       1628
   1ABC 40D5C5C7C9E2E3C5       1628
   1AC4 D9                     1628
   1AC5 C961D640E3D9C1D5  1AD6 1629 IOTRL  DC    CL18'I/O TRANSFER LINES'
   1ACD E2C6C5D94CD3C9D5       1629
   1AD5 C5E2                   1629
   1AD7 C4C1E3C140C1C4C4  1AEB 1630 DADR   DC    CL21'DATA ADDRESS REGISTER'
   1ADF D9C5E2E240D5C5C7       1630
   1AE7 C9E2E3C5D9             1630
   1AEC C4C9C1C7D5D6E2E3  1B11 1631 DIGTR  DC    CL38'DIAGNOSTIC BYTE-DATA TRANSFER REGISTER'
   1AF4 C9C340C2E6E3C560       1631
   1AFC C4C1E3C140E3D9C1       1631
   1B04 D5E2C6C5D540D9C5       1631
   1B0C C7C5E2E3C5D9           1631
   1B12 C5C240C3E8C3D3C5  1B29 1632 BIGGEB DC    CL24'EB CYCLE ANALYSIS CHECK.'
   1B1A 40C1D5C1D3E6E2C9       1632
   1B22 E240C3C8C5C3D24B       1632
   1B2A 5C5CC5C2E740C3E8  1B46 1633 EBX    DC    CL29'**EBX CYCLE FAILED. N CODE X.'
   1B32 C3D3C540C6C1C9D3       1633
   1B3A C5C44B40D540C3D6       1633
   1B42 C4C540E74B             1633
   1B47 5C5CC2D6E3C840C5  1B68 1634 EB12   DC    CL34'**BOTH EB CYCLES FAILED. N CODE X.'
   1B4F C240C3E8C3D3C5E2       1634
   1B57 40CCC1C9D3C5C44B       1634
   1B5F 40D540C3D6C4C540       1634
   1B67 E74B                   1634
   1B69 5C5CC1D3D340C5C2  1B7F 1635 ALEB   DC    CL23'**ALL EB CYCLES FAILED.'
   1B71 40C3E8C3D3C5E240       1635
   1B79 C6C1C9D3C5C44B         1635
   1B80 5C5CC1D3D340C5C2  1B97 1636 ALEBX  DC    CL24'**ALL EBX CYCLES FAILED.'
   1B88 E740C3E8C3D3C5E2       1636
   1B90 40C6C1C9D3C5C44B       1636
   1B98 E3C5E2E340C4C1E3  1BBB 1637 TSCYC  DC    CL36'TEST DATA TRANSFER DURING EB CYCLES.'
   1BA0 C140E3D9C1D5E2C6       1637
   1BA8 C5D940C4E4D9C9D5       1637
   1BB0 C740C5C240C3E8C3       1637
   1BB8 D3C5E24B               1637
   1BBC C4C9C1C7D5D6E2E3  1BCA 1638 DIAG   DC    CL15'DIAGNOSTIC BYTE'
   1BC4 C9C340C2E6E3C5         1638
   1BCB D3C9D661E2D5E240  1BE0 1639 LSCKK  DC    CL22'LIC/SNS COMPARE CHECK.'
   1BD3 C3D6D4D7C1D9C540       1639
   1BDB C3C8C5C3D24B           1639
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4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   1BE1 D3C9D640C6C1C9D3  1C0B 1640 LIORST DC    CL43'LIO FAILED TO RESET LENGTH COUNT REGISTER.'
   1BE9 C6C440E3D640D9C5       1640
   1BF1 E2C5E340D3C5D5C7       1640
   1BF9 E3C640C3D6E4D5E3       1640
   1C01 40D9C5C7C9E2E3C5       1640
   1C09 D54B49                 1640
   1C0C C4C9C1C7D5D6E2E3  1C21 1641 SIOCK  DC    CL22'DIAGNOSTIC BYTE CHECK.'
   1C14 C9C340C2E8E3C540       1641
   1C1C C3C6C5C3D24B           1641
   1C22 E3C5E2E340C1C2C9  1C31 1642 TSID   DC    CL16'TEST ABILITY TO'
   1C2A D3C9E3E840E3D640       1642
   1C32 C7D640E3D640F3F7  1C53 1643 MAPSS  DC    CL34'GO TO 3741 MAPS. PAGE 000 ENTRY 0.'
   1C3A F4F140D4C1D7E26B       1643
   1C42 40D7C1C7C540F0F0       1643
   1C4A F040C5D5E3D9E46C       1643
   1C52 F04B                   1643
   1C54 D3D6C1C461E2C5D5  1C7D 1644 VNOD   DC    CL42'LOAD/SENSE DATA ADDRESS REGISTER WITH'
   1C5C E2C540C4C1E3C140       1644
   1C64 C1C4C4D9C5E2E240       1644
   1C6C D9C5C7C9E2E3C5D9       1644
   1C74 40F6C5E3C8404040       1644
   1C7C 4040                   1644
   1C7E 40C2C9E340D7C1E3  1C8B 1645 LSDAR  DC    CL14' BIT PATTERNS.'
   1C86 E3C5D9D5E24B           1645
   1C8C C5E5C5D5          1C8F 1646 EVEN   DC    CL4'EVEN'
   1C90 D6C4C440          1C93 1647 ODD    DC    CL4'ODD'
   1C94 F3F7F4F140C9E240  1CA0 1648 BUSSY  DC    CL13'3741 IS BUSY.'
   1C9C C2E4E2E84B             1648
   1CA1 F3F7F4F140C9E240  1CAE 1649 RDY    DC    CL14'3741 IS READY.'
   1CA9 D9C5C1C4E84B           1649
   1CAF E3C5E2E340F3F7F4  1CC5 1650 TOBSY  DC    CL23'TEST 3741 FOR NOT BUSY.'
   1CE7 F140C6D6D940D5D6       1650
   1CBF E340C2E4E2E84B         1650
   1CC6 E3C5E2E340F3F7F4  1CDD 1651 TORDY  DC    CL24'TEST 3741 FOR NOT READY.'
   1CCE F140C6D6D940D5D6       1651
   1CD6 E340D9C5C1C4E84B       1651
   1CDE D540C3D6C4C540E7  1CE6 1652 THD    DC    CL5'N CODE X.'
   1CE6 4B                     1652
   1CE7 F040F140F240F340  1CF5 1653 BITS   DC    CL15'0 1 2 3 4 5 6 7'
   1CEF F440F540F640F7         1653
   1CF6 60C5C2F140C2E8E3  1CFF 1654 EB1    DC    CL10'-EB1 BYTE-'
   1CFE C5E60                  1654
   1D00 60C5C2F240C2E8E3  1D09 1655 EB2    DC    CL10'-EB2 BYTE-'
   1D08 C5E60                  1655
   1D0A 5CC5D9D9D6D9C5C   1D10 1656 ERORS  DC    CL7'*ERROR*'
   1D11 D9C5C1C461E6D9C9  1D2B 1657 NTRST  DC    CL27'READ/WRITE LATCH NOT RESET.'
   1D19 E3C540D3C1E3C3C8       1657
   1D21 40D5D6E340D9C5E2       1657
   1D29 C5E34B                 1657
   1D2C C9D5E3C5D9D9E4D7  1D4B 1658 INTR   DC    CL29'INTERRUPT ENABLE RESET CHECK.'
   1D34 E340C5D5C1C2D3C5       1658
   1D3C 40D5C5E2C5E34CC3       1658
   1D44 C8C5C3D24B             1658
   1D49 D5D660D6D740D3C1  1D61 1659 NOSEE  DC    CL25'NO-OP LATCH FAILS TO SET.'
   1D51 E3C3C840C6C1C9D3       1659
   1D59 E240E3D640E2C5E3       1659
   1D61 4B                     1659
   1D62 D5D660D6D740D3C1  1D7C 1660 NORES  DC    CL27'NO-OP LATCH FAILS TO RESET.'
   1D6A E3C3C840C6C1C9D3       1660
   1D72 E240E3D640D9C5E2       1660
   1D7A C5E34B                 1660
   1D7D D3D6C1C461E2C5D5  1DA4 1661 TSPAT  DC    CL40'LOAD/SENSE WITH TEST PATTERN -XXXX- THE'
   1D85 E2C540E6C5E3C840       1661
   1D8D E3C5E2E340D7C1E3       1661
   1D95 E3C5D9D54060E7E7       1661
   1D9D E7E76040E3C8C540       1661
   1DA5 4C60E7E7604C      1DAA 1662 SHORT  DC    CL6' -XX- '
   1DAB E3C5E2E340C1C2C9  1DDD 1663 INVAL  DC    CL51'TEST ABILITY OF 3741 TO REJECT 15 INVALID COMMANDS.'
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4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    1DE3 D3C5E3E840D6C640      1663
    1DEB F3F7F4F140E3D4C       1663
    1DF3 D9C5D1C5C3E340F1      1663
    1DFB F540C9D5E5C1D3C9      1663
    1E03 C440C3D6D4D4C1D5      1663
    1E0B C4E24B                1663
    1E0E C4C640E2E8E2E3C5 1E01 1664 INVL   DC    CL36'DO SYSTEM RESET AND START, 16 TIMES.'
    1E16 D440D9C5E2C5E340      1664
    1E1E C1D5C440E2E3C1D9      1664
    1E26 E36B40F1F640E3C5      1664
    1E2E D4C5E24B              1664
    1E32 C5E7D7C5C3E340D7 1E32 1665        DC    CL49'EXPECT PROCESS CHECK AFTER EACH SYSTEM RESET AND '
    1E3A D5D6C3C5E2E24CC3      1665
    1E42 C6C5C3C240C1C6E3      1665
    1E4A C5D540C5C1C3C840      1665
    1E52 E2E8E2E3C5D440D5      1665
    1E5A C5E2C5E340C1D5C4      1665
    1E62 40                    1665
    1E63 E2E3C1D9E34B     1E38 1666 IVL    DC    CL6'START.'
    1E69 C6D5E5C1D3C9C440 1E5C 1667 FLWNG  DC    CL36'INVALID COMMAND WAS ACCEPTED.  XXX N'
    1E71 C3D6D4D4C1D5C440      1667
    1E79 E6C1E240C1C3C3C5      1667
    1E81 D7E3C5C44B4040E7      1667
    1E89 E7E740D5              1667
    1E8D E2C5D5E2C5E40E3C8 1E66 1668 SNTHE  DC    CL10'SENSE THE '
    1E95 C5E40                 1668
    1E97 E2C5D5E2C5E40C3C8 1E72 1669 SNCKMS DC    CL12'SENSE CHECK.'
    1E9F C5C3D24B              1669
    1EA3 5C5CD5D6E3C55C5C 1E9B 1670 CNCTR  DC    CL41'**NOTE** IF A WRAP CONNECTOR IS ATTACHED.'
    1EAB 40C9C640C140E6D9      1670
    1EB3 C1D740C3D6D6D5C5      1670
    1EB8 C3E3D6D540C9E240      1670
    1EC3 C1E3E3C1C3C6C5C4      1670
    1EC9 6B                    1670
    1ECA D9C5D4D6E5C540C9 1EC0 1671 RMOV   DC    CL37'REMOVE IT AND DO SYSTEM RESET, START.'
    1ED2 E340C1D5C440C4D6      1671
    1EDA 4CE2E8E2E3C5D440      1671
    1EE2 D9C5E2C5E36B40E2      1671
    1EEA E3C1D9E34B            1671
    1EEC C5C640C3D6D6D5C5 1ED9 1672 IFOFF  DC    CL25'IF CONNECTOR IS OFF THEN.'
    1EF4 C3E3D6D540C9E240      1672
    1EFC D6C6C640E3C8C5D5      1672
    1F04 6B                    1672
    1F05 F3F7F4F140C9D5E3 1EEE 1673 SIOC4  DC    CL21'3741 INTERRUPT CHECK.'
    1F0D C5D9D9E4D7E340C3      1673
    1F15 C6C5C3D24B            1673
    1F1A                  1F49 1674 PPT    DS    CL51                PRINT FIELD.
    1F4B 40               1F4A 1675        DC    XL1'40'             CLEARING BYTE.
                               1676
                               1677 **********
                               1678 *    EQUATES    *
                               1679 ********************************************************************************
                          0008 1680 ARR    EQU   X'C8'
                          0222 1681 HALT   EQU   X'222'
                          0216 1682 LINK   EQU   X'216'
                          022A 1683 LOAD   EQU   X'22A'
                          021A 1684 PRINT  EQU   X'21A'
                          021E 1685 UNPACK EQU   X'21E'
                          0001 1686 XR1    EQU   X'01'
                          0002 1687 XR2    EQU   X'02'
                          0084 1688 IAR5   EQU   X'E4'
                          0A03 1689 RTN#   EQU   X'0A03'
                          0080 1690 SSW10  EQU   X'80'
                          0080 1691 SSW00  EQU   X'80'
                          0208 1692 SBYTE0 EQU   X'0208'
                          020A 1693 SBYTE2 EQU   X'C20A'
                          0A07 1694 FRTN   EQU   X'CA07'
                          18CE 1695 M0000  EQU   N0C0
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4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         18D0 1696 M0001  EQU   N0C1
                         17BF 1697 DROPD  EQU   TICERD
                         1EC0 1698 INTRD  EQU   RMOV
                         0A11 1699        END   BEGINN
```

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ACT	A	002	163E	1215	1124* 1169 1234* 1297* 1329 1333 1338 1342
ADDIT	A	006	156C	1239	
ALEB	A	023	187F	1635	0330
ALEBX	A	024	1857	1636	0324* 0326* 0327
ALTER	A	004	0A43	0047	0044
ARR	C	001	0008	1680	1089* 1090 1119* 1120 1122* 1123 1125* 1126 1128* 1129 1182* 1183
					1185* 1186 1248 1250* 1251 1253* 1254 1267 1269* 1270 1317 1371*
					1372 1375* 1376 1409 1464 1483 1485* 1486 1530 1533
BADINT	A	004	0FA7	0712	0700
BEGIN	A	001	0ACD	0024	0017
BEGINN	A	001	0A11	0028	0052 1442 1696
BIGEB	A	004	0D19	0367	0328 0331 0339
BIGEEB	A	024	1B29	1632	0370
BITS	A	015	1CF5	1653	1162 1165 1218 1219 1226 1286
BITSNF	A	004	16E1	1371	1168 1230 1291
BRNCH	A	002	18FE	1577	0684
BTNF	A	004	173D	1397	1376*
BUSSY	A	013	1CA0	1648	1447
CALC	A	004	1548	1230	1223
CKBYT	A	004	0BF2	0281	0277* 0285* 0287
CKKLS	A	004	14A7	1190	1186* 1239* 1240
CKPST	A	004	10EA	0841	0801 0943
CKRSTT	A	003	10E3	0838	0830
CKS	A	004	1637	1304	1270* 1273 1303*
CKSID	A	004	15B0	1267	0702 0786 0828
CMPARE	A	004	163F	1317	1171 1235 1298
CMPR	A	004	1657	1346	1317*
CNCTR	A	041	1E9B	1670	1431
COD	A	006	1804	1484	1483*
CODE	A	004	1898	1523	1486*
CODE	A	004	1800	1483	0392 0425 0458 0493 0619 0654
COO	A	002	18F8	1578	1510
DADR	A	021	1AEB	1630	1206
DARCK	A	004	0EB0	0563	0556
DIAG	A	015	1BCA	1638	0213 1146 1282
DIGTR	A	038	1B11	1631	1209 1502
DORST	A	003	107F	0799	0791
DROPD	A	004	17BF	1657	0129 0132 0261 0690 0736 0778 0818 0876 0905 0925 1522
DTR	A	002	18FC	1564	0698* 0744* 0746 0786* 0825* 1272 1292 1297
DUG	A	002	0B57	0233	0225* 0226 0226
EEERR	A	006	0C94	0330	0292
EBFLAG	A	001	191D	1597	0278* 0283* 0291 0293 0295 0298 0300 0302 0305 0307 0309 0311
					0313 0315 0317 0342 0349 0356
EEX	A	029	1B46	1633	0341* 0344* 0346* 0348* 0351* 0353* 0355* 0358* 0360* 0363* 0364* 0365
EBXX	A	006	0D13	0365	0347 0354 0361
EE1	A	010	1CFF	1654	1159 1216 1224
EE1ERR	A	004	0C7E	0324	0294
EE1T	A	001	16E0	1369	1374* 1389
EE12	A	034	1B68	1634	0333* 0335* 0337* 0338
EE2	A	010	1D09	1655	1156 1215 1284
EE2ERR	A	004	0CB6	0326	0296
EE2T	A	001	16DF	1368	1382
EPRNT1	A	004	189C	1530	1160 1170 1217 1225 1232 1285 1294 1432 1436
EPRNT2	A	004	18A7	1533	0372 1147 1166 1173 1210 1220 1227 1237 1283 1287 1301 1434
ERORS	A	007	1D10	1656	1172 1236 1295
ERSN	A	004	1484	1174	1129*
ERST	A	004	10FE	0851	0842
ERRA	A	004	0F28	0520	0503
ER14	A	004	137B	1C89	1008 1013 1018 1024 1029 1034 1039 1045 1050 1055 1060 1065
					1071 1076 1081
EVEN	A	004	1C8F	1646	0543
E13	A	004	1208	0955	0934
E13A	A	004	11ED	0947	0938
FINEB	A	006	0CB0	0338	0334 0336
FLAG	A	001	18C1	1545	0652* 0699 1550*
FLWNG	A	036	1E5C	1667	1091* 1092 1093

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
FNCT	A	017	198C	1615	1200 1469
FRTN	C	001	0AC7	1694	0042*
GCMD	A	004	1884	1516	1511
HAAAA	A	002	18EC	1572	
HAAES	A	002	18E0	1566	0391 0558 0560
HALT	C	001	0222	1681	0049 0151 0193 0230 0375 0408 0441 0476 0514 0527 0571 0637
					0672 0708 0719 0759 0795 0834 0852 0954 0966 1000 1103 1440
					1451
HDNGID	A	002	188D	1520	1515*
HFFFF	A	002	18EE	1573	0502
HFFF8	A	002	18F0	1574	1418
HFF85	A	002	18F2	1575	0266 0267 0268 0269
HFLXX	A	002	0A4C	0050	0043 0045* 0047*
HOF55	A	002	18E8	1570	0133
H00AA	A	002	18EA	1571	0492 0653
H0000	A	002	18CE	1555	0128 0130 0904 0930 1023 1028 1033 1038
H0001	A	002	18D0	1556	0602
H0055	A	002	18EE	1569	0457 0618
H0080	A	002	18DE	1565	0696 0741 0782 0823 0881
H1000	A	002	18E4	1568	0599
H55AA	A	002	18E2	1567	0424 0553 0568
IARS	C	001	0064	1688	0691*
IFOFF	A	025	1ED9	1672	1436
IFSC	A	045	197B	1614	
INTR	A	029	1D48	1658	0784
INTRO	A	037	1ECC	1698	
INTR5	A	002	18FA	1579	0691
INTS	A	004	18C2	1550	1552 1579
INVAL	A	051	1DDD	1663	0689
INVL	A	036	1E01	1664	0994
IOTPL	A	018	1ADC	1625	0166 1143 1498
ITON	A	004	1731	1393	1390
ITSON	A	004	1718	1386	1382
IVL	A	006	1E38	1666	0998
LCR	A	002	0AFB	0146	0138* 0139 0139 0532* 0533
LINE	A	001	18B3	1539	1531* 1534*
LINK	C	001	0216	1682	0074 0101 0116 0140 0153 0182 0195 0210 0227 0240 0320 0377
					0404 0410 0437 0443 0472 0478 0510 0516 0529 0561 0574 0605
					0633 0639 0668 0674 0704 0710 0721 0747 0761 0797 0836 0844
					0860 0884 0908 1085 1453
LIORST	A	043	1C02	1640	0523
LIOSNS	A	004	1486	1182	0401 0434 0469 0507 0630 0665
LOAD	C	001	022A	1683	0846 0956 0962
LS	A	001	1915	1587	0271* 0272* 0273* 0274* 0276
LSCK	A	002	1917	1588	0399* 0432* 0465* 0467* 0500* 0502 0505* 0554* 0555 0559* 0560 0800*
					0603* 0626* 0628* 0661* 0663* 1138 1231 1234
LSCKK	A	022	1BE0	1639	1196
LSCAR	A	014	1C88	1645	0547 0593
LSID	A	002	148A	1167	1192*
L3741	A	001	000C	0005	
MAPS	A	004	17D9	1464	0148 0190 0235 0373 0406 0439 0474 0512 0525 0568 0635 0670
					0706 0717 0756 0793 0832 0856 0952 0964 1101 1438 1449
MAPSS	A	034	1C53	1643	1466* 1467* 1468* 1469* 1474
MSG1	A	040	1A03	1619	0031 0032
MSG1B	A	001	198C	1616	0031
MSG2	A	040	1A53	1622	0036 0037
MSG2B	A	001	1AA3	1620	0036
MSG4	A	040	1AA3	1624	0565 0566
MSG4B	A	001	1AE3	1624	0565
NCODD1	A	004	0CBA	0341	0306 0308
NCODD2	A	004	0CD5	0342	0310 0312
NCODD4	A	004	0CF0	0355	0314 0316
NCODD5	A	004	0D0B	0363	0318
NCOD1	A	004	0C9E	0323	0299
NCOD2	A	004	0CA6	0336	0301
NCOD4	A	004	0CAE	0337	0303

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
NF	A	004	171F	1387	1379* 1384* 1385 1386* 1400*
NFF	A	004	1735	1394	1380* 1391* 1392 1393* 1401*
NID	A	001	1518	1591	1184* 1192 1198 1201 1204 1207 1211 1213
NCRES	A	027	1D7C	1660	0950
NORM	A	004	143A	1154	1151
NOSEE	A	025	1D61	1659	0962
NTPST	A	027	1D28	1657	0854
N000	A	002	18CE	1557	1695
N001	A	002	18D0	1558	0285 1119 1125 1128 1182 1185 1253 1269 1371 1375 1485 1696
N002	A	002	18D2	1559	1122 1353 1354 1400 1401
N003	A	002	18D4	1560	1412
N004	A	002	18D6	1561	1089 1239 1303
N018	A	002	18D8	1562	1069 1074 1079
N019	A	002	18DA	1563	1006 1011 1016 1022 1027 1032 1037 1043 1048 1053 1058 1063
N02S	A	002	18DC	1564	1250
ODD	A	004	1C93	1647	0589
PATRN	A	002	1919	1589	0391* 0398 0424* 0431 0457* 0464 0492* 0499 0618* 0625 0653* 0660 1188 1233 1507
PRINT	C	001	021A	1664	0029 0034 0065 0090 0121 0170 0215 0285 0367 0520 0544 0563 0590 0712 0751 0851 0947 0959 0986 0991 0995 1095 1131 1193 1257 1275 1426 1444 1471 1516 1536
PRNT	A	004	18AF	1536	1532
PRT	A	091	1F49	1674	0039* 0040 0040* 0118* 0119* 0120* 0124 0126 0126* 0167* 0168* 0169* 0173 0175 0175* 0212* 0213* 0214* 0218 0220 0220* 0327* 0330* 0338* 0365* 1092* 1094* 1098 1100 1100* 1139* 1140* 1143* 1146* 1149 1154 1156* 1159* 1162* 1165* 1172* 1200* 1203* 1206* 1209* 1215* 1216* 1218* 1219* 1221 1222 1224* 1226* 1228 1236* 1252* 1256* 1260 1262 1262* 1281 1281* 1282* 1284* 1286* 1289 1290 1293 1293* 1299* 1300 1300* 1431* 1433* 1435* 1490* 1491* 1494* 1495* 1498* 1499* 1502* 1503* 1509* 1513* 1519 1521 1521* 1539 1540 1540*
PRTT	A	004	18BD	1541	1530* 1533*
PUTBAK	A	006	1371	1CE4	1105
OS	A	004	176E	1413	1409* 1412* 1416 1417 1419
OS.	A	004	1772	1415	1411
QUES	A	004	175D	1409	0071 0096 0135 0177 0222 0263 0395 0428 0461 0496 0550 0596 0622 0657 0693 0738 0780 0820 0878 0901 0927
RDY	A	C14	1CAE	1646	1429
REPIT	A	004	123D	C951	1003
RWCV	A	037	1EC0	1671	1433 1698
RSIOC	A	049	194E	1613	
RTN#	C	001	0A03	1689	0843 1137 1141 1144 1150 1157 1163 1515
RTN0A	A	001	0DE3	0488	0455
RTN0B	A	001	0E42	0536	0490
RTN0C	A	001	0E98	0585	0541
RTN0D	A	001	0EC7	0614	0587
RTN0E	A	001	0F03	0646	0616
RTN0F	A	001	0F3F	0683	0651
RTN01	A	001	0A51	0061	0026 0041
RTN02	A	001	0A6E	0086	0063
RTN03	A	001	0A8B	0111	0088
RTN04	A	001	0AFD	0183	0113
RTN05	A	001	0B4F	0205	0165
RTN06	A	001	0BA9	0251	0207
RTN07	A	001	0D37	0367	0253
RTN08	A	001	0D6F	0420	0389
RTN09	A	001	0DA7	0453	0422
RTN10	A	001	0FC1	0729	0685
RTN11	A	001	1022	0771	0731
RTN12	A	001	108A	0811	0779
RTN13	A	001	1118	0869	0813
RTN14	A	001	1154	0894	0871
RTN15	A	001	1190	0918	0856
RTN16	A	001	1223	0979	0920
RTRN	A	006	1257	1606	1577
SBYTE0	C	001	0208	1692	0115 0209
SBYTE2	C	001	020A	1693	1410

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SERID	A	002	15D4	1279	1268*
SHDD	A	004	15AC	1263	1254*
SHORT	A	006	1DAA	1662	1512* 1513
SID	A	002	15A5	1261	1249*
SIOCK	A	022	1C21	1641	1278
SIOC4	A	021	1EEE	1673	0715
SIOHD	A	004	1576	1248	0687 0733 0775 0815 0873 0898 0922
SNCKMS	A	012	1E72	1669	1134
SNRID	A	002	13F6	1135	1127*
SNSERR	A	004	13BB	1119	0144 0186 0231
SNTME	A	010	1E66	1668	0118 0167 0212
SPL2	A	006	152C	1224	1212 1214
SSWC0	C	001	0080	1691	0115 0209
SSW10	C	001	0080	1690	1410
STBR	A	004	0BFA	0283	0279* 0284 0284* 0286
STLCR	A	033	1AC4	1628	0119 1139 1140 1203 1494
TAERR	A	004	16CF	1357	1318* 1330 1334 1353*
TA1	A	004	1674	1333	1322* 1328 1347 1347*
TA2	A	004	166A	1329	1321* 1348 1348*
TA3	A	004	1663	1327	1320* 1349 1349* 1355
TBERR	A	004	16D7	1359	1319* 1339 1343 1354*
TB1	A	004	168C	1342	1325* 1337 1345 1350 1350*
TB2	A	004	1682	1338	1324* 1351 1351*
TB3	A	004	1678	1336	1323* 1331 1352 1352* 1358
TC	A	004	1693	1345	1340 1360
TEMP	A	002	18FE	1585	0800* 0839* 0841 0942* 1007* 1012* 1017* 1464* 1465
THD	A	009	1CE6	1652	1093* 1094 1484* 1488 1492 1496 1500
TIOERR	A	004	178F	1444	0099 0785 0939 1697
TIOERD	A	004	1787	1426	0076
TNF	A	004	170D	1382	1377* 1396 1398 1398* 1402
TNFF	A	004	1723	1389	1378* 1399 1399*
TOBSY	A	023	1CC5	1650	0093
TORDY	A	024	1CDD	1651	0068
TRL	A	002	083D	0188	0131* 0180* 0181 0181
TSCYC	A	036	1BBE	1637	0298
TSIO	A	014	1C31	1642	1256
TSPAT	A	040	1DA4	1661	1508 1509 1510 1512
UNPACK	C	001	021E	1685	1505
VNOC	A	042	1C7D	1644	0843* 0589*
WORK	A	001	190D	1586	0936* 0937 0983* 1084 1152 1229
XPCT	A	001	151C	1552	0701* 0788* 0827* 1272 1296
XPT	A	002	163C	1314	1121* 1233* 1256* 1327 1336
XR1	C	001	0001	1686	0041* 0042 0276* 0277 1152* 1154* 1222* 1228* 1250* 1319 1380 1417* 1418 1465* 1466 1467 1468 1469 1476
XR2	C	001	0002	1687	1149* 1221* 1229* 1289* 1312 1379

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

OBJECT CARD LISTING

THE CHARACTER ' INDICATES A BLANK COLUMN AND THE CHARACTERS D E H INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

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'GBK GBD 'PN 55 58420 EC 824870 3741 ATT TEST W/ O WRAP CONNECTOR 84080840'''''''' ''''''''40110000
T+-Y:EAD ' ' B-7 ""4A8 ' D BVG /OH _ _ EEP@E 4C-OH*BF-R EFV<EEA*HCEY-KJ* H0-DHML&AB-*'B Z <BYD E U40110001
T+-Z5A33-EU32/0E @B&Z<OH*BHUC/OH* HD&D BW# /OHEJJ- *7HE/OH*PP- B|<E ' /$ /1:G - H5@B G /Y 6 H40110002
T+-_C0JJ**1MB$OH* PP- &|<EBE#" /OH C 0 H"LS -T D H OC L:=A9WCB -FJ. D|D%-F%BG /ZFO1* I&H< :&H40110003
T+-..CEY-KJ*H<MD 03%EEE#01JJT+<D< .|*EBE#01JATYO1* PP- &|CABB>%( &. .B>X -&HOOH*L>8 ''''' 1:@40110004
T+-'W EEGE*WG&*B G SI ' @BG /QD _ |C U:=A'WCAD-B/. O|D%-B@BG /ZFC1* I&H<O/*IG4. /1) )@CO 43<40110005
T+-_/|CACB3A( &% *B3? -&HOOH*L>0 '''' DOH*P&O:ADH* BHU DOH*EE-H E:U 8- HHOA BE-O1G?- :R-0 6K@40110006
T+->*C/EGF@Y&K1@ HOH*BFURSG4V Z&1 EG4U-K%BGE570|CD OJ&>FC& .V->MOHC BE%BGD#% ''''' A*B GE*U 8B 40110007
T+-7P$AG /OH$& P /OHDA- ((8BG /Z E1A>@&H$A&/:"O1* FP- &|CEAF|H16/T 2<H&Q@TEEF|HO&JU |<DH RJ-40110008
T+-OKFJDOJAUL<DK RE*HAFJH4 &75| RGLOAB"%* ' O C ."TY FJ4+ ?0B"% | &75F( 9"07#0I .@T4 EK840110009
T+-1(&1U)OHD<VC5 LFJ7 -&1=|EHRG*B ACHQ*OAL)OHD<XT4 OFJ7 -&2V|&ORG*B ACHO8&AU)OA <>TS FJ4 LI-40110010
T+-2HOA <>T-&FJ7 D 3N+B RG* &C(M 8AAU)OA <&C-HFJ7 D 30+ DFG* &C&? /OHO||D$S<BGCHY @E/% JQ440110011
T+-3CS OPGOO$V8@ GCJU<E/@EF7" /04 R||D&R"HGE232F6- 2/C&@*A_WCBD-DA_ Y0H*(FL31F4M8&AU )OA RRQ&0110012
T+-3=C<EE&/%>OH* <4T31F2#2/38E&/_ E+A RG* &C+UB@/% >CH*<@L31F2#2/2< &'A_E+ &RG* &C&& @B/% 9-Y40110013
T+-4S.%EGC&-&EJ% >EY*H||M&JL31F2@ <GA@.F4$ /CHEO/- $HM FOH*OZ@BGE*W HM*BG SI A%BG /Q G 4 :8<40110014
T+-54&CCAFJUQ@<B GF C1OH*PP- &|CE AFJU0&JUFOH*MS - 1OH*EE%BGE*WHU*B G SI A@BG /OH 6 XC D PLH40110015
T+-67FJUQ@%BGF C 1OH*PP- @|CEAFJU O&JUPOH*MS T1OH* EE%EGE*WHU*BG SI &<BG /QI 7TC D RFJ- :YD40110016
T+-7D5%EGF C2OH* FP- &|CEBFJUO&/U P| RE%BGEH-I8%B G /% /1-RSJG /OH S& X /OHDB- +&-0 AFJU 3-H40110017
T+-EVF4. /1- &%B GE570|C01&/UR<DH RE04 F+8RE"HAGTO FJ8 /1KHB?. /OH COH*P6QUJOH*BHU HOH* JR840110018
T+-9- /& /OHEO5% *@4 <OH*P6QU&OH* BHU <OH*EE-% C2- < 11*GH" /OHEJT- *548.OH*PP- @|CE DF+H :ED40110019
T+-:$<D&RE04AF+H RE"HADTEDF+ OJAU PC&COBAUFOHDEE%E G /.FRADTOH*P6QU LOH*BHUAXOH*BE-0 C%* *.<40110020
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EC NO. 824765 824870 PAGE 18

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

OBJECT CARD LISTING

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

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T+-#DC <*¬J2LOH* BFUC@GK_ .<BGE57 O|CO1JATU<D&RE3E DF( CJAUPOH*BE-4 C0<< JURF+& /1- '* ':D40110021
T+-8J/1))@CO@<MM RFLAEFJ1&@ AUOOH* MSAC50H*BE%BGE*W I<*EG SI D<BG /Q + B"C CRFJTDOH* Q |M "9Y40110022
T+-'<OH*PP¬ B|CE EFJU0JJUP| RE%B GEH-J'*BG /$ /1¬ RSL( /OHS&AG /OH CC0 |O*BGEPE?8%P T&<M NR*40110023
T+-=GS*GB4@N 2)P T1)XR%(¬T&{|A9@| HK4A OH+F?3OOF|Y # JTAOH*PP¬ B|CE AF(#3& HOJJT@+ D Q0¬H @1 40110024
T+-"BC#A@DAU*OH* N%A. /OHOOH*P6QV J0H*BHU K0H*BGE%B G /.BEJ#>&A. /1¬ RSH. /OHS&A. /CH OD O.D40110025
T+-"'DE. /1N6%(X E@%FT&<PNO*.L1MC 15;|E5)XU5=( 4&G TC&/.0#HP?@BGE57 O|CO1&JT;84 B84 D<DK JSM40110026
T+/ @F|C@DAT#0I BE%BG /.BGJ5H&A| /1¬RSPG /OHS&A| /OHCD& 5S%B@EPE 18%PT&(XEO@J O&G L44 $H440110027
T+/A54B@TC@/.6DA &CA 6DA OHHP?@B GE570|CO1&JT;84C OHHP?3AEF|0@ 1U *OH*N%AL /1A"OH* P6QU 4HB40110028
T+/B>U*BG SI E<B G /$3& -OJJT=OH* &:/H DJT /1N6%>. EE4CW6@*XT1MCCO)| L&{|A8@|HK4A &DA &D : H40110029
T+/CZ&<EBE#" /1) )@C0B<MDQ7?(B CA EF|C8AJU*OH*N%AP /1CTOH*P6R 1OH* BHU N@%@BE?( BCA EF|8 ¬BD40110030
T+/CU|& O"¬HACL4 NE-| &HOOH*BH-C /OHEO/%)H4 OOH* F6Q%KOH*BHU OOH* BE/< DNL /1N6%3L O&<< :D@40110031
T+'E¬6_PT6)$L&|E 6>|A&:( 2OGCK4A &CA &<EBE#" /1) )&C0B<MDQ7?(C"@B G /QM AF&OH*N).L D5L 6. 40110032
T+/FE0*$A8*XC14C 2&+.T0)XT&<V/5U_ &CA &2C /1))&CO &<MC03%EBE#"3J|" /OHDE& KH@BG&PE 58%M RDM40110033
T+/GN@4CA5*J 6*P S1:( 51R-5_) 48G TOB/.&DA OHHP?&E GE570|C01&JT+@AD <DHH:3-0B>.2UCM O&/U )!U40110034
T+/H6CL-CF632D " A&/:"84 H<DH0"%B GD+. /OHEO/%)¬D Q0H*P6RAKOH*@HU Q0H*BH-C /OHEO/U )QM "=BH40110035
T+/I.E&BGE*W&M*B G SI E@BG SV EYC ""00CF&4 00C < 0*%BG /ZB<17)&.& /OHE SE; *BG /Y F(1B M/<40110036
T+/HF+<BG SI #%B E@T4+ & CF(YO&AT =OH*L:=.N8UC0C-D 1TE<DQ0"%BGD77 S5:I *-8A <Q6TA GF|8 ¬&%40110037
T+/.A0H*L:=.N8UC 7C-D 1TE<M Q3%B GD77L2)R & 8A < Q6TECF<# /1(#4BX O&|<+ & CF(Y1J/T +OH* $0H@40110038
T+/.@D77L2)R *-8 A <Q6TEGF<# /1( #4BXO&|#+ & CF(. A&J.%0H*L:=|I5UC 1C-D 1TEOH&K=*B GD7% OR&40110039
T+/<7E&XO3|&+ & CF(.AJJ<<OH*L:=| I5UC5C-D 1TEOH@ LGBEGD77T2)R *-8 A <Q6%EGD3. /1( #8BU KE%40110040
T+/(25UC7C-D 1T Q84H OH*L:=.I5UC 5C-D 1TG84Q OH* L:=.I5UC6C-D 1T Q84* OH*L:=.I5UC 7C < 0#440110041
T+/+_ <RC*BG /Q 6BATO( -&5 ODGV0 OTG1H:P 0 G4# &P OHG1Y*9%BG /. B01*I&AUCD/*IG4. /1* *0U40110042
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EC NO. 824765 824870 PAGE 18A

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/|YERALOH*BHU ROH*L*LOHF(4BA|	HC OO| (—Q4T& HD*O< JQ= 6BAT	&(-L9 0 D*Q CQ	HF(3CD40110043		
T+/&T(-H/3BG /.	BCA92& * OYC3-D	<C Y¬AAD>C 3¬F1D	"|&&H "HAA-0JG1H	E5T4EB-|2 &O<C/3	FF3Y HLX40110044
T+/J:OH*OZ3HBGOQ	*A&YC&-DGO-DRC¬H	GA<HAG1Y<BJ3CG&U	*A&YC3YDFC U¬E13	"OH*QX 0+GOQ*'L4	EB-< L.440110045
T+/KR&YDFC &¬F/3	5OH*OZ3B&>DC|%B	GFI3 /1C"C Q:*J4	&OH*CZ3B& 6BAT	&(-HV&OAFJ% CQ	HF(OJH40110046
T+/LH(-HD-4AFJ*	RF¬HAA<BG < AK	:FJ. /OH&O/C&BC |¬CRF"HAA-O&G1H	RTC72FJ72 &O<C13	GF.3 ¬Z-40110047	
T+/N|¬&RF"HAA-O	MG1<&:375FJ72 &Q	<DA3GF03 /1SX|¬H	RF"PA<T75FJ72-K%	<BJ3CG&U<BJ3PG|"	/1- NOM40110048
T+/NHX O+GOO*'&O	+G1Y3**BGFH¬B /3	FO-D¬F?HGG OIGC<	*"&3GFIO<C/3FG|P	/1SXO-D¬A%HBF&7	/1Q $TH40110049
T+/OE&JUPCH*QX O	AE7CRF&OAET3RE3B	GET3<A/3&GJC /1S	XC-CWD/TOOH*HZ36	HEP3< AOV 6BAT	#(- *YD40110050
T+/P EQ4<GA3$	6BAT&(-N.OO|G?8	*<*BG /ZEC1'I&	<O/'IG4. /O (-	N>&O E)& CQHF(4BAQ	"S<40110051
T+/P#+-4 FJOQ="H	A3<B6 /.BE/O/& M	<O/'IG4Y<C/3FF&.	/1SXC U¬ 141OH*	QX 0+GOO*'*BGFH¬	B /3 *AU40110052
T+/Q6A%HAG1. /1S	/F|O<C/3EG1? /1S	*C O+1U*C DO|/T	&CH*O|OOFG?HJD O	+G1Y¬F3BGFH*+ JQ	:F(Q 32-40110053
T+/P1CH*	4EAEE(HD4T&AE_Y	3 JRU| DOE3OAEXM	& JR2| DO-3OAEY4	3 JO#3/ H+ DO|¬H	&P?H N&Q40110054
T+/E%/C*3 JO'3ZA	M+ DC|H&3T-AET#	2DD#2/O*3 JO=3ZA	&++ OT* & + AR	5EXM+ AR.E%X+ AR	UEW& *E*40110055
T+/3XC- CTJE(C-	O-1ECC- O¬AR3C0D	O4/TKC0DO6/TKOH*	OQ3I3 C /1R#|EO	<BGEZ< CQHF(4BAQ	$9-40110056
T+/*S#-0AE7& O	AE> CQHF(4BA)	| DPCTCAE2&4 /*	S(DP+C- E_"2D *	3@A*-3Y*D||DPHC0	0#U40110057
T+/))+ O3|H&A33	0E3&2/O&3BJ*6|	CS E0# D C-	PC/*+C- FIA*UC0D	PH/TKC0DP+ATKOH*	PCL& :.440110058
T+/:3EA)1+H BB?H	&E-3AE7DQS<B&	*O-H O DPSTMAE7E	< &HC3<BGE63 /OH	E0-8*.U ACB-¬E1:	$OH* 8.840110059
T+/¬LFIO<IA3*C%C	/1SXCA-¬A1#ROH*	QX<BGE*W& %BG SI	*BGB/G /OHE0-4	*YD B0H*P6Q*/OH*	BHU 3 040110060
T+/-+ %BG /Q4BAT	=(&DC"/-BGD- F <	*K& Q /1H J-CGEH	A0H*BFYQSGE|&/OH	4BA-IC *9& (--	Q4C& 9S 40110061
T+//IEAS$|¬C*9*	AFB&<CA&XFQO&K1B	Y|¬H*9$* AFCQ<EA3	.F%&3K18%|¬<*$*	AFD-<DJ3YF_Q3K13	Z|¬H ND040110062
T+/SDG+F J/ECAH	¬.A%J|D%¬.*B6 /3	BFJU)X-OXG1Q)Z 4	AGFOC=|HAD-OAGE-	)X-0EG1D)D--CFH4	H 3 '-840110063
T+/S"/CHEJN%¬KMB	-CEY¬KJ*HOH+P?0B	G 4BAT |HDO%"H	GBC&+F< &-/S3CH*	BF-A$G4U<O/'IG4.	/0 0--40110064

DATE 16AUG74 15NOV74
EC NO. 824765 824870

PROG ID 401-1
PAGE 19

4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/T: : JTA3$	(OH*QO- D -	C & D- L A4 -FZ	NNEY& ANC5N DDC	D"""=|'NOH*KN"C	OF<H ¬1%40110065
T+/LS			CO1)LO9*N 9_X	A$4CC5_PN1*|T5_V	&(N 1- 40110066
T+/V05>|E&FA O'¬	U&(LA:DCD6)$P&(¬	O3%PFK3XF&+.OE4C	T9(XN&(¬O3%PR&<.	A0'I 5_N O)PD&(X	E4'O 7:U40110067
T+/W.0*J 5'XO1'X	A5D?F9(PC3BXO5MC	R!+¬I8>|E&)XE5($	V1"C3'"L16<V/5UC	CO*.L1M_ &<GLO_R	6*N 4/<40110068
T+/XW5($V1MCT2<N	9_XA$4CC5_PN1*|	T5_V.&+|H1)N 5&P	R1_3R5DCA&+.Y8>|	E5DA &DA &DA &DA	&D KBH40110069
T+/Y/&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DCR1:.	E&4CA5*J 8>|A6:(	.&DA &DA &DA &DA	&D *A040110070
T+/Z*&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DCD0:|A&<G	D1(U 1-U40110071
T+/DP1:.S&(XE1BX	S&BPR&<$A2)|U6*N	.&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&D "2040110072
T+/.K&DA &DA &DA	&DA 8>|A3=LS&<.	Y8&N-4BFN1=|M&<|	C9(FT&(XE1BXSE&P	R2DGO&+|RO)PS1%P	R&(< 4R-40110073
T+/%(2)FE&%LA&BE	0*LD6*PS&UCR1*¬	I8>|E6*LIO*¬N5>.	T2*(O>TT1OCD0:|	A&+|RO)PS1%PR&(X	E1&U JR440110074
T+/_H&>|E6*P&&<|	YO'|E&<GNO)|Y&%X	S&<|H1*|KK&1*1&.	X&<|YO'|E&<$A2)|	E1D_ 5MCC5%LE&+)	.PE0 EM840110075
T+/>CO_$T2CCEOUC	C:<|LI%I 1%GI4$PD	DK4CN6<|O1<N 94_	*P<GL44CE&UCC:<|	L1:I 1%GI4$PDK51	*0)< 2$%40110076
T+/>=44CE0>) O=T	C4$PS&<$A2)|E1D?	T1:.T&<LA&&E 8*X	A5:.F1)V 1+LR2)P	G&<P&&<|YO'|E&U?	D2*D RZ&40110077
T+/791'FC8>|I04C	3:+|E4$XOQ:.N&UC	C5_LP0)XE&<|M1*|	KK'|I5UCF0*XL1*J	8*R 6*PS1:(4$P	N1=< :KY40110078
T+/042CCC5>LN84C	R1*¬I8>|E6M_ 1<X	A1'PO&>|I04CB:+|	E&<|P1*|KP=|EE>(	0*.I4$XT:DCT5UC	G5U JYH40110079
T+/178*R 3"¬4$MC	M0)¬SE4CP0*¬E&|C	0$DCE5:|R:DC0K*|	O0*J/8%PN8%N 1<G	T0%CA1<LP1:.S&(X	E1$U :T&40110080
T+/2D8>|E6MCW2:|	M&DA &DA O%XT&(¬	A9=|E6)PSK$PV1)P	C1<J $"¬43MCI$UC	B9+.YK"|7'|E 2:I	6*N 6S*40110081
T+/3VO*LYK=|E8>(	$"¬43MCF5_V 5)$	T&<.U8>)/.E$PS84C	3'"L16<SCEMCN&>(	6*PA1+/.5MCC5%L	E&+* JY&40110082
T+/4-K"1 &MC2&|(	'DC5&|R '6CE07E	O>TT1OA-1*.2&<.	YE&N-P<PR6)$RP(X	E0*J/9_XI8$N 43G	T0$- ELO40110083
T+/5S&(FC84CR1:.	E&47I5:|E6)XU5=(	1'PAO_|E&(XE8%P	T&<|H1*|KK*POC(%	P&(|A8$\|H&<$A2)|	S&+< 5A-40110084
T+/6D5UCS1:(.5)R	-5_) 4GTO/ 1%G	I4=I 8*R 6*PS1:(	.4*3A1FGS1)PS1MC	W2:|H&+|E8>(58G	T8$M *K<40110085
T+/7J6)N C+¬X9=)	-&+|+1MA Q+¬XODC	T1:.T&<CB2)|I8=/	5%R $"¬43MCT5UC	R1)GE0=($¬N 2)P	V0)< &CU40110086

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4011 3741 FUNCTION TEST WITHOUT THE WRAP CONNECTOR

OBJECT CARD LISTING

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

T+/8<2*J 0'$M5<G  N1+I.1(R 8>TS8@P  M&(XE8%PT&<GN1DC  S8@GR86_ @¬R 8@X  M1;1.1;¬P1*|7&(¬  R5%< JI440110087

T+/9G1;.S&<|H1*|  K&<GF8@PR&<PA0@/  8>TS8@FM&(XE8%P  T&<GN1DCS8@GR84?  I5;PA4@XD&<|O5(L  A5*& K&*40110088

T+/:B&+$A8UCA0@|  E5=|E1D_ &+¬X94C  N8%PN8%N 8@TE&+.  E5;.E&<|H1*|KK51  *5)$T1N1*&<XF&<E  9_U :-@40110089

T+/:'0)) 0'$N5*P  C8'$R&<X5&<GT8@G  C2<PDE'XE5($V1MC  IE4CA5*J 1(R 8>T  S8@PM&(XE8%FTE4C  S8@D E9*40110090

T<A#>6;(.2*R 0'$  N5*PC8'$R&<X5&($  F1UCT2<PNE"|7'|E  2)PT1)XR9(¬T&<|  H1*|KK0                  28440110091

T A'H&                                                                                          RB840110092

EB/E*E7*=¬DC"PH$  ="7M&F|  |  C  F%  ASC  R A  S0  0                  11350908741  121745#840110093
```

LAST PAGE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                            2 *                                    LAST CHG :08 01 74
                            3         DECK  4
                            4         SEQ   0
   0000                     5 LSIOC   START 0
                            6         TREP
   CA00                     7         ORG   X'A00'
                            8 ********************************************************************
                            9 *       3741 FUNCTION TEST          USING -WRAP CONNECTOR          *
                           10 ********************************************************************
                           11 *                                   SECTION PREFACE                *
                           12 ********************************************************************
   0A00 4021          0A01 13         DC    XL2'4021'           PROGRAM ID AND REVISION LEVEL
   0A02 00            0A02 14         DC    XL1'00'             SECTION FLAGS
   0A03 01            0A03 15         DC    XL1'01'             CURRENT ROUTINE NUMBER
   0A04 0000          0A05 16         DC    XL2'0000'           RESERVED
   0A06 0A0D          0A07 17         DC    AL2(BEGIN)          FIRST ROUTINE ADDRESS
   0A08 FFFF          0A09 18         DC    XL2'FFFF'           ERROR TABLE ADDRESS
   0A0A 405000        0A0C 19         DC    XL3'405000'         SECTION PREFACE UNIT DEF. TABLE
                           20
                           21
                           22 *       INTRODUCTION      TELL C.E. TO SYSTEM RESET AND START.     *
                           23 ********************************************************************
   0A0D 01            0A0D 24 BEGIN   DC    XL1'01'             DUMMY ROUTINE SETUP.
   0A0E 00            0A0E 25         DC    XL1'00'
   0A0F 0A51          0A10 26         DC    AL2(RTN01)
                           27
                      0A11 28 BEGINN  EQU   *
   0A11 C0 87 021A         29         B     PRINT               PRINT BEGINNING INSTRUCTIONS
   0A15 41            0A15 30         DC    XL1'41'
   0A16 27            0A16 31         DC    AL1(MSG1-MSG1B)
   0A17 16FA          0A18 32         DC    AL2(MSG1)
   0A19 40E0          0A1A 33         DC    XL2'40E0'
   0A1B C0 87 021A         34         B     PRINT
   0A1F 06            0A1F 35         DC    XL1'06'
   0A20 27            0A20 36         DC    AL1(MSG2-MSG2B)
   0A21 1721          0A22 37         DC    AL2(MSG2)
   0A23 3C 40 1D69         38         MVI   PRT+1,X'40'         SET UP 'CLEARING' BYTE.
   0A27 0C 5A 1D68 1D69    39         MVC   PRT(91),PRT+1       CLEAR PRINT FIELD.
   0A2D C2 01 0A51         40         LA    RTN01,XR1           RESTORE REAL ROUTINE 01 ADDRESS.
   0A31 34 01 0A07         41         ST    FRTN,XR1
   0A35 3D E0 0A4C         42         CLI   HPLXX,X'E0'         CURRENT HALT -E0- ?
   0A39 F2 81 07           43         JE    ALTER               JUMP IF SO.
   0A3C 3C E0 0A4C         44         MVI   HPLXX,X'E0'         SET UP FOR HALT -E0-.
   0A40 F2 E7 04           45         J     *+7
   0A43 3C E1 0A4C         46 ALTER  MVI   HPLXX,X'E1'         SET UP FOR HALT -E1-.
   0A47 C0 87 0222         47         B     HALT                INLINE HALT -E0- OR -E1-.
   0A4B 40E1          0A4C 48 HPLXX   DC    XL2'40E1'
                           49
   0A4D C0 87 0A11         50         B     BEGINN              REPEAT IF NO SYSTEM RESET.
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                           52 *********
                           53 * RTN01 *
                           54 ********************************************************************
                           55 *                                                                  *
                           56 *       ROUTINE 01        THE PROGRAM SENSES FOR THE WRAP          *
                           57 *                         CARD ID BITS -F900-.                     *
                           58 *                                                                  *
                           59 ********************************************************************
   0A51 01            0A51 60 RTN01   DC    XL1'01'             ROUTINE NUMBER
   0A52 00            0A52 61         DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
   0A53 0805          0A54 62         DC    AL2(RTN02)          ROUTINE 02 ADDRESS.
                           63
   0A55 C0 87 021A         64         B     PRINT               PRINT ROUTINE TEST HEADING.
   0A59 45            0A59 65         DC    XL1'45'
   0A5A 2B            0A5A 66         DC    IL1'43'
   0A5B 189A          0A5C 67         DC    AL2(IDBIT)
   0A5D 40A1          0A5E 68         DC    XL2'40A1'
                           69
   0A5F C1 40 0A83         70         TIO   SPECL,X'40'         BRANCH IF 3741 IS NOT READY.
   0A63 F3 40 0D           71         SIO   X'0D',X'40'         ISSUE RESET TO 'CLEAR' 3741
   0A66 C1 42 1352         72         TIO   BUSY,X'42'          BRANCH IF 3741 IS BUSY.
                           73
   0A6A C0 87 13C3         74         B     QUES                TEST FOR SSW10 ON.
   0A6E F0 3C 3C           75         MPL   X'3C',X'3C'         HALT -FF- IF ON.
                           76
   0A71 31 41 16A7         77         LIO   H3CB0,X'41'         SET FUNCTION REGISTER TO DIAG MODE.
   0A75 31 45 1699         78         LIO   H0000,X'45'         CLEAR DATA TRANSFER REGISTER.
   0A79 31 42 1699         79         LIO   H0C00,X'42'         CLEAR LENGTH COUNT REGISTER.
   0A7D 31 44 16CF         80         LIO   DATA,X'44'          LOAD DATA ADDRESS REGISTER.
                           81
   0A81 30 43 0AA1         82         SNS   SNS01,X'43'         SENSE THE TRANSFER LINES FOR -F900-.
   0A85 0D 01 0AA1 0A9F    83         CLC   SNS01(2),SNS01-2    ARE THE ID BITS ON ?
   0A8B C0 81 0216         84         BE    LINK                RETURN TO DCP IF ID BITS ARE ON.
                           85
   0A8F C0 87 021A         86         B     PRINT               PRINT ID SENSE CHECK.
   0A93 C2                 87         DC    XL1'C2'
   0A94 0F                 88         DC    IL1'15'
   0A95 18A9               89         DC    AL2(IDCK)
   0A97 4020               90         DC    XL2'4020'
   0A99 C0 87 155B         91         B     ERROR               DUMP I/O TRANSFER LINES.
   0A9D 03                 92         DC    XL1'03'
   0A9E F900               93         DC    XL2'F900'           -EXPECTED ID BITS.
   0AA0 0000          0AA1 94 SNS01   DC    XL2'0000'           -ACTUAL ID BITS.
   0AA2 FF            0AA2 95         DC    XL1'FF'
   0AA3 C0 87 139L         96         B     MAPS                POINT TO MAP CHART.
   0AA7 9091          0AA8 97         DC    XL2'9091'           -PAGE 909, ENTRY 1.
   0AA9 C0 87 0222         98         B     HALT                ERROR HALT -20-.
   0AAD 4020          0AAE 99         DC    XL2'4020'
   0AAF C0 87 0216        100         B     LINK                RETURN TO DCP.
                          101
   0AB3 30 43 0AA1        102 SPECL   SNS   SNS01,X'43'         SENSE TRANS LINES FOR -0000-.
   0AB7 0D 01 1699 0AA1   103         CLC   H0000(2),SNS01      ARE TRANS LINES ALL ZERO'S ?
   0ABD C0 01 1338        104         BNE   NTRDY               GO PRINT NOT READY ERROR IF NOT.
   0AC1 3C 5C 1D2F        105         MVI   PRT-57,X'5C'        GENERATE A LINE OF '*'S.
   0AC5 0C 20 1D2E 1D2F   106         MVC   PRT-58(33),PRT-57
   0ACB C0 87 136C        107         B     EPRNT1              PRINT THIS LINE.
   0ACF 0C 21 1D2F 18CE   108         MVC   PRT-57(34),NODN
   0AD5 C0 87 136C        109         B     EPRNT1              PRINT CONNECTOR NOT ATTACHED.
   0AD9 0C 1L 1D2C 18EA   110         MVC   PRT-60(31),HOOK
   0ADF C0 87 136C        111         B     EPRNT1              PRINT HOOK IT UP.
   0AE3 3C 5C 1D2F        112         MVI   PRT-57,X'5C'        GENERATE A LINE OF '*'S.
   0AE7 0C 20 1D2E 1D2F   113         MVC   PRT-58(33),PRT-57
   0AED C0 87 136C        114         B     EPRNT1              PRINT THIS LINE.
   0AF1 0C 16 1D24 179C   115 0000    MVC   PRT-68(23),INTRO    PRINT DO SYSTEM RESET, START.
   0AF7 C0 87 1382        116         B     EPRNT6
   0AFB C0 87 0222        117         B     HALT                INLINE HALT -E2-.
   0AFF 40E2              118         DC    XL2'40E2'
   0B01 CG 87 0AF1        119         B     0000                REPEAT IF NO SYSTEM RESET.
```

4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              121 *********
                              122 * RTN02 *
                              123 ************************************************************************
                              124 *                                                                      *
                              125 *       ROUTINE 02          WRAP-ARCUND TEST. LOAD DATA TRANS REG WITH  *
                              126 *                           -AA- AND SENSE THE I/O TRANS LINES FOR AN  *
                              127 *                           -F9AA-.                                    *
                              128 *                                                                      *
                              129 ************************************************************************
 0B05 02                0B05  130 RTN02  DC    XL1'02'             ROUTINE NUMBER
 0B06 00                0B06  131        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
 0B07 0B62              0B08  132        DC    AL2(RTN03)          ROUTINE 03 ADDRESS.
                              133
 0B09 0C 01 1954 16D1         134        MVC   PAT-2(2),CAA        STORE TEST PATTERN IN HEADING.
 0B0F C0 87 021A              135        B     PRINT               PRINT WRAP TEST HEADING.
 0B13 41                0B13  136        DC    XL1'41'
 0B14 25                0B14  137        DC    IL1'37'
 0B15 190F              0B16  138        DC    AL2(WRP)
 0B17 40A2              0B18  139        DC    XL2'40A2'
 0B19 C0 87 021A              140        B     PRINT               PRINT TEST PATTERN.
 0B1D 05                0B1D  141        DC    XL1'05'
 0B1E 12                0B1E  142        DC    IL1'18'
 0B1F 1956              0B20  143        DC    AL2(PAT)
                              144
 0B21 C0 87 131D              145        B     INITL               INITIALIZE THE 3741
                              146
 0B25 C0 87 13C3              147        B     QUES                CHECK FOR SSW10.
 0B29 F0 3C 3C                148        HPL   X'3C',X'3C'          HALT -FF- IF ON.
                              149
 0B2C 31 45 1689              150        LIO   HFAA,X'45'          LOAD THE DATA TRANS REG WITH A -AA-.
 0B30 30 43 0B50              151        SNS   SNS02,X'43'         SENSE I/O TRANS LINES FOR -F9AA-.
                              152
 0B34 0D 01 0B50 084E         153        CLC   SNS02(2),SNS02-2    ACTUAL SENSE THE SAME AS EXPECTED ?
 0B3A C0 81 0216              154        BE    LINK                RETURN TO DCP IF OK.
                              155
                              156 * ROUTINE 02 ERROR MESSAGE *
                              157
 0B3E C0 87 021A              158        B     PRINT               PRINT WRAP CHECK.
 0B42 C2                0B42  159        DC    XL1'C2'
 0B43 16                0B43  160        DC    IL1'22'
 0B44 1925              0B45  161        DC    AL2(WRPCK)
 0B46 4021              0B47  162        DC    XL2'4021'
 0B48 C0 87 155B              163        B     ERROR               DUMP I/O TRANSFER LINES.
 0B4C 03                0B4C  164        DC    XL1'03'             -EXPECTED.
 0B4D F9AA              0B4E  165        DC    XL2'F9AA'           -ACTUAL.
 0B4F 0000              0B50  166 SNS02  DC    XL2'0000'
 0B51 FF                0B51  167        DC    XL1'FF'             POINT TO MAP CHART.
 0B52 C0 87 139C              168        B     MAPS                -PAGE 916, ENTRY 1.
 0B56 9161              0B57  169        DC    XL2'9161'           ERROR HALT -21-.
 0B58 C0 87 0222              170        B     HALT
 0B5C 4021              0B5D  171        DC    XL2'4021'           RETURN TO DCP.
 0B5E C0 87 0216              172        B     LINK
                              173
                              174
                              175 *********
                              176 * RTN03 *
                              177 ************************************************************************
                              178 *                                                                      *
                              179 *       ROUTINE 03          WRAP-AROUND TEST. LOAD DATA TRANS REG WITH  *
                              180 *                           -55- AND SENSE THE I/O TRANS LINES FOR A   *
                              181 *                           -FD55-.                                    *
                              182 *                                                                      *
                              183 ************************************************************************
 0B62 03                0B62  184 RTN03  DC    XL1'03'             ROUTINE NUMBER
 0B63 00                0B63  185        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
 0B64 0BF4              0B65  186        DC    AL2(RTN04)          ROUTINE 04 ADDRESS
                              187
 0B66 0C 01 1954 16D3         188        MVC   PAT-2(2),C55        STORE TEST PATTERN IN MESSAGES.
```


4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0B6C C0 87 021A              189        B     PRINT               PRINT WRAP TEST HEADING.
 0B70 41                0B70  190        DC    XL1'41'
 0B71 25                0B71  191        DC    IL1'37'
 0B72 190F              0B73  192        DC    AL2(WRP)
 0B74 40A3              0B75  193        DC    XL2'40A3'
                              194
 0B76 C0 87 021A              195        B     PRINT               PRINT TEST PATTERN.
 0B7A 05                0B7A  196        DC    XL1'05'
 0B7B 12                0B7B  197        DC    IL1'18'
 0B7C 1956              0B7D  198        DC    AL2(PAT)
                              199
 0B7E C0 87 131D              200        B     INITL               INITIALIZE THE 3741
                              201
 0B82 C0 87 13C3              202        B     QUES                TEST FOR SSW10 ON.
 0B86 F0 3C 3C                203        HPL   X'3C',X'3C'          HALT -FF- IF ON.
                              204
 0B89 31 45 16B7              205        LIO   HFD55,X'45'         LOAD THE DATA TRANS REG WITH A -55-.
 0B8D 30 43 0BE2              206        SNS   SNS03,X'43'         SENSE THE TRANS LINES FOR -FD55-.
                              207
 0B91 0D 01 0BE2 0BE0         208        CLC   SNS03(2),SNS03-2    DID THE DATA WRAP OK ?
 0B97 F2 01 36                209        JNE   ERDTR               JUMP IF DID NOT.
                              210
 0B9A 31 45 1699              211        LIO   H0000,X'45'         CLEAR THE DATA TRANS REG.
 0B9E 30 43 0BBE              212        SNS   SNSET,X'43'         SENSE THE TRANS LINES FOR -F900-.
                              213
 0BA2 0D 01 0BBE 0BBC         214        CLC   SNSET(2),SNSET-2    DID THE TRANS LINES GET CLEARED ?
 0BA8 C0 81 0216              215        BE    LINK                RETURN TO DCP IF SO.
                              216
                              217 * ROUTINE 03 ERROR MESSAGES *
                              218
 0BAC C0 87 021A              219        B     PRINT               PRINT TRANSFER RESET CHECK.
 0BB0 C2                0BB0  220        DC    XL1'C2'
 0BB1 1F                0BB1  221        DC    IL1'31'
 0BB2 1944              0BB3  222        DC    AL2(TRLER)
 0BB4 4023              0BB5  223        DC    XL2'4023'
                              224
 0BB6 C0 87 155B              225        B     ERROR               DUMP I/O TRANSFER LINES.
 0BBA 03                0BBA  226        DC    XL1'03'
 0BBB F900              0BBC  227        DC    XL2'F900'           -EXPECTED.
 0BBD 0000              0BBE  228 SNSET  DC    XL2'0000'           -ACTUAL.
 0BBF FF                0BBF  229        DC    XL1'FF'
 0BC0 C0 87 139C              230        B     MAPS                POINT TO MAP CHART.
 0BC4 9192              0BC5  231        DC    XL2'9192'           -PAGE 919, ENTRY 2.
 0BC6 C0 87 0222              232        B     HALT                ERROR HALT -23-.
 0BCA 4023              0BCB  233        DC    XL2'4023'
 0BCC C0 87 0216              234        B     LINK                RETURN TO DCP.
                              235
 0BD0 C0 87 021A              236 ERDTR  B     PRINT               PRINT WRAP CHECK.
 0BD4 C2                0BD4  237        DC    XL1'C2'
 0BD5 16                0BD5  238        DC    IL1'22'
 0BD7 1925              0BD7  239        DC    AL2(WRPCK)
 0BD9 4022              0BD9  240        DC    XL2'4022'
                              241
 0BDA C0 87 155B              242        B     ERROR               DUMP I/O TRANSFER LINES.
 0BDE 03                0BDE  243        DC    XL1'03'
 0BDF FD55              0BE0  244        DC    XL2'FD55'           -EXPECTED.
 0BE1 0000              0BE2  245 SNS03  DC    XL2'0000'           -ACTUAL.
 0BE3 FF                0BE3  246        DC    XL1'FF'
 0BE4 C0 87 139C              247        B     MAPS                POINT TO MAP CHART.
 0BE8 9191              0BE9  248        DC    XL2'9191'           -PAGE 919, ENTRY 1.
 0BEA C0 87 0222              249        B     HALT                ERROR HALT -22-.
 0BEE 4022              0BEF  250        DC    XL2'4022'
 0BF0 C0 87 0216              251        B     LINK                RETURN TO DCP.
```

```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

                          253 *********
                          254 * RTN04 *
                          255 ********************************************************************************
                          256 *                                                                              *
                          257 *       ROUTINE C4        THE READ & WRITE CALL DRIVERS AND                    *
                          258 *                         I/O SELECTS ARE TESTED FOR ACTIVATION.               *
                          259 *                                                                              *
                          260 ********************************************************************************
  0BF4 04           0BF4  261 RTN04   DC    XL1'04'             ROUTINE NUMBER
  0BF5 00           0BF5  262         DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
  0BF6 0D0D         0BF7  263         DC    AL2(RTN05)          ROUTINE 05 ADDRESS
                          264
  0BF8 C0 87 021A         265         B     PRINT               PRINT THIS TEST HEADING.
  0BFC 41           0BFC  266         DC    XL1'41'
  0BFD 21           0BFD  267         DC    IL1'33'
  0BFE 1977         0BFF  268         DC    AL2(HD04A)
  0C00 40A4         0C01  269         DC    XL2'40A4'
                          270
  0C02 C0 87 021A         271         B     PRINT
  0C06 05           0C06  272         DC    XL1'05'
  0C07 1A           0C07  273         DC    IL1'26'
  0C08 1991         0C09  274         DC    AL2(HD06B)
                          275
  0C0A C0 87 131D         276         B     INITL               INITIALIZE THE 3741
                          277
  0C0E C0 87 13C3         278         B     QUES                TEST FOR SSW10 ON.
  0C12 F0 3C 3C           279         HPL   X'3C',X'3C'         HALT -FF- IF ON.
                          280
  0C15 F3 41 00           281         SIO   X'00',X'41'         ISSUE A READ CALL.
  0C18 C1 42 1352         282         TIO   BUSY,X'42'          BRANCH IF 3741 BECOMES BUSY.
  0C1C 30 43 0C8F         283         SNS   SNS6A,X'43'         SENSE I/O TRANS LINES FOR -FD00-.
                          284
  0C20 0D 01 0C8F 0C8D    285         CLC   SNS4A(2),SNS4A-2    READ CALL DRIVER ACTIVATE ?
  0C26 F2 01 54           286         JNE   ER4A                BRANCH IF NOT.
                          287
  0C29 F3 40 08           288         SIO   X'08',X'40'         RESET READ CALL DRIVER.
  0C2C 30 43 0CB3         289         SNS   SNS44,X'43'         SENSE I/O TRANS LINES FOR -F900-.
                          290
  0C30 0D 01 0CB3 0CB1    291         CLC   SNS44(2),SNS44-2    DID TRANS LINES GET RESET ?
  0C36 F2 01 68           292         JNE   ER44                JUMP IF NOT.
                          293
  0C39 F3 42 00           294         SIO   X'00',X'42'         ISSUE A WRITE CALL.
  0C3C 30 43 0CD7         295         SNS   SNS4C,X'43'         SENSE I/O TRANS LINES FOR -FF00-.
                          296
  0C40 0D 01 0CD7 0CD5    297         CLC   SNS4C(2),SNS4C-2    WRITE CALL DRIVER ACTIVATE ?
  0C46 F2 01 7C           298         JNE   ER4C                BRANCH IF NOT.
                          299
  0C49 F3 40 08           300         SIO   X'08',X'40'         RESET WRITE CALL DRIVER.
  0C4C 30 43 0CB3         301         SNS   SNS44,X'43'         SENSE I/O TRANS LINES FOR -F900-.
                          302
  0C50 0D 01 0CB3 0CB1    303         CLC   SNS44(2),SNS44-2    DID TRANS LINES GET RESET ?
  0C56 F2 01 48           304         JNE   ER44                JUMP IF NOT.
                          305
  0C59 C2 01 0CF8         306         LA    SNS4E,XR1           SET UP TO DO INDIRECT SENSE.
  0C5D F3 43 F8           307         SIO   X'F8',X'43'         DO A CONTROL 1 TO ACT. SELECT LINES.
  0C60 70 43 00           308         SNS   0(,XR1),X'43'       SENSE TRANS LINES FOR -F9F8-.
                          309
  0C63 0D 01 0CF8 0CF6    310         CLC   SNS4E(2),SNS4E-2    I/O SELECT LINES ACTIVATE ?
  0C69 F2 01 7D           311         JNE   ER4E                BRANCH IF NOT.
                          312
  0C6C 30 43 0CB3         313         SNS   SNS44,X'43'         SENSE I/O TRANS LINES FOR -F900-.
                          314
  0C70 0D 01 0CB3 0CB1    315         CLC   SNS44(2),SNS44-2    DID TRANS LINES GET RESET ?
  0C76 F2 01 28           316         JNE   ER44                JUMP IF NOT.
                          317
  0C79 C0 87 0216         318         B     LINK                RETURN TO DCP.
                          319
                          320 * ROUTINE 04 ERROR MESSAGES *
```



```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

                          321
  0C7D C0 87 021A         322 ER4A  B     PRINT               PRINT READ DRIVER CHECK.
  0C81 C2           0C81  323         DC    XL1'C2'
  0C82 12           0C82  324         DC    IL1'18'
  0C83 1A15         0C84  325         DC    AL2(RDRIV)
  0C85 4024         0C86  326         DC    XL2'4024'
                          327
  0C87 C0 87 155B         328         B     ERROR               DUMP I/O TRANSFER LINES.
  0C8B 03           0C8B  329         DC    XL1'03'
  0C8C FD00         0C8D  330         DC    XL2'FD00'           -EXPECTED.
  0C8E 0000         0C8F  331 SNS4A   DC    XL2'0000'           -ACTUAL.
  0C90 FF           0C90  332         DC    XL1'FF'
  0C91 C0 87 139C         333         B     MAPS                POINT TO MAP CHART.
  0C95 9231         0C96  334         DC    XL2'9231'           -PAGE 923, ENTRY 1.
  0C97 C0 87 0222         335         B     HALT                ERROR HALT -24-.
  0C9B 4024         0C9C  336         DC    XL2'4024'
  0C9D C0 87 0216         337         B     LINK                RETURN TO DCP.
                          338
  0CA1 C0 87 021A         339 ER44  B     PRINT               PRINT TRL'S NOT RESET.
  0CA5 C2           0CA5  340         DC    XL1'C2'
  0CA6 1D           0CA6  341         DC    IL1'29'
  0CA7 19D2         0CA8  342         DC    AL2(UNSET)
  0CA9 4027         0CAA  343         DC    XL2'4027'
                          344
  0CAB C0 87 155B         345         B     ERROR               DUMP TRANSFER LINES.
  0CAF 03           0CAF  346         DC    XL1'03'
  0CB0 F900         0CB1  347         DC    XL2'F900'           -EXPECTED.
  0CB2 0000         0CB3  348 SNS44   DC    XL2'0000'           -ACTUAL.
  0CB4 FF           0CB4  349         DC    XL1'FF'
  0CB5 C0 87 139C         350         B     MAPS                POINT TO MAP CHART.
  0CB9 9242         0CBA  351         DC    XL2'9242'           -PAGE 924, ENTRY 2.
  0CBB C0 87 0222         352         B     HALT                ERROR HALT -27-.
  0CBF 4027         0CC0  353         DC    XL2'4027'
  0CC1 C0 87 0216         354         B     LINK                RETURN TO DCP.
                          355
  0CC5 C0 87 021A         356 ER4C  B     PRINT               PRINT WRITE DRIVER CHECK.
  0CC9 C2           0CC9  357         DC    XL1'C2'
  0CCA 13           0CCA  358         DC    IL1'19'
  0CCB 1A03         0CCC  359         DC    AL2(WDRIV)
  0CCD 4025         0CCE  360         DC    XL2'4025'
                          361
  0CCF C0 87 1558         362         B     ERROR               DUMP TRANSFER LINES.
  0CD3 03           0CD3  363         DC    XL1'03'
  0CD4 FF00         0CD5  364         DC    XL2'FF00'           -EXPECTED.
  0CD6 0000         0CD7  365 SNS4C   DC    XL2'0000'           -ACTUAL.
  0CD8 FF           0CD8  366         DC    XL1'FF'
  0CD9 C0 87 139C         367         B     MAPS                POINT TO MAP CHART.
  0CDD 9232         0CDE  368         DC    XL2'9232'           -PAGE 923, ENTRY 2.
  0CDF C0 87 0222         369         B     HALT                ERROR HALT -25-.
  0CE3 4025         0CE4  370         DC    XL2'4025'
  0CE5 C0 87 0216         371         B     LINK                RETURN TO DCP.
                          372
  0CE9 C0 87 021A         373 ER4E  B     PRINT               PRINT I/O SELECT CHECK.
  0CED C2           0CED  374         DC    XL1'C2'
  0CEE 11           0CEE  375         DC    IL1'17'
  0CEF 1A26         0CF0  376         DC    AL2(IOSLT)
  0CF1 4026         0CF2  377         DC    XL2'4026'
                          378
  0CF3 C0 87 1558         379         B     ERROR               DUMP TRANSFER LINES.
  0CF7 03           0CF7  380         DC    XL1'03'
  0CF8 F9F8         0CF9  381         DC    XL2'F9F8'           -EXPECTED.
  0CFA 0000         0CFB  382 SNS4E   DC    XL2'0000'           -ACTUAL.
  0CFC FF           0CFC  383         DC    XL1'FF'
  0CFD C0 87 139C         384         B     MAPS                POINT TO MAP CHART.
  0D01 9241         0D02  385         DC    XL2'9241'           -PAGE 924, ENTRY 1.
  0D03 C0 87 0222         386         B     HALT                ERROR HALT -26-.
  0D07 4026         0D08  387         DC    XL2'4026'
  0D09 C0 87 0216         388         B     LINK                RETURN TO DCP.
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         389 *********
                         390 * RTN05 *
                         391 ***************************************************************************
                         392 *                                                                         *
                         393 *       ROUTINE C5        EOT SIGNAL IS GENERATED TO TEST I/O             *
                         394 *                         DISCONNECT.  THE FUNCTION REGISTER              *
                         395 *                         IS SET FOR 6 USEC RESET OF DISCONNECT.          *
                         396 *                                                                         *
                         397 ***************************************************************************
 0D0D 05           0D0D  398 RTN05  DC    XL1'05'           ROUTINE NUMBER
 0D0E 00           0D0E  399        DC    XL1'00'           NO MANUAL INTERVENTION REQUIRED
 0D0F 0DF1         0D10  400        DC    AL2(RTN06)        ROUTINE 06 ADDRESS
                         401
 0D11 C0 87 021A         402        B     PRINT             PRINT DISCONNECT TEST HEADING.
 0D15 45           0D15  403        DC    XL1'45'
 0D16 24           0D16  404        DC    IL1'36'
 0D17 19B5         0D18  405        DC    AL2(HD05)
 0D19 40A5         0D1A  406        DC    XL2'40A5'
                         407
 0D1B C0 87 131D         408        B     INITL             INITIALIZE THE 3741
                         409
 0D1F C0 87 13C3         410        B     QUES              TEST FOR SSW 10.
 0D23 F0 3C 3C           411        HPL   X'3C',X'3C'       HALT -FF- IF ON.
                         412
 0D26 F3 41 05           413        SIO   X'C5',X'41'       ISSUE READ CALL WITH RESET & ENABLE.
 0D29 F3 43 02           414        SIO   X'02',X'43'       DO CONTROL 1 TO GENERATE EOT.
 0D2C 30 45 0DDF         415        SNS   SNS5A,X'45'       SENSE DIAGNOSTIC BYTE FOR -0800-.
 0D30 30 42 0DDA         416        SNS   SNS5B,X'42'       SENSE STATUS/LCR FOR -E100-.
 0D34 30 43 0DDC         417        SNS   SNS5C,X'43'       SENSE I/O TRANS LINES FOR -F902-.
                         418
 0D38 3C 00 0DDF         419        MVI   SNS5A,X'00'       CLEAR THE DATA TRANS REG.
 0D3C 3C 00 0DDA         420        MVI   SNS5B,X'00'       CLEAR THE LENGTH COUNT REG.
                         421
 0D40 0D 01 0DDF 0DDD    422        CLC   SNS5A(2),SNS5A-2  DIAGNOSTIC BYTE AS EXPECTED ?
 0D46 F2 01 60           423        JNE   ER05              BRANCH IF NOT.
 0D49 0D 01 0DDA 0DD8    424        CLC   SNS5B(2),SNS5B-2  STATUS BYTE AS EXPECTED ?
 0D4F F2 01 57           425        JNE   ER05              BRANCH IF NOT.
 0D52 0D 01 0DDC 0DD3    426        CLC   SNS5C(2),SNS5C-2  I/O TRANSFER LINES AS EXPECTED ?
 0D58 F2 01 4E           427        JNE   ER05              BRANCH IF NOT.
                         428
 0D5B 31 41 16B8         429        LIO   H0082,X'41'       SET FNCT REG TO DIAG MODE. 6USEC RST
 0D5F F3 40 0D           430        SIO   X'0D',X'40'       DO GENERAL 3741 RESET.
 0D62 30 42 0D97         431        SNS   SNS5E,X'42'       SENSE STATUS FOR -8100-.
 0D66 30 45 0D92         432        SNS   SNS5D,X'45'       SENSE DIAGNOSTIC BYTE FOR -0000-.
                         433
 0D6A 0D 01 0D92 0D90    434        CLC   SNS5D(2),SNS5D-2  DIAGNOSTIC BYTE AS EXPECTED ?
 0D70 F2 01 0D           435        JNE   ER05A             BRANCH IF NOT.
 0D73 0D 01 0D97 0D95    436        CLC   SNS5E(2),SNS5E-2  STATUS BYTE AS EXPECTED ?
 0D79 F2 01 04           437        JNE   ER05A             BRANCH IF NOT.
                         438
 0D7C C0 87 0216         439        B     LINK              RETURN TO DCP.
                         440
                         441 * ROUTINE 05 ERROR MESSAGE *
                         442
 0D80 C0 87 021A         443 ER05A  B     PRINT             PRINT SENSE RESET CHECK.
 0D84 C2           0D84  444        DC    XL1'C2'
 0D85 12           0D85  445        DC    IL1'18'
 0D86 1AE2         0D87  446        DC    AL2(IODIS)
 0D88 4029         0D89  447        DC    XL2'4029'
                         448
 0D8A C0 87 155B         449        B     ERROR             DUMP THESE REGISTER-
 0D8E 05           0D8E  450        DC    XL1'05'           DIAGNOSTIC BYTE/DATA TRANS REG.
 0D8F 0000         0D90  451        DC    XL2'0000'         -EXPECTED.
 0D91 0000         0D92  452 SNS5D  DC    XL2'0000'         -ACTUAL.
 0D93 02           0D93  453        DC    XL1'02'           STATUS BYTE/LENGTH COUNT REGISTER.
 0D94 8100         0D95  454        DC    XL2'8100'         -EXPECTED.
 0D96 0000         0D97  455 SNS5E  DC    XL2'0000'         -ACTUAL.
 0D98 FF           0D98  456        DC    XL1'FF'
```


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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0D99 C0 87 139C         457        B     MAP5              POINT TO MAP CHART.
 0D9D 9272         0D9E  458        DC    XL2'9272'         -PAGE 927. ENTRY 2.
 0D9F C0 87 0222         459        B     HALT              ERROR HALT -29-.
 0DA3 4029         0DA4  460        DC    XL2'4029'
 0DA5 C0 87 0216         461        B     LINK              RETURN TO DCP.
                         462
 0DA9 0C 01 1649 0DDF    463 ER05   MVC   TEST-4(2),SNS5A   STORE DIAG BYTE/DATA TRANS REG.
 0DAF 0C 01 164B 0DDA    464        MVC   TEST-2(2),SNS5B   STORE STATUS BYTE/LENGTH COUNT REG.
 0DB5 0C C1 164D 0DDC    465        MVC   TEST(2),SNS5C     STORE I/O TRANSFER LINES.
                         466
 0DBB C0 87 021A         467        B     PRINT             PRINT EOT CHECK.
 0DBF C2           0DBF  468        DC    XL1'C2'
 0DC0 13           0DC0  469        DC    IL1'19'
 0DC1 1830         0DC2  470        DC    AL2(EOT)
 0DC3 4028         0DC4  471        DC    XL2'4028'
                         472
 0DC5 C0 87 13ED         473        B     CKPAT             CHECK TO SEE IF DATA MATCHES PATTERN
 0DC9 1656         0DCA  474        DC    AL2(EXPY)         -TABLE ADDRESS OF PATTERNS.
 0DCB 1687         0DCC  475        DC    AL2(ERMS05)       -TABLE ADDRESS OF MESSAGES.
                         476
 0DCD C0 87 155B         477        B     ERROR             DUMP THESE REGISTERS-
 0DD1 03           0DD1  478        DC    XL1'03'           I/O TRANSFER LINES.
 0DD2 F902         0DD3  479        DC    XL2'F902'         -EXPECTED.
 0DD4 0000         0DD5  480 SNS5C  DC    XL2'0000'         -ACTUAL.
 0DD6 02           0DD6  481        DC    XL1'02'           STATUS BYTE/LENGTH COUNT REG.
 0DD7 E100         0DD8  482        DC    XL2'E100'         -EXPECTED.
 0DD9 0000         0DDA  483 SNS5B  DC    XL2'0000'         -ACTUAL.
 0DDB 05           0DDB  484        DC    XL1'05'           DIAGNOTSTIC BYTE/DATA TRANS REG.
 0DDC 0800         0DDD  485        DC    XL2'0800'         -EXPECTED.
 0DDE 0000         0DDF  486 SNS5A  DC    XL2'0000'         -ACTUAL.
 0DE0 FF           0DE0  487        DC    XL1'FF'
 0DE1 C0 87 139C         488        B     MAP5              POINT TO MAP CHART.
 0DE5 9271         0DE6  489        DC    XL2'9271'         -PAGE 927. ENTRY 1.
 0DE7 C0 87 0222         490        B     HALT              ERROR HALT -28-.
 0DEB 4028         0DEC  491        DC    XL2'4028'
 0DED C0 87 0216         492        B     LINK              RETURN TO DCP.
                         493
                         494
                         495 *********
                         496 * RTN06 *
                         497 ***************************************************************************
                         498 *                                                                         *
                         499 *       ROUTINE C6        GENERATE EOT USING I/O 3 SELECT                 *
                         500 *                         WITH A SIO READ CALL.                           *
                         501 *                                                                         *
                         502 ***************************************************************************
 0DF1 06           0DF1  503 RTN06  DC    XL1'06'           ROUTINE NUMBER
 0DF2 00           0DF2  504        DC    XL1'00'           NO MANUAL INTERVENTION REQUIRED
 0DF3 0E4A         0DF4  505        DC    AL2(RTN07)        ROUTINE 07 ADDRESS
                         506
 0DF5 C0 87 021A         507        B     PRINT             PRINT EOT HEADING.
 0DF9 45           0DF9  508        DC    XL1'45'
 0DFA 31           0DFA  509        DC    IL1'49'
 0DFB 181D         0DFC  510        DC    AL2(HD06)
 0DFD 40A6         0DFE  511        DC    XL2'40A6'
                         512
 0DFF C0 87 131D         513        B     INITL             INITIALIZE THE 3741
                         514
 0E03 C0 87 13C3         515        B     QUES              TEST FOR SSW 10.
 0E07 F0 3C 3C           516        HPL   X'3C',X'3C'       HALT -FF- IF ON.
                         517
 0E0A F3 41 05           518        SIO   X'C5',X'41'       ISSUE A SIO READ CALL.
 0E0D F3 43 04           519        SIO   X'04',X'43'       ISSUE A CONTROL 1 - I/O SELECT 3.
 0E10 30 45 0E38         520        SNS   SNS6,X'45'        SENSE DIAG-DTR FOR A -0800-.
 0E14 31 41 16B8         521        LIO   H0082,X'41'       DO 6 USEC RESET WITH FNCT REG.
 0E18 3C 00 0E38         522        MVI   SNS6,X'00'        CLEAR DATA TRANS REGISTER.
                         523
 0E1C 0D 01 0E38 0E36    524        CLC   SNS6(2),SNS6-2    DIAGNOSTIC BYTE AS EXPECTED ?
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E22 C0 81 0216              525         BE    LINK              RETURN TO DCP IF OK.
                                526
                                527 * ROUTINE 06 ERROR MESSAGE *
                                528
   0E26 C0 87 021A              529         B     PRINT             PRINT EOT CHECK.
   0E2A C2              0E2A    530         DC    XL1'C2'
   0E2B 0A              0E2B    531         DC    IL1'10'
   0E2C 1AEC            0E2D    532         DC    AL2(EOTACT)
   0E2E 402A            0E2F    533         DC    XL2'402A'
                                534
   0E30 C0 87 155B              535         B     ERROR             DUMP DIAGNOSTIC/DATA TRANS REG.
   0E34 05              0E34    536         DC    XL1'05'
   0E35 0800            0E36    537         DC    XL2'0800'         -EXPECTED.
   0E37 0000            0E38    538 SNS6    DC    XL2'0000'         -ACTUAL.
   0E39 FF              0E39    539         DC    XL1'FF'
   0E3A C0 87 139C              540         B     MAPS              POINT TO MAP CHART.
   0E3E 9311            0E3F    541         DC    XL2'9311'         -PAGE 931. ENTRY 1.
   0E40 C0 87 0222              542         B     HALT              ERROR HALT -2A-.
   0E44 402A            0E45    543         DC    XL2'402A'
   0E46 C0 87 0216              544         B     LINK              RETURN TO DCP.
                                545
                                546
                                547 *********
                                548 * RTN07 *
                                549 ************************************************************************
                                550 *                                                                      *
   0E4A 07              0E4A    551 *       ROUTINE C7        I/O TRANSFER LINES 1 & 3 ARE                 *
   0E4B 00              0E4B    552 *                         CHECKED FOR RESETTING.                       *
   0E4C 0EDD            0E4D    553 *                                                                      *
                                554 ************************************************************************
   0E4A 07              0E4A    555 RTN07   DC    XL1'07'           ROUTINE NUMBER
   0E4B 00              0E4B    556         DC    XL1'00'           NO MANUAL INTERVENTION REQUIRED
   0E4C 0EDD            0E4D    557         DC    AL2(RTN08)        ROUTINE 08 ADDRESS
                                558
   0E4E C0 87 021A              559         B     PRINT             PRINT TRL'S 1, 3 RESET TEST.
   0E52 45              0E52    560         DC    XL1'45'
   0E53 29              0E53    561         DC    IL1'41'
   0E54 1A83            0E55    562         DC    AL2(HD07)
   0E56 40A7            0E57    563         DC    XL2'40A7'
                                564
   0E58 C0 87 131D              565         B     INITL             INITIALIZE THE 3741
                                566
   0E5C C0 87 13C3              567         B     QUES              TEST FOR SSW 10.
   0E60 F0 3C 3C                568         HPL   X'3C',X'3C'       HALT -FF- IF ON.
                                569
   0F63 31 41 16BD              570         LIO   H0188,X'41'       SET FNCT REG TO LATCH TRL 1,3.
   0E67 31 45 1698              571         LIO   H0001,X'45'       LOAD DATA TRANS REG WITH -01-.
   0E6B 31 45 1699              572         LIO   H0000,X'45'       CLEAR DATA TRANS REG.
   0E6F F3 43 10                573         SIO   X'10',X'43'       ISSUE CONTROL 1 START I/O.
   0E72 30 43 0EC8              574         SNS   SNS77,X'43'       DO ONE DUMMY SENSE TO STALL.
   0E76 30 43 0EC8              575         SNS   SNS77,X'43'       SENSE TRANS LINES FOR -F900-.
                                576
   0E7A 0D 01 0EC8 0EC9         577         CLC   SNS77(2),SNS77-2  DID TRANS LINE 1 RESET ?
   0E80 F2 01 23                578         JNE   ER7A              BRANCH IF NOT.
                                579
   0E83 31 45 16A1              580         LIO   H0004,X'45'       LOAD DATA TRANS REG WITH -04-.
   0E87 31 45 1699              581         LIO   H0000,X'45'       CLEAR DATA TRANS REG.
   0E8B F3 43 10                582         SIO   X'10',X'43'       ISSUE SIO CONTROL 1 TO RESET TRL 3.
   0E8E 30 43 0EC8              583         SNS   SNS77,X'43'       DO DUMMY SENSE TO STALL.
   0E92 30 43 0EC8              584         SNS   SNS77,X'43'       SENSE TRANS LINES FOR -F900-.
                                585
   0E96 0D 01 0EC8 0EC9         586         CLC   SNS77(2),SNS77-2  DID TRANS LINE 3 RESET ?
   0E9C F2 01 12                587         JNE   ER7B              BRANCH IF NOT.
                                588
   0E9F F3 40 0D                589         SIO   X'0D',X'40'       DO GENERAL 3741 RESET.
                                590
   0EA2 C0 87 0216              591         B     LINK              RETURN TO DCP.
                                592
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                593 * ROUTINE 07 ERROR MESSAGES *
                                594
   0EA6 3C F1 1A96              595 ER7A    MVI   ONCTS-13,X'F1'     SET UP FOR TRL 1 RESET CHECK.
   0EAA 3B 01 0ED2              596         SBF   MP07,X'01'        SET FOR ENTRY 2 MAP REFERENCE.
   0EAE F2 87 C8                597         J     *+11
   0EB1 3C F3 1A96              598 ER7B    MVI   ONCTS-13,X'F3'    SET UP FOR TRL 3 RESET CHECK.
   0EB5 3A 01 0ED2              599         SBN   MP07,X'01'        SET FOR ENTRY 3 MAP REFERENCE.
   0EB9 C0 87 021A              600         B     PRINT             PRINT TRL 1/3 RESET CHECK.
   0EBD C2              0EBD    601         DC    XL1'C2'
   0EBE 20              0EBE    602         DC    IL1'32'
   0EBF 1AA3            0EC0    603         DC    AL2(ONCTS)
   0EC1 402E            0EC2    604         DC    XL2'402E'         (SAME ID AS RTN08)
                                605
   0EC3 C0 87 155B              606         B     ERROR             DUMP TRANS LINES.
   0EC7 03              0EC7    607         DC    XL1'03'
   0EC8 F900            0EC9    608         DC    XL2'F900'         -EXPECTED.
   0ECA 0000            0ECB    609 SNS77   DC    XL2'0000'         -ACTUAL.
   0ECC FF              0ECC    610         DC    XL1'FF'
   0ECD C0 87 139C              611         B     MAPS              POINT TO MAP CHART.
   0ED1 9312            0ED2    612 MP07    DC    XL2'9312'         -PAGE 931. ENTRY 2/3.
   0ED3 C0 87 0222              613         B     HALT              ERROR HALT -2E-.
   0ED7 402E            0ED8    614         DC    XL2'402E'
   0ED9 C0 87 0216              615         B     LINK              RETURN TO DCP.
                                616
                                617
                                618 *********
                                619 * RTN08 *
                                620 ************************************************************************
                                621 *                                                                      *
   0EDD 08              0EDD    622 *       ROUTINE C8        I/O TRANSFER LINES 4, 6 & 7 ARE              *
   0EDE 00              0EDE    623 *                         CHECKED FOR RESETTING.                       *
   0EDF 0F9F            0EE0    624 *                                                                      *
                                625 ************************************************************************
   0EDD 08              0EDD    626 RTN08   DC    XL1'08'           ROUTINE NUMBER
   0EDE 00              0EDE    627         DC    XL1'00'           NO MANUAL INTERVENTION REQUIRED
   0EDF 0F9F            0EE0    628         DC    AL2(RTN09)        ROUTINE 09 ADDRESS
                                629
   0EE1 C0 87 021A              630         B     PRINT             PRINT LATCH RESET OF TRL 4,6,7.
   0EE5 45              0EE5    631         DC    XL1'45'
   0EE6 2D              0EE6    632         DC    IL1'45'
   0EE7 1AD0            0EE8    633         DC    AL2(HD08)
   0EE9 40A8            0EEA    634         DC    XL2'40A8'
                                635
   0EEB C0 87 131D              636         B     INITL             INITIALIZE THE 3741
                                637
   0EEF C0 87 13C3              638         B     QUES              TEST FOR SSW 10.
   0EF3 F0 3C 3C                639         HPL   X'3C',X'3C'       HALT -FF- IF ON.
                                640
   0EF6 31 41 16BD              641         LIO   H0188,X'41'       SET FNCT REG TO LATCH TRL 1,2,3.
   0EFA F3 43 10                642         SIO   X'10',X'43'       ISSUE SIO CONTROL 1 TO CLEAR LOGIC.
   0EFD 30 43 0F8D              643         SNS   SNS88,X'43'       STALL BEFORE DOING THE NEXT SIO.
   0F01 F3 43 08                644         SIO   X'C8',X'43'       DO CONTROL 1 TO LATCH TRL 4.
   0F04 30 43 0F8D              645         SNS   SNS88,X'43'       STALL BEFORE DOING NEXT SIO.
   0F08 F3 43 10                646         SIO   X'10',X'43'       DO SIO CONTROL 1 TO RESET TRL'S.
   0F0B 30 43 0F8D              647         SNS   SNS88,X'43'       DO DUMMY SENSE TO STALL.
   0F0F 30 43 0F8D              648         SNS   SNS88,X'43'       SENSE TRANS LINES FOR -F900-.
                                649
   0F13 0D 01 0F8D 0F88         650         CLC   SNS88(2),SNS88-2  DID TRANS LINE 4 GET RESET ?
   0F19 F2 01 3D                651         JNE   ER88              BRANCH IF NOT.
                                652
   0F1C F3 43 20                653         SIO   X'20',X'43'       ISSUE CONTROL 1 TO LATCH TRL 6.
   0F1F 30 43 0F8D              654         SNS   SNS88,X'43'       STALL BEFORE DOING NEXT SIO.
   0F23 F3 43 10                655         SIO   X'10',X'43'       DO SIO CONTROL 1 TO RESET TRL'S.
   0F26 30 43 0F8D              656         SNS   SNS88,X'43'       DO DUMMY SENSE TO STALL.
   0F2A 30 43 0F8D              657         SNS   SNS88,X'43'       SENSE TRANS LINES FOR -F900-.
                                658
   0F2E 0D 01 0F8D 0F88         659         CLC   SNS88(2),SNS88-2  DID TRANS LINES GET RESET ?
   0F34 F2 01 31                660         JNE   ER8C              BRANCH IF NOT.
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                           661
                           662          SIO   X'40',X'43'          DO CONTROL 1 TO LATCH TRL 7.
                           663          SNS   SNS88,X'43'          STALL BEFORE DOING NEXT SIO.
 0F37 F3 43 40             664          SIO   X'10',X'43'          DO SIO CONTROL 1 TO RESET TRL'S.
 0F3A 30 43 0F8D           665          SNS   SNS88,X'43'          DO DUMMY SENSE TO STALL.
 0F3E F3 43 10             666          SNS   SNS88,X'43'          SENSE TRANS LINES FOR -F900-.
 0F41 30 43 0F8D           667
 0F45 30 43 0F8D           668          CLC   SNS88(2),SNS88-2     DID TRANS LINE 7 GET RESET ?
                           669          JNE   ER8F                 BRANCH IF NOT.
 0F49 0D 01 0F8D 0F8B      670
 0F4F F2 01 21             671          SIO   X'0D',X'40'          DO GENERAL 3741 RESET.
                           672          B     LINK                 RETURN TO DCP.
 0F52 F3 40 0D             673
 0F55 C0 87 0216           674 * ROUTINE 08 ERROR MESSAGES *
                           675
                           676 ER8B     MVI   SNS88-1,X'0A'        SET UP EXPECTED TRANS LINES.
 0F59 3C 0A 0F8C           677          MVI   ONCTS-13,X'F4'       SET UP TRL 4 CHECK.
 0F5D 3C F4 1A96           678          MVI   MP08,X'14'           SET FOR MAP 4 ENTRY REFERENCE.
 0F61 3C 14 0F94           679          J     PRT88                GO PRINT ERROR.
 0F65 F2 87 13             680
                           681 ER8D     MVI   ONCTS-13,X'F6'       SET UP TRL 6 CHECK.
 0F68 3C F6 1A96           682          MVI   MP08,X'15'           SET FOR MAP 5 ENTRY REFERENCE.
 0F6C 3C 15 0F94           683          J     PRT88                PRINT CHECK MESSAGE.
 0F70 F2 87 08             684
                           685 ER8F     MVI   ONCTS-13,X'F7'       SET UP TRL 7 CHECK.
 0F73 3C F7 1A96           686          MVI   MP08,X'16'           SET FOR MAP 6 ENTRY REFERENCE.
 0F77 3C 16 0F94           687
                           688 PRT88    B     PRINT                PRINT TRANS LINES DID NOT RESET.
 0F7B C0 87 021A           689          DC    XL1'C2'
 0F7F C2             0F7F  690          DC    IL1'32'
 0F80 20             0F80  691          DC    AL2(DNOTS)
 0F81 1AA3           0F82  692          DC    XL2'402E'
 0F83 402E                  693          B     ERROR                DUMP TRANSFER LINES.
 0F85 C0 87 155B           694          DC    XL1'03'
 0F89 03             0F89  695          DC    XL2'F900'            -EXPECTED.
 0F8A F900           0F8B  696 SNS88    DC    XL2'0000'            -ACTUAL.
 0F8C 0000           0F8D  697          DC    XL1'FF'
 0F8E FF                    698          B     MAFS                 POINT TO MAP CHART.
 0F8F C0 87 139C           699 MP08     DC    XL2'9300'            -PAGE 931. ENTRY 4,5,OR 6.
 0F93 9300                  700          B     HALT                 ERROR HALT -2E-.
 0F95 C0 87 0222           701          DC    XL2'402E'
 0F99 402E                  702          B     LINK                 RETURN TO DCP.
 0F9B C0 87 0216           703
                           704
                           705 *********
                           706 * RTN09 *
                           707 ************************************************************************
                           708 *                                                                      *
                           709 *       ROUTINE C9          TEST ABILITY OF READ & WRITE CALL          *
                           710 *                           TO RESET TRANSFER LINES 3 & 4.             *
                           711 *                                                                      *
                           712 ************************************************************************
 0F9F 09             0F9F  713 RTN09    DC    XL1'09'              ROUTINE NUMBER
 0FA0 00             0FA0  714          DC    XL1'00'              NO MANUAL INTERVENTION REQUIRED
 0FA1 1063           0FA2  715          DC    AL2(RTN0A)           ROUTINE 0A ADDRESS
                           716
 0FA3 C0 87 021A           717          B     PRINT                PRINT RESET TEST HEADING.
 0FA7 45             0FA7  718          DC    XL1'45'
 0FA8 38             0FA8  719          DC    IL1'56'
 0FA9 1B68           0FAA  720          DC    AL2(MD09)
 0FAB 40A9           0FAC  721          DC    XL2'40A9'
                           722
 0FAD C0 87 131D           723          B     INITL                INITIALIZE THE 3741
                           724
 0FB1 C0 87 13C3           725          B     QUES                 TEST FOR SSW 10.
 0FB5 F0 3C 3C             726          HPL   X'3C',X'3C'          HALT -FF- IF ON.
                           727
 0FB8 31 41 16BF           728          LIO   H06B2,X'41'          SET FNCT REG FOR EVEN PARITY ETC.
```



```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

 0FBC 31 45 16C1           729          LIO   H00FF,X'45'          LOAD DATA TRANS REG WITH -FF-.
 0FC0 31 45 1699           730          LIO   H0000,X'45'          CLEAR DATA TRANS REGISTER.
 0FC4 30 43 100D           731          SNS   SNS9A,X'43'          SENSE I/O TRANSFER LINES FOR -F80C-.
                           732
 0FC8 0D 01 100D 100C      733          CLC   SNS9A(2),SNS9A-2     TRANSFER LINES AS EXPECTED ?
 0FCE F2 01 2A             734          JNE   ER09A                BRANCH IF NOT.
                           735
 0FD1 F3 41 00             736          SIO   X'00',X'41'          ISSUE READ CALL TO RESET TRL 4.
 0FD4 30 43 1051           737          SNS   SNS99,X'43'          SENSE TRANS LINES FOR -FC04-.
                           738
 0FD8 0D 01 1051 16C9      739          CLC   SNS99(2),HFC04       TRANSFER LINES AS EXPECTED ?
 0FDE F2 01 3E             740          JNE   ER09B                BRANCH IF NOT.
                           741
 0FE1 F3 40 08             742          SIO   X'08',X'40'          DO SIO RESET TO 3741
                           743
 0FE4 F3 42 00             744          SIO   X'0C',X'42'          ISSUE WRITE CALL TO RESET TRL 3.
 0FE7 30 43 1051           745          SNS   SNS99,X'43'          SENSE TRANS LINES FOR -FE00-.
                           746
 0FEB 0D 01 1051 16CB      747          CLC   SNS99(2),HFE00       TRANSFER LINES AS EXPECTED ?
 0FF1 F2 01 3D             748          JNE   ER09C                BRANCH IF NOT.
                           749
 0FF4 F3 40 0D             750          SIO   X'0D',X'40'          DO GENERAL 3741 RESET.
 0FF7 C0 87 0216           751          B     LINK                 RETURN TO DCP.
                           752
                           753 * ROUTINE 09 ERROR MESSAGES *
                           754
 0FFB C0 87 021A           755 ER09A    B     PRINT                PRINT INITIALIZATION CHECK.
 0FFF C2             0FFF  756          DC    XL1'C2'
 1000 12             1000  757          DC    IL1'18'
 1001 1A38           1002  758          DC    AL2(DISCK)
 1003 402F           1004  759          DC    XL2'402F'
                           760
 1005 C0 37 155B           761          B     ERROR                DUMP TRANS LINES.
 1009 03             1009  762          DC    XL1'03'
 100A F80C           100B  763          DC    XL2'F80C'            -EXPECTED.
 100C 0000           100D  764 SNS9A    DC    XL2'0000'            -ACTUAL.
 100E FF             100E  765          DC    XL1'FF'
 100F C0 87 139C           766          B     MAFS                 POINT TO MAP CHART.
 1013 9331           1014  767          DC    XL2'9331'            -PAGE 933. ENTRY 1.
 1015 C0 87 0222           768          B     HALT                 ERROR HALT -2F-.
 1019 402F           101A  769          DC    XL2'402F'
 101B C0 87 0216           770          B     LINK                 RETURN TO DCP.
                           771
                           772 ER09B    MVC   SNS99-1(2),HFC04     SET UP FOR READ CHECK.
 101F 0C 01 1050 16C9      773          MVI   ONCTS-13,X'F4'       SET MAP ENTRY 2 REFERENCE.
 1025 3C F4 1A96           774          SBF   MPC9,X'01'
 1029 3B 01 1058           775          B     **18
 102D C0 87 103F           776 ER09C    MVC   SNS99-1(2),HFE00     SET UP FOR WRITE CHECK.
 1031 0C 01 1050 16CB      777          MVI   ONCTS-13,X'F3'       SET MAP ENTRY 3 REFERENCE.
 1037 3C F3 1A96           778          SBN   MPC9,X'01'
 103B 3A 01 1058           779
                           780          B     PRINT                PRINT TRANS LINE X CHECK.
 103F C0 87 021A           781          DC    XL1'C2'
 1043 C2             1043  782          DC    IL1'32'
 1044 20             1044  783          DC    AL2(DNOTS)
 1045 1AA3           1046  784          DC    XL2'4030'
 1047 4030           1048  785
                           786          B     ERROR                DUMP TRANS LINES.
 1049 C0 87 155B           787          DC    XL1'03'
 104D 03             104D  788          DC    XL2'0000'            -EXPECTED.
 104E 0000           104F  789 SNS99    DC    XL2'0000'            -ACTUAL.
 1050 0000           1051  790          DC    XL1'FF'
 1052 FF                   791          B     MAFS                 POINT TO MAP CHART.
 1053 C0 87 139C           792 MP09     DC    XL2'9332'            -PAGE 933. ENTRY 2/3.
 1057 9332                 793          B     HALT                 ERROR HALT -30-.
 1059 C0 87 0222           794          DC    XL2'4030'
 105D 4030           105E  795          B     LINK                 RETURN TO DCP.
 105F C0 87 0216
```

4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                          797 *********
                          798 * RTN0A *
                          799 ********************************************************************************
                          800 *                                                                              *
                          801 *      ROUTINE CA          TEST RESET OF I/O DISCONENCT LATCH                  *
                          802 *                          WITH I/O TRANSFER LINES 3, 5.                       *
                          803 *                                                                              *
                          804 ********************************************************************************
  1063 0A            1063 805 RTN0A  DC    XL1'0A'             ROUTINE NUMBER
  1064 00            1064 806        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
  1065 1115          1066 807        DC    AL2(RTN0E)          ROUTINE 0B ADDRESS
                          808
  1067 C0 87 021A         809        B     PRINT               PRINT DISCONNECT HEADING.
  106B 45            106B 810        DC    XL1'45'
  106C 49            106C 811        DC    IL1'73'
  106D 1BB1          106E 812        DC    AL2(HD0A)
  106F 40AA          1070 813        DC    XL2'40AA'
                          814
  1071 C0 87 131D         815        B     INITL               INITIALIZE THE 3741
                          816
  1075 31 41 1699         817        LIO   H0000,X'41'         REMOVE 3741 FROM DIAGNOSTIC MODE.
  1079 F3 41 00           818        SIO   X'00',X'41'         ISSUE A READ CALL TO CAUSE BUSY.
  107C C1 42 109A         819        TIO   SHDBSY,X'42'        BRANCH ON BUSY.
                          820
  1080 C0 87 021A         821 DAMBSY B     PRINT               PRINT 3741 BUSY CHECK.
  1084 C2            1084 822        DC    XL1'C2'
  1085 10            1085 823        DC    IL1'16'
  1086 186F          1087 824        DC    AL2(BSY)
  1088 4035          1089 825        DC    XL2'4035'
  108A C0 87 139C         826        B     MAFS                POINT TO MAP CHART.
  108E 9355          108F 827        DC    XL2'9355'           -PAGE 935, ENTRY 5.
  1090 C0 87 0222         828        B     HALT                ERROR HALT -35-.
  1094 4035          1095 829        DC    XL2'4035'
  1096 C0 87 0216         830        B     LINK                RETURN TO DCP.
                          831
  109A F3 40 0D           832 SHDBSY SIO   X'0D',X'40'         DO SIO RESET TO CLEAR THE BUSY.
  109D C1 42 1080         833        TIC   DAMBSY,X'42'        BRANCH OUT IF STILL BUSY.
                          834
  10A1 C0 87 131D         835        B     INITL               GO INITIALIZE THE 3741
                          836
  10A5 C0 87 13C3         837        B     QUES                TEST FOR SSW 10.
  10A9 F0 3C 3C           838        HPL   X'3C',X'3C'         HALT -FF- IF ON.
                          839
  10AC 31 41 16CD         840        LIO   H0685,X'41'         SET FNCT FOR EVEN PARITY. 6 USEC RST
  10B0 31 45 1699         841        LIO   H0000,X'45'         CLEAR DATA TRANS REGISTER.
  10B4 F3 41 00           842        SIO   X'C0',X'41'         ISSUE A READ CALL.
  10B7 F3 43 04           843        SIO   X'04',X'43'         ISSUE START I/O CONTROL 1.
  10BA 31 45 16A1         844        LIO   H0004,X'45'         LOAD DATA TRANS REG WITH -04-.
  10BE 31 45 1699         845        LIO   H0000,X'45'         CLEAR DATA TRANSFER REGISTER.
  10C2 30 43 1103         846        SNS   SNSAA,X'43'         SENSE TRANS LINES FOR -F800-.
                          847
  10C6 0D 01 1103 1101    848        CLC   SNSAA(2),SNSAA-2    TRANS LINES AS EXPECTED ?
  10CC F2 01 22           849        JNE   ER0A               BRANCH IF NOT.
                          850
  10CF F3 41 00           851        SIO   X'C0',X'41'         ISSUE A READ CALL.
  10D2 F3 43 04           852        SIO   X'04',X'43'         DO START I/O CONTROL 1.
  10D5 31 45 16C3         853        LIO   H0010,X'45'         LOAD DATA TRANS REG WITH -10-.
  10D9 31 45 1699         854        LIO   H0C00,X'45'         CLEAR DATA TRANS REGISTER.
  10DD 30 43 1103         855        SNS   SNSAA,X'43'         SENSE TRANS LINES FOR -F800-.
                          856
  10E1 0D 01 1103 1101    857        CLC   SNSAA(2),SNSAA-2    TRANS LINES AS EXPECTED ?
  10E7 F2 01 07           858        JNE   ER0A               BRANCH IF NOT.
                          859
  10EA F3 40 0D           860        SIO   X'0D',X'40'         DO GENERAL 3741 RESET.
  10ED C0 87 0216         861        B     LINK                RETURN TO DCP.
                          862
                          863 * ROUTINE 0A ERROR MESSAGE *
                          864
```


4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
  10F1 C0 87 021A         865 ER0A   B     PRINT               PRINT DISCONNECT CHECK.
  10F5 C2            10F5 866        DC    XL1'C2'
  10F6 24            10F6 867        DC    IL1'36'
  10F7 1D0D          10F8 868        DC    AL2(PSDIS)
  10F9 4031          10FA 869        DC    XL2'4031'
                          870
  10FB C0 87 155B         871        B     ERROR               DUMP TRANSFER LINES.
  10FF 03            10FF 872        DC    XL1'03'
  1100 F800          1101 873        DC    XL2'F800'           -EXPECTED.
  1102 0000          1103 874 SNSAA  DC    XL2'0000'           -ACTUAL.
  1104 FF            1104 875        DC    XL1'FF'
  1105 C0 87 139C         876        B     MAFS                POINT TO MAP CHART.
  1109 9351          110A 877        DC    XL2'9351'           -PAGE 935, ENTRY 1.
  110B C0 87 0222         878        B     HALT                ERROR HALT -31-.
  110F 4031          1110 879        DC    XL2'4031'
  1111 C0 87 0216         880        B     LINK                RETURN TO DCP.
                          881
                          882 *********
                          883 * RTN0B *
                          884 ********************************************************************************
                          885 *                                                                              *
                          886 *      ROUTINE 0B          USE I/O TRANSFER LINES 1 & 2 TO                     *
                          887 *                          CAUSE END OF TRANSFER (EOT).                        *
                          888 *                                                                              *
                          889 ********************************************************************************
  1115 0B            1115 890 RTN0B  DC    XL1'0B'             ROUTINE NUMBER
  1116 00            1116 891        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
  1117 119D          1118 892        DC    AL2(RTN0C)          ROUTINE 0C ADDRESS.
                          893
  1119 C0 87 021A         894        B     PRINT               PRINT EOT HEADING.
  111D 45            111D 895        DC    XL1'45'
  111E 41            111E 896        DC    IL1'65'
  111F 16F2          1120 897        DC    AL2(HD0B)
  1121 40AB          1122 898        DC    XL2'40AB'
                          899
  1123 C0 87 131D         900        B     INITL               INITIALIZE THE 3741
                          901
  1127 C0 87 13C3         902        B     QUES                TEST FOR SSW 10.
  1128 F0 3C 3C           903        HPL   X'3C',X'3C'         HALT -FF- IF ON.
                          904
  112B 31 41 16C5         905        LIO   H3C82,X'41'         SET FNCT REG FOR 6 USEC RESET.
  1132 31 41 16C7         906        LIO   H3C80,X'41'         RELOAD THE FUNCTION REGISTER.
  1136 F3 42 01           907        SIO   X'01',X'42'         ISSUE A WRITE CALL.
  1139 31 45 169D         908        LIO   H0C02,X'45'         LOAD DATA TRANS REG WITH -02-.
  113D 31 45 1699         909        LIO   H0C00,X'45'         CLEAR DATA TRANS REGISTER.
  1141 30 45 118B         910        SNS   SNSBB,X'45'         SENSE DIAGNOSTIC/DATA TRANS -0800-.
                          911
  1145 0D 01 118B 1189    912        CLC   SNSBB(2),SNSBB-2    DIAGNOSTIC/DATA TRANS AS EXPECTED ?
  114B F2 01 2B           913        JNE   ER0B               BRANCH IF NOT.
                          914
  114E 31 41 16C5         915        LIO   H3C82,X'41'         LOAD FUNCTION REG FOR 6 USEC RESET.
  1152 31 41 16C7         916        LIO   H3C80,X'41'         RELOAD FUNCTION REGISTER.
  1156 F3 41 01           917        SIO   X'01',X'41'         ISSUE READ CALL.
  1159 31 45 1698         918        LIO   H0001,X'45'         LOAD DATA TRANS REG WITH -01-.
  115D 31 45 1699         919        LIO   H0C00,X'45'         CLEAR DATA TRANS REGISTER.
  1161 30 45 118B         920        SNS   SNSBB,X'45'         SENSE DIAG/DATA TRANS FOR -0800-.
                          921
  1165 0D 01 118B 1189    922        CLC   SNSBB(2),SNSBB-2    DIAGNOSTIC/DATA TRANS AS EXPECTED ?
  116B F2 01 0B           923        JNE   ER0B               BRANCH IF NOT.
                          924
  116E 31 41 16BB         925        LIO   H0C82,X'41'         SET FUNCTION REG FOR 6 USEC RESET.
  1172 F3 40 0D           926        SIO   X'0D',X'40'         DO GENERAL 3741 RESET.
  1175 C0 87 0216         927        B     LINK                RETURN TO DCP.
                          928
                          929 * ROUTINE 0B ERROR MESSAGE *
                          930
  1179 C0 87 021A         931 ER0B   B     PRINT               PRINT EOT CHECK.
  117D C2            117D 932        DC    XL1'C2'
```

4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    117E 13              117E  933        DC    IL1'19'
    117F 1830            1180  934        DC    AL2(EOT)
    1181 4032            1182  935        DC    XL2'4032'
                               936
    1183 C0 87 1558            937        B     ERROR              DUMP DIAGNOSTIC/DATA TRANS REGISTER.
    1187 05              1187  938        DC    XL1'05'
    1188 0800            1189  939        DC    XL2'0800'          -EXPECTED.
    118A 0000            118B  940 SNSBB  DC    XL2'0000'          -ACTUAL.
    118C FF              118C  941        DC    XL1'FF'
    118D C0 87 139C            942        B     MAPS               POINT TO MAP CHART.
    1191 9352            1192  943        DC    XL2'9352'          -PAGE 935, ENTRY 2.
    1193 C0 87 C222            944        B     HALT               ERROR HALT -32-.
    1197 4032            1198  945        DC    XL2'4032'
    1199 C0 87 0216            946        B     LINK               RETURN TO DCP.
                               947
                               948 *********
                               949 * RTN0C *
                               950 ************************************************************************
                               951 *                                                                      *
                               952 *       ROUTINE 0C        TEST EVEN PARITY AND WRAP VARIOUS PATTERNS    *
                               953 *                         TO THE I/O TRANSFER LINES.                   *
                               954 *                                                                      *
                               955 ************************************************************************
    119D 0C              119D  956 RTN0C  DC    XL1'0C'            ROUTINE NUMBER
    119E 00              119E  957        DC    XL1'00'            NO MANUAL INTERVENTION REQUIRED
    119F FFFF            11A0  958        DC    XL2'FFFF'          LAST ROUTINE.
                               959
    11A1 C0 87 021A            960        B     PRINT              PRINT LATCH TEST HEADING.
    11A5 45              11A5  961        DC    XL1'45'
    11A6 37              11A6  962        DC    IL1'55'
    11A7 1C29            11A8  963        DC    AL2(HD0C)
    11A9 40AC            11AA  964        DC    XL2'40AC'
                               965
    11AB C0 87 131D            966        B     INITL              INITIALIZE THE 3741
                               967
    11AF C0 87 13C3            968        B     QUES               CHECK FOR SSW10.
    11B3 F0 3C 3C              969        HPL   X'3C',X'3C'        HALT -FF- IF ON.
                               970
    11B6 31 45 16B5            971        LIO   H002C,X'45'        LOAD THE DATA TRANS REG WITH A -2C-.
    11BA 30 43 164D            972        SNS   TEST,X'43'         SENSE I/O TRANS LINES FOR -F82C-.
    11BE 31 41 16A9            973        LIO   H0880,X'41'        PUT 3741 IN EVEN PARITY MODE.
    11C2 31 45 16B5            974        LIO   H002C,X'45'        LOAD SAME TEST PATTERN -2C- IN DTR.
    11C6 30 43 164E            975        SNS   TEST-2,X'43'       SENSE I/O TRANS LINES FOR -F92C-.
                               976
    11CA 39 01 164C            977        TBF   TEST-1,X'01'       PARITY BIT OFF AS EXPECTED ?
    11CE F2 90 CE              978        JF    PARITY             JUMP IF NOT.
                               979
    11D1 38 01 164A            980        TBN   TEST-3,X'01'       PARITY BIT ON AS EXPECTED ?
    11D5 F2 90 C7              981        JF    PARITY             JUMP IF NOT.
                               982
    11D8 31 41 16A7            983        LIO   H0080,X'41'        PUT 3741 IN JUST DIAGNOSTIC MODE.
    11DC 31 45 1699            984        LIO   H0000,X'45'        CLEAR DATA TRANSFER REGISTER.
    11E0 31 41 16AB            985        LIC   H0190,X'41'        SET SLAVE LATCH IN FNCT REG.
    11E4 F3 43 10              986        SIO   X'10',X'43'        ISSUE CONTROL 1 START I/O.
    11E7 31 45 16A1            987        LIO   H0004,X'45'        LOAD -04- IN DATA TRANS REG.
    11EB 31 45 1699            988        LIC   H0000,X'45'        CLEAR DATA TRANS REG.
    11EF 30 43 1656            989        SNS   SNS0C,X'43'        SENSE TRANS LINES -F906-.
                               990
    11F3 3C 06 1654            991        MVI   SNS0C-2,X'06'
    11F7 3D 06 1656            992        CLI   SNS0C,X'06'        TRANS LINES AS EXPECTED ?
    11FB F2 01 BB              993        JNE   ER0C               JUMP IF NOT.
                               994
    11FE 31 41 16AD            995        LIO   H0180,X'41'        RELOAD FUNCTION REGISTER.
    1202 30 43 1656            996        SNS   SNS0C,X'43'        SENSE TRANS LINES -F900-.
                               997
    1206 3C 00 1654            998        MVI   SNS0C-2,X'00'
    120A 3D 00 1656            999        CLI   SNS0C,X'00'        TRANS LINES AS EXPECTED ?
    120E F2 01 A8             1000        JNE   ER0C               JUMP IF NOT.
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                            1001
    1211 31 41 16AF         1002        LIO   H01A0,X'41'        SET UP FUNCTION REGISTER.
    1215 31 45 16CC         1003        LIO   H0008,X'45'        LOAD -08- IN DATA TRANS REG.
    1219 31 45 1699         1004        LIO   H0C00,X'45'        CLEAR DATA TRANS REG.
    121D 30 43 1656         1005        SNS   SNS0C,X'43'        SENSE TRANS LINES -F90A-.
                            1006
    1221 3C 0A 1654         1007        MVI   SNS0C-2,X'0A'
    1225 3D 0A 1656         1008        CLI   SNS0C,X'0A'        TRANS LINES AS EXPECTED ?
    1229 F2 01 8D           1009        JNE   ER0C               JUMP IF NOT.
                            1010
    122C 31 41 16AD         1011        LIO   H0180,X'41'        RELOAD FUNCTION REGISTER.
    1230 30 43 1656         1012        SNS   SNS0C,X'43'        SENSE TRANS LINES -F900-.
                            1013
    1234 3C 00 1654         1014        MVI   SNS0C-2,X'00'
    1238 3D 00 1656         1015        CLI   SNS0C,X'00'        TRANS LINES AS EXPECTED ?
    123C F2 01 7A           1016        JNE   ER0C               JUMP IF NOT.
                            1017
    123F 31 41 16AD         1018        LIO   H0180,X'41'        SET FUNCTION REGISTER.
    1243 31 45 16A5         1019        LIO   H0020,X'45'        LOAD -20- IN DATA TRANS REG.
    1247 31 45 1699         1020        LIO   H0C00,X'45'        CLEAR OUT DATA TRANS REG.
    124B 30 43 1656         1021        SNS   SNS0C,X'43'        SENSE TRANS LINES -F922-.
                            1022
    124F 3C 22 1654         1023        MVI   SNS0C-2,X'22'
    1253 3D 22 1656         1024        CLI   SNS0C,X'22'        TRANS LINES AS EXPECTED ?
    1257 F2 01 5F           1025        JNE   ER0C               JUMP IF NOT.
                            1026
    125A 31 41 16A7         1027        LIO   H0080,X'41'        PUT 3741 IN DIAGNOSTIC MODE.
    125E 30 43 1656         1028        SNS   SNS0C,X'43'        SENSE TRANS LINES -F900-.
                            1029
    1262 3C 00 1654         1030        MVI   SNS0C-2,X'00'
    1266 3D 00 1656         1031        CLI   SNS0C,X'00'        TRANS LINES AS EXPECTED ?
    126A F2 01 4C           1032        JNE   ER0C               JUMP IF NOT.
                            1033
    126D 31 41 16AD         1034        LIO   H0180,X'41'        SET UP FUNCTION REGISTER.
    1271 31 45 1681         1035        LIO   H0040,X'45'        LOAD -40- IN DATA TRANS REG.
    1275 31 45 1699         1036        LIO   H0000,X'45'        CLEAR DATA TRANS REG.
    1279 30 43 1656         1037        SNS   SNS0C,X'43'        SENSE TRANS LINES -F942-.
                            1038
    127D 3C 42 1654         1039        MVI   SNS0C-2,X'42'
    1281 3D 42 1656         1040        CLI   SNS0C,X'42'        TRANS LINES AS EXPECTED ?
    1285 F2 01 31           1041        JNE   ER0C               JUMP IF NOT.
                            1042
    1288 31 41 16A7         1043        LIO   H0080,X'41'        PUT 3741 IN DIAGNOSTIC MODE.
    128C 30 43 1656         1044        SNS   SNS0C,X'43'        SENSE TRANS LINES -F900-.
                            1045
    1290 3C 00 1654         1046        MVI   SNS0C-2,X'00'
    1294 3D 00 1656         1047        CLI   SNS0C,X'00'        TRANS LINES AS EXPECTED ?
    1298 F2 01 1E           1048        JNE   ER0C               JUMP IF NOT.
                            1049
    129B C0 87 021E         1050        B     LINK               RETURN TO DCP.
                            1051
                            1052 *  ROUTINE 0C ERROR MESSAGES  *
                            1053
    129F C0 87 021A         1054 PARITY B     PRINT              PRINT PARITY CHECK.
    12A3 C2                 12A3 1055        DC    XL1'C2'
    12A4 0D                 12A4 1056        DC    IL1'13'
    12A5 1A38               12A6 1057        DC    AL2(PRCK)
    12A7 4033               12A8 1058        DC    XL2'4033'
    12A9 C0 87 139C         1059        B     MAPS               POINT TO MAP CHART.
    12AD 9353               12AE 1060        DC    XL2'9353'          -PAGE 935, ENTRY 3.
    12AF C0 87 0222         1061        B     HALT               ERROR HALT -33-.
    12B3 4033               12B4 1062        DC    XL2'4033'
    12B5 C0 87 0216         1063        B     LINK               RETURN TO DCP.
                            1064
    12B9 C0 87 021A         1065 ER0C   B     PRINT              PRINT SENSE CHECK.
    12BD C2                 12BD 1066        DC    XL1'C2'
    12BE 1E                 12BE 1067        DC    IL1'30'
    12BF 19F0               12C0 1068        DC    AL2(STRC)
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    12C1 4034            12C2 1069         DC    XL2'4034'
    12C3 0C 11 1D39 17E8      1070         MVC   PRT-47(18),NCD3
    12C9 C0 87 1377           1071         B     EPRNT2          PRINT TRANS LINE HEADING.
    12CD 0C 09 1D34 1840      1072         MVC   PRT-52(10),EB1
    12D3 C0 87 136C           1073         B     EPRNT1          PRINT EB1 HEADING.
    12D7 0C 0E 1D37 182C      1074         MVC   PRT-49(15),BITS
    12DD C0 87 1377           1075         B     EPRNT2          PRINT BIT LABLES.
    12E1 C2 02 165E           1076         LA    WORK,XR2        SET UP OUTPUT ADDRESSES.
    12E5 C2 01 1D37           1077         LA    PRT-49,XR1
    12E9 0C 01 1439 1654      1078         MVC   XPT(2),SNS0C-2  STORE EXPECTED BYTES.
    12EF 0C 01 1438 1656      1079         MVC   ACT(2),SNS0C    STORE ACTUAL BYTES.
    12F5 C0 87 14DE           1080         B     BITSNF          CALCULATE STATUS OF ACTUAL.
    12F9 143B            12FA 1081         DC    AL2(ACT)
    12FB C0 87 136C           1082         B     EPRNT1          PRINT THIS STATUS.
    12FF 0C 0A 1D24 17A7      1083         MVC   PRT-68(11),ERS
    1305 C0 87 143C           1084         B     CMPARE          CALCULATE ERROR BITS.
    1309 C0 87 1377           1085         B     EPRNT2          PRINT THESE BITS.
    130D C0 87 139C           1086         B     MAPS            POINT TO MAP CHART.
    1311 9354            1312 1087         DC    XL2'9354'       -PAGE 935, ENTRY 4.
    1313 C0 87 0222           1088         B     HALT            ERROR HALT -34-.
    1317 4034            1318 1089         DC    XL2'4034'
    1319 C0 87 0216           1090         B     LINK            RETURN TO DCP.
                              1091
                              1092 *********************************************************************
                              1093 * INITL *                                                          *
                              1094 *********                THIS SUBROUTINE INITIALIZES THE 3741     *
                              1095 *                        BEFORE A TEST ROUTINE IS EXECUTED.       *
                              1096 *                                                                 *
                              1097 *********************************************************************
    131D 34 08 1337           1098 INITL ST    INTL+3,ARR       SAVE RETURN ADDRESS.
    1321 31 41 16A7           1099        LIO   H0C80,X'41'      SET FUNCTION REG TO DIAGNOSTIC MODE
    1325 31 42 1699           1100        LIO   H0000,X'42'      ZERO LENGTH COUNT REGISTER.
    1329 31 45 1699           1101        LIO   H0C00,X'45'      ZERO DATA TRANSFER REGISTER.
    132D F3 40 0D             1102        SIO   X'0D',X'40'      DO GENERAL SIO RESET TO 3741
    1330 C1 40 1338           1103        TIO   NTRDY,X'40'      MAKE SURE 3741 IS READY BEFORE TEST.
    1334 C0 87 0000           1104 INTL  B     *-*
                              1105
                              1106 *********************************************************************
                              1107 * TIOERS *                                                         *
                              1108 **********              SUBROUTINE PRINTS OUT TIO ERRORS.          *
                              1109 *                                                                 *
                              1110 *********************************************************************
    1338 C0 87 021A           1111 NTRDY B     PRINT            PRINT 3741 IS NOT READY.
    133C C2              133C 1112        DC    XL1'C2'
    133D 12              133D 1113        DC    IL1'18'
    133E 1652            133F 1114        DC    AL2(NCRDY)
    1340 403E            1341 1115        DC    XL2'403E'
    1342 C0 87 139C           1116        B     MAPS             POINT TO MAP CHART.
    1346 9071            1347 1117        DC    XL2'9071'        -PAGE 907, ENTRY 1.
    1348 C0 87 0222           1118        B     HALT             ERROR HALT -3E-.
    134C 403E            134D 1119        DC    XL2'403E'
    134E C0 87 0216           1120        B     LINK             RETURN TO DCP.
                              1121
    1352 C0 87 021A           1122 BUSY  B     PRINT            PRINT 3741 IS BUSY.
    1356 C2              1356 1123        DC    XL1'C2'
    1357 0D              1357 1124        DC    IL1'13'
    1358 165F            1359 1125        DC    AL2(BISY)
    135A 403F            135B 1126        DC    XL2'403F'
    135C C0 87 139C           1127        B     MAPS             POINT TO MAP CHART.
    1360 9522            1361 1128        DC    XL2'9522'        -PAGE 952, ENTRY 2.
    1362 C0 87 0222           1129        B     HALT             ERROR HALT -3F-.
    1366 403F            1367 1130        DC    XL2'403F'
    1368 C0 87 0216           1131        B     LINK             RETURN TO DCP.
                              1132
                              1133 *********************************************************************
                              1134 * XPRNTX *                                                         *
                              1135 **********              SUBROUTINE SETS UP ERROR PRINTING.         *
                              1136 *                                                                 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1137 *********************************************************************
    136C 34 08 1398           1138 EPRNT1 ST    PRT+3,ARR        STORE RETURN ADDRESS.
    1370 3C 01 136E           1139        MVI   LINE,X'81'       SET UP TO SPACE 1 LINE.
    1374 F2 87 13             1140        J     PRNT
    1377 34 08 1398           1141 EPRNT2 ST    PRT+3,ARR        STORE RETURN ADDRESS.
    137B 3C 02 136E           1142        MVI   LINE,X'82'       SET UP TO SPACE 2 LINES.
    137F F2 87 08             1143        J     PRNT
    1382 34 08 1398           1144 EPRNT6 ST    PRT+3,ARR        STORE RETURN ADDRESS.
    1386 3C 06 136E           1145        MVI   LINE,X'36'       SET UP TO SPACE 6 LINES.
                              1146
    138A C0 87 021A           1147 PRNT  B     PRINT            PRINT THE ERROR MESSAGE IN 'PRT'.
    138E 00              138E 1148 LINE  DC    XL1'00'
    138F 5B              138F 1149        DC    IL1'91'
    1390 1D68            1391 1150        DC    AL2(PRT)
    1392 0C 5A 1D68 1D69      1151        MVC   PRT(91),PRT+1    CLEAR ERROR MESSAGE AREA.
    1398 C0 87 0000           1152 PRTT  B     *-*              RETURN TO ROUTINE.
                              1153
                              1154 *********************************************************************
                              1155 * MAPS *                                                          *
                              1156 ********                THE MAP CHART REFERENCE IS PRINTED. CALL  *
                              1157 *                       SUBROUTINE BY -                           *
                              1158 *                                                                 *
                              1159 *                       B     MAPS                                *
                              1160 *                       DC    XL2'PAGE NUMBER AND ENTRY NUMBER'   *
                              1161 *                                                                 *
                              1162 *********************************************************************
    139C 34 08 164D           1163 MAPS  ST    TEMP,ARR         STORE ARR.
    13A0 38 01 164C           1164        L     TEMP,XR1         LOAD XR1 WITH ARR ADDRESS.
    13A4 18 02 1A4F 00        1165        MNZ   MAPSS-11,0(,XR1) STORE HUNDREDS DIGIT OF PAGE #.
    13A9 18 03 1A50 00        1166        MNN   MAPSS-10,0(,XR1) STORE TENS DIGIT OF PAGE #.
    13AE 18 02 1A51 01        1167        MNZ   MAPSS-9,1(,XR1)  STORE UNITS DIGIT OF PAGE #.
    13B3 18 03 1A59 01        1168        MNN   MAPSS-1,1(,XR1)  STORE ENTRY DIGIT.
    13B8 C0 87 021A           1169        B     PRINT            PRINT GO TO MAPS.
    13BC 86              13BC 1170        DC    XL1'86'
    13BC 22              13BD 1171        DC    IL1'34'
    13BE 1A5A            13BF 1172        DC    AL2(MAPSS)
    13C0 D0 87 02             1173        B     2(,XR1)          RETURN TO ROUTINE.
                              1174
                              1175 *********************************************************************
                              1176 * QUES *                                                          *
                              1177 ********                SUBROUTINE DETERMINES IF SSW 10 IS ON.    *
                              1178 *                                                                 *
                              1179 *********************************************************************
    13C3 34 08 13D7           1180 QUES  ST    QS+3,ARR         STORE RETURN ADDRESS.
    13C7 38 E0 020A           1181        TBN   SBYTE2,SSW10     SSW 10 ON ?
    13CB F2 1C 0A             1182        JT    QST              RETURN TO PRGM HALT IF YES.
    13CE 0E 01 13D7 169F      1183        ALC   QS+3(2),N003     INCR RETURN TO SKIP HALT.
    13D4 C0 87 0000           1184 QS    B     *-*              RETURN TO ROUTINE.
                              1185
    13D8 3D C2 0200           1186 QST   CLI   X'0200',X'C2'    IS THIS A MODULE B SYSTEM ?
    13DC C0 01 13D4           1187        BNE   QS               DO A NORMAL HALT IF NOT.
    13E0 38 01 13D7           1188        L     QS+3,XR1
    13E4 4C 01 02 1683        1189        MVC   2(2,XR1),HFFF8   SET UP MODULE B HALT.
    13E9 C0 87 13D4           1190        B     QS               GO HALT.
                              1191
                              1192 *********************************************************************
                              1193 * CKPAT *                                                         *
                              1194 *********                SUBROUTINE COMPARES ACTUAL SENSE          *
                              1195 *                        PATTERN VS A TABLE OF EXPECTED            *
                              1196 *                        PATTERNS AND PRINTS THE CORRS ERROR       *
                              1197 *                        MESSAGE.                                  *
                              1198 *                                                                  *
                              1199 *********************************************************************
    13ED 36 08 169B           1200 CKPAT A     N001,ARR
    13F1 34 0E 13F8           1201        ST    **+7,ARR
    13F5 38 01 0000           1202        L     *-*,XR1          STORE PATTERN TABLE ADDRS.
    13F9 3E 08 169D           1203        A     N002,ARR
    13FD 34 08 1404           1204        ST    **+7,ARR
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1401 35 02 0000          1205         L     *-*,XR2          STORE ERROR MESSAGE ADDRS.
   1405 36 C8 1698          1206         A     ND01,ARR
   1409 34 08 1437          1207         ST    PATCK+3,ARR      STORE RETURN ADDRESS.
                            1208
   140D 4D 05 06 164D       1209 CKS     CLC   6(6,XR1),TEST    COMPARE TABLE PATTERN VS ACTUAL.
   1412 F2 01 10            1210         JNE   TRY              JUMP IF NO COMPARE.
   1415 2C 01 1421 02       1211         MVC   ERMS,2(2,XR2)    LOAD MESSAGE ADDRESS IN PRINT MESS.
   141A C0 87 021A          1212         B     PRINT            PRINT CORRS ERROR MESSAGE.
   141E 82                  141E 1213    DC    XL1'82'
   141F 18                  141F 1214    DC    XL1'24'
   1420 0000                1421 1215 ERMS  DC    AL2(*-*)
   1422 F2 87 0F            1216         J     PATCK
   1425 36 01 16A3          1217 TRY     A     N006,XR1         INCREMENT THE TABLE POINTERS.
   1429 36 02 169D          1218         A     N002,XR2
   142D 7D FF C1            1219         CLI   1(,XR1),X'FF'    END OF TABLE YET ?
   1430 C0 01 140D          1220         BNE   CKS              CONTINUE IF NOT.
   1434 C0 87 0000          1221 PATCK   B     *-*              RETURN TO ROUTINE.
                            1222
                            1223 ********************************************************************************
                            1224 * CMPARE *                                                                     *
                            1225 **********          EXPECTED EB1 & EB2 BYTES ARE COMPARED                      *
                            1226 *                    AND ERROR BITS ARE IDENTIFIED BY A -*-                    *
                            1227 *                    IN THE OUTPUT AREA.                                       *
                            1228 *                                                                              *
                            1229 ********************************************************************************
   1438 0000                1439 1230 XPT   DC    XL2'0000'        EXPECTED EB1 & EB2 BYTES.
   143A 0000                143B 1231 ACT   DC    XL2'0000'        ACTUAL EB1 & EB2 BYTES.
                            1232
   143C 34 08 1497          1233 CMPARE  ST    CMPR+3,ARR       STORE RETURN ADDRESS.
   1440 34 02 14CF          1234         ST    TAERR+3,XR2      INITIALIZE OUTPUT ADDRESSES.
   1444 34 01 14D7          1235         ST    TBERR+3,XR1
   1448 3C 01 1461          1236         MVI   TA2+1,X'01'      INITIALIZE BIT POINTERS.
   144C 3C 01 1468          1237         MVI   TA2+1,X'01'
   1450 3C 01 1472          1238         MVI   TA1+1,X'01'
   1454 3C 01 1479          1239         MVI   TB3+1,X'01'
   1458 3C 01 1480          1240         MVI   TB2+1,X'01'
   145C 3C 01 148A          1241         MVI   TB1+1,X'01'
                            1242
   1460 38 01 1438          1243 TA3     TBN   XPT-1,X'01'      EXPECTED BIT ON IN EB2 BYTE ?
   1464 F2 10 0A            1244         JT    TA1              JUMP IF YES.
   1467 38 01 143A          1245 TA2     TBN   ACT-1,X'01'      ACTUAL BIT ON IN EB2 BYTE ?
   146B F2 10 5E            1246         JT    TAERR            GO PUT AN -*- IN OUTPUT IF SO.
   146E F2 87 C7            1247         J     TB3              CHECK EB1 BYTE.
                            1248
   1471 38 01 143A          1249 TA1     TBN   ACT-1,X'01'      ACTUAL BIT ON IN EB2 BYTE ?
   1475 F2 90 54            1250         JF    TAERR            GO PUT AN -*- IN OUTPUT IF OFF.
                            1251
   1478 38 01 1439          1252 TB3     TBN   XPT,X'01'        EXPECTED BIT ON IN EB1 BYTE ?
   147C F2 10 0A            1253         JT    TB1              JUMP IF SO.
   147F 38 01 143B          1254 TB2     TBN   ACT,X'01'        ACTUAL BIT ON IN EB1 BYTE ?
   1483 F2 10 4E            1255         JT    TBERR            GO PUT AN -*- IN OUTPUT IF SO.
   1486 F2 87 C7            1256         J     TC               CONTINUE ANALYSIS.
                            1257
   1489 38 01 143B          1258 TB1     TBN   ACT,X'01'        ACTUAL BIT ON IN EB1 BYTE ?
   148D F2 90 44            1259         JF    TBERR            GO PUT AN -*- IN OUTPUT IF OFF.
                            1260
   1490 38 80 148A          1261 TC      TBN   TB1+1,X'80'      BIT 0 BEEN TESTED ?
   1494 C0 1C 0000          1262 CMPR    BT    *-*              RETURN IF SO.
   1498 0E 00 1472 1472             263         ALC   TA1+1(1),TA1+1   INCREMENT BIT POINTERS.
   149E 0E 00 1468 1468             264         ALC   TA2+1(1),TA2+1
   14A4 0E 00 1461 1461             265         ALC   TA3+1(1),TA3+1
   14AA 0E 00 148A 148A             266         ALC   TB1+1(1),TB1+1
   14B0 0E 00 1480 1480             267         ALC   TB2+1(1),TB2+1
   14B6 0E 00 1479 1479             268         ALC   TB3+1(1),TB3+1
   14BC 0F 01 14CF 169D             269         SLC   TAERR+3(2),N002
   14C2 0F 01 14D7 169D             270         SLC   TBERR+3(2),N002
   14C8 C0 87 1460                  271         B     TA3        GO CHECK NEW BIT.
                                    272
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   14CC 3C 5C 0000          1273 TAERR   MVI   *-*,X'EC'      PUT -*- IN EB2 OUTPUT.
   14D0 C0 87 1478          1274         B     TB3              CONTINUE CHECK.
   14D4 3C 5C 0000          1275 TBERR   MVI   *-*,X'EC'      PUT -*- IN EB1 OUTPUT.
   14D8 C0 87 1490          1276         B     TC               CONTINUE CHECK.
                            1277
                            1278 ********************************************************************************
                            1279 * BITSNF *                                                                     *
                            1280 **********          THE EB1 & 2 BYTES ARE CONVERTED TO                         *
                            1281 *                    A PRINTABLE BINARY FORM.                                  *
                            1282 *                                                                              *
                            1283 ********************************************************************************
   14DC 00                  14DC 1284 EB2T  DC    XL1'00'          TEMPORARY STORAGE FOR EB2 & EB1
   14DD 00                  14DD 1285 EB1T  DC    XL1'00'           BYTES.
                            1286
   14DE 36 C8 1698          1287 BITSNF  A     N001,ARR
   14E2 34 C8 14EB          1288         ST    **8,ARR
   14E6 0C 01 14F1 0000     1289         MVC   **11(2),*-*
   14EC 0C 01 14DD 0000     1290         MVC   EB1T(2),*-*      STORE EB1 & EB2 BYTES.
   14F2 36 08 1698          1291         A     N001,ARR         STORE RETURN ADDRESS.
   14F6 34 08 153D          1292         ST    BTNF+3,ARR       INITIALIZE BIT POINTERS.
   14FA 3C 01 150B          1293         MVI   TNF+1,X'01'
   14FE 3C 01 1521          1294         MVI   TNFF+1,X'01'
   1502 34 02 151F          1295         ST    NF+3,XR2         STORE OUTPUT ADDRESSES.
   1506 34 01 1535          1296         ST    NFF+3,XR1
                            1297
   150A 38 00 14DC          1298 TNF     TBN   EB2T,X'00'       THIS BIT ON IN EB2 ?
   150E F2 10 07            1299         JT    ITSON            JUMP IF SO.
   1511 3C F0 1518          1300         MVI   NF+1,X'F0'       MOVE IN A -0-.
   1515 F2 87 04            1301         J     NF
   1518 3C F1 151D          1302 ITSON   MVI   NF+1,X'F1'       MOVE IN A -1-.
   151C 3C 00 0000          1303 NF      MVI   *-*,X'00'        PUT I/O IN OUTPUT.
                            1304
   1520 38 00 14DD          1305 TNFF    TBN   EB1T,X'00'       THIS BIT ON IN EB1 ?
   1524 F2 10 07            1306         JT    ITON             JUMP IF SO.
   1527 3C F0 1533          1307         MVI   NFF+1,X'F0'      MOVE IN A -0-.
   152B F2 87 04            1308         J     NFF
   152E 3C F1 1533          1309 ITON    MVI   NFF+1,X'F1'      MOVE IN A -1-.
   1532 3C 00 0000          1310 NFF     MVI   *-*,X'00'        PUT I/O IN OUTPUT.
                            1311
   1536 38 80 150B          1312         TBN   TNF+1,X'80'      CHECKED BIT 0 ?
   153A C0 10 0000          1313 BTNF    BT    *-*              RETURN IF SO.
   153E 0E 00 150B 150B     1314         ALC   TNF+1(1),TNF+1   INCREMENT BIT POINTERS.
   1544 0E 00 1521 1521     1315         ALC   TNFF+1(1),TNFF+1
   154A 0F 01 151F 169D     1316         SLC   NF+3(2),N002     DECREMENT OUTPUT ADRS.
   1550 0F 01 1535 169D     1317         SLC   NFF+3(2),N002
   1556 C0 87 150A          1318         B     TNF              CONTINUE CHECK.
                            1319
                            1320 ********************************************************************************
                            1321 * ERROR *                                                                      *
                            1322 *********          SUBROUTINE IDENTIFIES SENSE BYTE AND                       *
                            1323 *                    PRINTS ITS STATUS AND ERRORS.                             *
                            1324 *                    SUBROUTINE CALLED BY -                                    *
                            1325 *                                                                              *
                            1326 *                      B     ERROR                                             *
                            1327 *                      DC    XL1'N CODE IN HEX'                                *
                            1328 *                      DC    XL2'EXPECTED DATA'                                *
                            1329 *                      DC    XL2'ACTUAL DATA'                                  *
                            1330 *                      DC    XL1'A -FF- DESIGNATES END'                        *
                            1331 *                                                                              *
                            1332 ********************************************************************************
   155A 00                  155A 1333 NCOD  DC    XL1'00'          CURRENT N CODE STORAGE.
   155B 34 0E 1562          1334 ERRCR   ST    **7,ARR          STORE RETURN ADDRESS IN XR1.
   155F C2 01 0000          1335         LA    *-*,XR1
                            1336
   1563 34 01 156C          1337 CKIT    ST    **9,XR1
   1567 0C 00 155A 0000     1338         MVC   NCOD(1),*-*      BRING IN N CODE FOR CHECKING.
   156D 3D FF 155A          1339         CLI   NCOD,X'FF'       EXIT IF DETECTED 'END FLAG'.
   1571 F2 E1 C8            1340         JE    CKCUT
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         1341
   1574 0C 5A 1D68 1D69  1342        MVC   PRT(91),PRT+1        BLANK OUT PRINT BUFFER
   157A 3D 01 155A       1343        CLI   NCOD,X'01'          IDENTIFY AND SET-UP BYTE HEADING.
   157E F2 01 06         1344        JNE   *+9
   1581 0C 10 1D41 17BB  1345        MVC   PRT-39(17),NCD1     * FUNCTION.
   1587 3D 02 155A       1346        CLI   NCOD,X'02'
   158B F2 01 0C         1347        JNE   *+15
   158E 0C 0A 1D35 17C3  1348        MVC   PRT-51(11),NCD2-22  * STATUS-LCR.
   1594 0C 0F 1D4C 17D4  1349        MVC   PRT-28(16),NCD2-5
   159A 3D 03 155A       1350        CLI   NCOD,X'03'
   159E F2 01 06         1351        JNE   *+9
   15A1 0C 11 1D42 17EB  1352        MVC   PRT-38(18),NCD3     * I/O TRANSFER LINES.
   15A7 3D 04 155A       1353        CLI   NCOD,X'04'
   15AB F2 01 06         1354        JNE   *+9
   15AE 0C 0B 1D3F 17F7  1355        MVC   PRT-41(12),NCD4     * DATA ADDRESS.
   15B4 3D 05 155A       1356        CLI   NCOD,X'05'
   15B8 F2 01 0C         1357        JNE   *+15
   15BB 0C 0E 1D37 1606  1358        MVC   PRT-49(15),NCD5-23  * DIAGNOSTIC-DTR.
   15C1 0C 10 1D4C 1618  1359        MVC   PRT-28(17),NCD5-5
   15C7 C0 87 1377       1360        B     EPRNT2              PRINT BYTE ID'S.
                         1361
   15CB 0C 09 1D34 1836  1362        MVC   PRT-52(10),EB2      BUILD EB BYTE HEADINGS.
   15D1 0C 09 1D4B 1640  1363        MVC   PRT-32(10),EB1
   15D7 C0 87 136C       1364        B     EPRNT1              PRINT EB BYTE HEADINGS.
   15DB 0C 0E 1D37 182C  1365        MVC   PRT-49(15),BITS     BUILD BIT LABE HEADINGS.
   15E1 0C 0E 1D4B 182C  1366        MVC   PRT-29(15),BITS
   15E7 C0 87 1377       1367        B     EPRNT2              PRINT BIT LABLE HEADINGS.
   15EB 58 01 169D       1368        A     N002,XR1
   15EF 34 01 15F8       1369        ST    **5,XR1
   15F3 0C 01 1439 0000  1370        MVC   XPT(2),*-*          STORE EXPECTED BYTES.
   15F9 36 01 169D       1371        A     N002,XR1
   15FD 34 01 1606       1372        ST    **5,XR1
   1601 0C 01 1438 0000  1373 XYR1   MVC   ACT(2),*-*          STORE ACTUAL BYTES.
   1607 C2 02 1D37       1374        LA    PRT-49,XR2          STORE OUTPUT ADDRESSES.
   160B C2 01 1D4B       1375        LA    PRT-29,XR1
   160F C0 87 14DE       1376        B     BITSNF              GO CALCULATE STATUS OF ACTUAL BYTES.
   1613 143B        1614 1377        DC    AL2(ACT)
   1615 C0 87 136C       1378        B     EPRNT1              PRINT STATUS/REGISTER ID.
   1619 0D 01 1439 143B  1379        CLC   XPT(2),ACT          EXPECTED AND ACTUAL EQUAL ?
   161F F2 81 0A         1380        JE    SKPER               JUMP IF SO.
   1622 0C 0A 1D24 17A7  1381        MVC   PRT-68(11),ERS
   1628 C0 87 143C       1382        B     CMPARE              GO CALCULATE ERROR BITS.
   162C C0 87 1377       1383 SKPER  B     EPRNT2              PRINT ERROR BITS.
   1630 35 01 15E6       1384        L     XYR1+5,XR1          RESTORE XR1.
   1634 36 01 169B       1385        A     N001,XR1
   1638 C0 87 1563       1386        B     CKIT                GO CHECK FOR NEXT BYTE.
   163C 36 01 169B       1387 CKOUT  A     N001,XR1            INCREMENT RETURN ADDRESS.
   1640 34 01 1647       1388        ST    **7,XR1             RETURN TO ROUTINE.
   1644 C0 87 0000       1389        B     *-*
                         1390
                         1391 ************
                         1392 * RESERVED *
                         1393 ********************************************************************************
   1648 000000000000     164D 1394 TEST   DC    6XL1'00'            ACTUAL SENSE DATA STORAGE.
   164E 00000000000000 1656 1395 WORK   DC    9XL1'00'            WORK AREA.
   1656 CC              1395
                         1396 **********
                         1397 * TABLES *
                         1398 ********************************************************************************
                         1399
                    1656 1400 EXPY   EQU   *-1   TABLE OF ROUTINE 05'S ERROR PATTERNS.
   1657 03C0E100FD00 165C 1401        DC    XL6'03C0E100FD00'   EOT CHECK.
   165D 0300C100FD00 1662 1402        DC    XL6'0300C100FD00'   END RESET - 0.
   1663 0000E100F900 1668 1403        DC    XL6'0000E100F900'   DISCONNECT CHECK.
   1669 0B00E100FD02 166E 1404        DC    XL6'0B00E100FD02'   END RESET - 1.
   166F 0800C100F902 1674 1405        DC    XL6'0800C100F902'   INTR PENDING CK.
   1675 0000C100F900 167A 1406        DC    XL6'0000C100F900'   END RESET - 2.
   167B 0800E100F900 1680 1407        DC    XL6'0800E100F900'   DISCONNECT DRIVER CHECK.
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   1681 0E00E100F902     1686 1408        DC    XL6'0800E100F902'   ATTACHMENT DRIVER CHECK.
   1687 FF               1687 1409        DC    XL1'FF'             * END OF TABLE *
                         1410
                         1687 1411 ERMS05 EQU   *-1   TABLE OF CORRESPONDING ERROR MESSAGE ADDRESSES.
   1688 1C41             1689 1412        DC    AL2(MS5A)
   168A 1C59             168B 1413        DC    AL2(MS5B)
   168C 1C71             1680 1414        DC    AL2(MS5C)
   168E 1C89             168F 1415        DC    AL2(MS5D)
   1690 1CA1             1691 1416        DC    AL2(MS5E)
   1692 1CB9             1693 1417        DC    AL2(MS5F)
   1694 1CD1             1695 1418        DC    AL2(MS5G)
   1696 1CE9             1697 1419        DC    AL2(MS5H)
                         1420
                         1421 ************
                         1422 * CONSTANTS *
                         1423 ********************************************************************************
   1698 0000             1699 1424 N000   DC    XL2'00'
   169A 0001             169B 1425 N001   DC    XL2'1'
   169C 0002             169D 1426 N002   DC    XL2'2'
   169E 0003             169F 1427 N003   DC    XL2'3'
   16A0 0004             16A1 1428 N004   DC    XL2'4'
   16A2 0006             16A3 1429 N006   DC    XL2'6'
   16A4 0020             16A5 1430 H0020  DC    XL2'0020'
   16A6 0080             16A7 1431 H0080  DC    XL2'0080'
   16A8 0880             16A9 1432 H0880  DC    XL2'0880'
   16AA 0190             16AB 1433 H0190  DC    XL2'0190'
   16AC 0180             16AD 1434 H0180  DC    XL2'0180'
   16AE 01A0             16AF 1435 H01A0  DC    XL2'01A0'
   16B0 0040             16B1 1436 H0040  DC    XL2'0040'
   16B2 FFF8             16B3 1437 HFFF8  DC    XL2'FFF8'
   16B4 002C             16B5 1438 H002C  DC    XL2'002C'
   16B6 FD55             16B7 1439 HFD55  DC    XL2'FD55'
   16B8 F9AA             16B9 1440 HF9AA  DC    XL2'F9AA'
   16BA 0082             16BB 1441 H0082  DC    XL2'0082'
   16BC 01B8             16BD 1442 H01B8  DC    XL2'01B8'
   16BE 08B2             16BF 1443 H08B2  DC    XL2'08B2'
   16C0 00FF             16C1 1444 H00FF  DC    XL2'00FF'
   16C2 0010             16C3 1445 H0010  DC    XL2'0010'
   16C4 3082             16C5 1446 H3082  DC    XL2'3082'
   16C6 3080             16C7 1447 H3080  DC    XL2'3080'
   16C8 FC04             16C9 1448 HFC04  DC    XL2'FC04'
   16CA FE00             16CB 1449 HFE00  DC    XL2'FE00'
   16CC 0885             16CD 1450 H0885  DC    XL2'0885'
   16CE 164E             16CF 1451 DATA   DC    AL2(DADATA)
   16D0 C1C1             16D1 1452 CAA    DC    CL2'AA'
   16D2 F5F5             16D3 1453 C55    DC    CL2'55'
                         1454
                         1455 ************
                         1456 * MESSAGES *
                         1457 ********************************************************************************
                    16D3 1458 MSG1B  EQU   *-1
   16D4 C9D5E2C5D5E340E3 16FA 1459 MSG1   DC    CL39'INSERT THE WRAP CONNECTOR.          '
   16DC C8C540E6D5C1D740                1459
   16E4 C3D6D5D5C5C3E3D6                1459
   16EC D5C4B4040404040040              1459
   16F4 4040404040404040                1459
                    16FA 1460 MSG2B  EQU   *-1
   16FB D7C5D9C6D6D5C4D440 1721 1461 MSG2   DC    CL39'PERFORM SYSTEM RESET AND START.      '
   1703 E2E8E2E3C5D440D9                1461
   170B C5E2C5E34CC1D5C4                1461
   1713 40E2E3C1D9E34B40                1461
   171B 4040404040404040                1461
                                        1462
   1722 C9D5E2C5D9E340E6 173D 1463        DC    CL28'INSERT WRAP CONNECTOR       '
   172A D9C1D740C3D6D5D5                1463
   1732 C5C3E3D6D5404040                1463
   173A 40404040                        1463
   173E 40D5D6E3C5C6C040 1758 1464 UP3741 DC    CL27' NOTE - CPU MAY DROP POWER.'
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   1746 C3D7E440D4C1E840       1464
   174E C4D9D6D740D7D6E6       1464
   1756 C5D94B                 1464
   1759 C9C640E2D66B40E3 1785  1465 IFSO   DC    CL45'IF SO, TURN POWER BACK ON AND RELOAD PROGRAM.'
   1761 E4D9D540D7D6E6C5       1465
   1769 D940C2C1C3D240D6       1465
   1771 D540C1D5C440D9C5       1465
   1779 D3C6C1C440D7D9D6       1465
   1781 C7D9C1D44B             1465
   1786 C4D640E2E8E2E3C5 179C  1466 INTRO  DC    CL23'DO SYSTEM RESET, START.'
   178E D440D9C5E2C5E368       1466
   1796 40E2E3C1D9E34B         1466
   179D 5C5C5CC5D9D9D6D9 17A7  1467 ERS    DC    CL11'***ERROR***'
   17A5 5C5C5C                 1467
   17A8 C6E4D5C3E3C9D6D5 17B8  1468 NCD1   DC    CL17'FUNCTION REGISTER'
   17B0 40D9C5C7C9E2E3C5       1468
   17B8 D9                     1468
   17B9 E2E3C1E3E4E240C2 17D9  1469 NCD2   DC    CL33'STATUS BYTE LENGTH COUNT REGISTER'
   17C1 E8E3C540D3C5D5C7       1469
   17C9 E3C840C3D6E4D5E3       1469
   17D1 40D9C5C7C9E2E3C5       1469
   17D9 D9                     1469
   17DA C9E1D640E3D9C1D5 17EB  1470 NCD3   DC    CL18'I/O TRANSFER LINES'
   17E2 E2C6C5D940D3C9D5       1470
   17EA C5E2                   1470
   17EC C4C1E3C140C1C4C4 17F7  1471 NCD4   DC    CL12'DATA ADDRESS'
   17F4 D9C5E2E2               1471
   17F8 C4C9C1C7D5D6E2E3 181D  1472 NCD5   DC    CL38'DIAGNOSTIC BYTE DATA TRANSFER REGISTER'
   1800 C9C340C2E8E3C540       1472
   1808 C4C1E3C140E3D9C1       1472
   1810 D5E2C6C5D940D9C5       1472
   1818 C7C9E2E3C5D9           1472
   181E F040F140F240F340 182C  1473 BITS   DC    CL15'0 1 2 3 4 5 6 7'
   1826 F440F540F640F7         1473
   182D 60C5C2F240C2E8E3 1836  1474 EB2    DC    CL10'-EB2 BYTE-'
   1835 C560                   1474
   1837 60C5C2F140C2E8E3 1840  1475 EB1    DC    CL10'-EB1 BYTE-'
   183F C560                   1475
   1841 F3F7F4F14CC9E240 1852  1476 NORDY  DC    CL18'3741 IS NOT READY.'
   1849 D5D6E340D9C5C1C4       1476
   1851 EE4B                   1476
   1853 F3F7F4F14CC9E240 185F  1477 BISY   DC    CL13'3741 IS BUSY.'
   185E C2E4E2E84B             1477
   1860 F3F7F4F140C2E4E2 186F  1478 BSY    DC    CL16'3741 BUSY CHECK.'
   1868 EE40C3C8C5C3D24B       1478
   1870 E2C5D5E2C540C6D6 189A  1479 IDBIT  DC    CL43'SENSE FOR THE -WRAP CONNECTOR-      ID BITS.'
   1878 D940E3C8C540C0E6       1479
   1880 D9C1D740C2D6D5D5       1479
   1888 C6C3E3D6D9604040       1479
   1890 404040C9C440C2C9       1479
   1898 E3E24B                 1479
   189E C9C440E2C5D5E2C5 18A9  1480 IDCK   DC    CL15'IC SENSE CHECK.'
   18A3 40C3C8C5C3D24B         1480
   18AA 60E6D9C1D740C3D6 18CB  1481 NOON   DC    CL34'-WRAP CONNECTOR- NOT INSTALLED.  '
   18B2 D5D5C5C3E3D6D960       1481
   18BA 40D5D6E340C9D5E2       1481
   18C2 E3C1D3D3C5C44B40       1481
   18CA 4040                   1481
   18CC 60606040C9D5E2C5 18EA  1482 HOOK   DC    CL31'--- INSERT WRAP CONNECTOR ---  '
   18D4 D9E340E6C9C1D740       1482
   18DC C3D6D5D5C5C3E3D6       1482
   18E4 D940606060404040       1482
   18EB E3C5E2E340C9D5E3 190F  1483 WRP    DC    CL37'TEST INTERFACE DRIVERS AND RECEIVERS.'
   18F3 C5D5C6C1C3C540C4       1483
   18FB D9C9E5C5D9E240C1       1483
   1903 D5C44CD9C5C3C5C9       1483
   190B E5C5D9E24B             1483
   1910 C4D9C9E5C5D961D9 1925  1484 WRPCK  DC    CL22'DRIVER/RECEIVER CHECK.'
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   1918 C5C3C5C9E5C5D940       1484
   1920 C3C8C5C3D24B           1484
   1926 E3D9C1D5E2C6C5D9 1944  1485 TRLER  DC    CL21'TRANSFER ERROR LATCH NOT RESET.'
   192E 40C5D9D9D6D940D3       1485
   1936 C1E3C3C840D5D6E3       1485
   193E 40D9C5E2C5E34B         1485
   1945 E3C5E2E340D7C1E3 1956  1486 PAT    DC    CL18'TEST PATTERN -XX-.'
   194D E3C5D9D540C6E7E7       1486
   1955 C04B                   1486
   1957 E2C5E340C1D5C440 1977  1487 HD04A  DC    CL33'SET AND RESET READ/WRITE DRIVERS.'
   195F D9C5E2C5E240D9C5       1487
   1967 C1C461E6D6C9E3C5       1487
   196F 40C4D9C9E5C5D9E2       1487
   1977 4B                     1487
   1978 C1C3E3C9E5C1E3C5 1991  1488 HD04B  DC    CL26'ACTIVATE I/O SELECT LINES.'
   1980 40C961D540E2C5D3       1488
   1988 C5C3E340D3C9D5C5       1488
   1990 E24B                   1488
   1992 C5D5C440D6C640E3 19B5  1489 HD05   DC    CL36'END OF TRANSFER -EOT- SEQUENCE TEST.'
   199A D9C1D5E2C6C5D940       1489
   19A2 60C5D6E36040E2C5       1489
   19AA D8E4C5D5C3C540E3       1489 *
   19B2 C5E2E34B               1489
   19B6 C961D640E3D9C1D5 19D2  1490 UNSET  DC    CL29'I/O TRANSFER LINES NOT RESET.'
   19BE E2C6C5D940D3C9D5       1490
   19C6 C5E240D5D6E340D9       1490
   19CE C5E2C5E34B             1490
   19D3 C961D640E3D9C1D5 19F0  1491 STRC   DC    CL30'I/O TRANSFER LINE SENSE CHECK.'
   19DB E2C6C5D940D3C9D5       1491
   19E3 C540E2C5D5E2C540       1491
   19EB C3C8C5C3D24B           1491
   19F1 E6D9C9F3C540C4D9 1A03  1492 WDRIV  DC    CL19'WRITE DRIVER CHECK.'
   19F9 C9E5C5D940C3C8C5       1492
   1A01 C3D24B                 1492
   1A04 D9C5C1C440C4D9C9 1A15  1493 RDRIV  DC    CL18'READ DRIVER CHECK.'
   1A0C E5C5D940C3C8C5C3       1493
   1A14 D24B                   1493
   1A16 C961D640E2C5D3C5 1A26  1494 IOSLT  DC    CL17'I/O SELECT CHECK.'
   1A1E C3E340C3C8C5C3D2       1494
   1A26 4B                     1494
   1A27 C5E5C5D540D7C1D9 1A38  1495 DISCK  DC    CL18'EVEN PARITY CHECK.'
   1A2F C9E3E840C3C6C5C3       1495
   1A37 D24B                   1495
   1A39 C7D640E3D640F3F7 1A5A  1496 MAPSS  DC    CL34'GO TO 3741 MAPS, PAGE 000 ENTRY 0.'
   1A41 F4F140D4C1D7E26B       1496
   1A49 40D7C1C7C540F0F0       1496
   1A51 F040C5D5E3D9E840       1496
   1A59 F04B                   1496
   1A5B E3C5E2E340D9C5E2 1A83  1497 HD07   DC    CL41'TEST RESET OF I/O TRANSFER LINES 1 AND 3.'
   1A63 C5E340D6C640C9E1       1497
   1A6B D640E2D9C1D5E2C6       1497
   1A73 C5D940D3C9D5C5E2       1497
   1A7B 40F140C1D5C440F3       1497
   1A83 4B                     1497
   1A84 C961D640E3D9C1D5 1AA3  1498 ONOTS  DC    CL32'I/O TRANSFER LINE X RESET CHECK.'
   1A8C E2C6C5D940D3C9D5       1498
   1A94 C540E740D9C5E2C5       1498
   1A9C E340C3C8C5C3D24B       1498
   1AA4 E3C5E2E340D9C5E2 1AD0  1499 HD08   DC    CL45'TEST RESET OF I/O TRANSFER LINES 4, 6, AND 7.'
   1AAC C5E340D6C640C961       1499
   1AB4 D640E3D9C1D5E2C5       1499
   1ABC C5D940D3C9D5C5E2       1499
   1AC4 40F46840F66B40C1       1499
   1ACC D5C440F74B             1499
   1AD1 E2C5D5E2C540D9C5 1AE2  1500 IODIS  DC    CL18'SENSE RESET CHECK.'
   1AD9 E2C5E340C3C8C5C3       1500
   1AE1 D24B                   1500
   1AE3 C5D6E340C3C8C5C3 1AEC  1501 EOTACT DC    CL10'EOT CHECK.'
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   1AEE D24B                    1501
   1AED D7C5D9C6D6D9D440 1B1D 1502 HD06   DC    CL49'PERFORM END OF TRANSFER -EOT- USING I/O SELECT 3.'
   1AF5 C5D5C440D6C640E3        1502
   1AFD D9C1D5E2C6C5D940        1502
   1E05 60C5D6E36040E4E2        1502
   1B0D C9D5C740C961D640        1502
   1B15 E2C5D3C5C3E340F3        1502
   1B1D 4B                      1502
   1B1E C5D6E340E2C5D8E4 1B30 1503 EOT    DC    CL19'EOT SEQUENCE CHECK.'
   1B26 C5D5C3C540C3C8C5        1503
   1B2E C3D24B                  1503
   1B31 E4E2C540D9C5C1C4 1B62 1504        DC    CL50'USE READ/WRITE CALL TO RESET I/O TRANSFER LINES 3 '
   1B39 61E6D9C9E3C540C3        1504
   1B41 C1D3D340E3D640D9        1504
   1B49 C5E2C5E340C961D6        1504
   1B51 40E3D9C1D5E2C6C5        1504
   1B59 D940D3C9D5C5E240        1504
   1B61 F340                    1504
   1B63 C1D5C440F44B     1B68 1505 HD09   DC    CL6'AND 4.'
   1B69 E3C5E2E3A0C1C2C9 1B9C 1506        DC    CL52'TEST ABILITY OF I/O TRANSFER LINES 3 AND 5 TO RESET '
   1B71 D3C9E3E8A0D6C6A0        1506
   1B79 C961D640E3D9C1D5        1506
   1B81 E2C6C5D940D3C9D5        1506
   1B89 C5E240F3A0C1D5C4        1506
   1B91 40F540E3D640D9C5        1506
   1B99 E2C5E340                1506
   1B9D C961D640C4C9E2C3 1BB1 1507 HD0A   DC    CL21'I/O DISCONNECT LATCH.'
   1BA5 D6D5D5C5C3E340D3        1507
   1BAD C1E3C3C84B              1507
   1BB2 E4E2C540C961D640 1BE0 1508        DC    CL47'USE I/O TRANSFER LINES 1 AND 2 TO GENERATE END '
   1BBA E3D9C1D5E2C6C5D9        1508
   1BC2 40D3C9D5C5E240F1        1508
   1BCA 40C1D5C440F240E3        1508
   1BD2 D640C7C5D5C5D9C1        1508
   1BDA E3C540C5D5C440          1508
   1BE1 D6C640E3D9C1D5E2 1BF2 1509 HD0B   DC    CL18'OF TRANSFER -EOT-.'
   1BE9 C6C5D9A060C5D6E3        1509
   1BF1 6C4B                    1509
   1BF3 E2C5E2E340C1C2C9 1C23 1510        DC    CL49'TEST ABILITY TO LATCH I/O TRANSFER LINES 3, 4, 6 '
   1BFB D3C9E3E840E3D640        1510
   1C03 E3C1E3C3C840C9E1        1510
   1C0B D640E3D9C1D5E2C6        1510
   1C13 C5D940D3C9D5C5E2        1510
   1C1B 40F36B40F46B40F6        1510
   1C23 40                      1510
   1C24 C1D5C440F74B     1C29 1511 HD0C   DC    CL6'AND 7.'
   1C2A C5D5C440D6C640E3 1C41 1512 MS5A   DC    CL24'END OF TRANSFER CHECK.'
   1C32 D9C1D5E2C6C5D940        1512
   1C3A C3C8C5C3D24B4040        1512
   1C42 C5D5C440D9C5E2C5 1C59 1513 MS5B   DC    CL24'END RESET CHECK - 0.'
   1C4A E340C3C8C5C3D240        1513
   1C52 6040F04B40404040        1513
   1C5A C961D640C4C9E2C3 1C71 1514 MS5C   DC    CL24'I/O DISCONNECT CHECK.'
   1C62 D6D5D5C5C3E340C3        1514
   1C6A C8C5C3D24B404040        1514
   1C72 C5D5C440D9C5E2C5 1C89 1515 MS5D   DC    CL24'END RESET CHECK - 1.'
   1C7A E340C3C8C5C3D240        1515
   1C82 6040F14B40404040        1515
   1C8A C9D5E3C5D9E4D7E2 1CA1 1516 MS5E   DC    CL24'INTERUPT PENDING CHECK.'
   1C92 40D7C5D5C4C9D5C7        1516
   1C9A 40C3C8C5C3D24B40        1516
   1CA2 C5D5C440D9C5E2C5 1CB9 1517 MS5F   DC    CL24'END RESET CHECK - 2.'
   1CAA E340C3C8C5C3D240        1517
   1CB2 6040F24B4C404040        1517
   1CBA C4C9E2C3D6D5D5C5 1CD1 1518 MS5G   DC    CL24'DISCONNECT DRIVER CHECK.'
   1CC2 C3E340C4D9C9E5C5        1518
   1CCA D540C3C8C5C3D24B        1518
   1CD2 C1E3E3C1C3C8D4C5 1CE9 1519 MS5H   DC    CL24'ATTACHMENT DRIVER CHECK.'
```


4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   1CDA D5E340C4D9C9E5C5        1519
   1CE2 D940C3C8C5C3D24B        1519
   1CEA C961D640C4C9E2C3 1D0D 1520 PSDIS  DC    CL36'I/O DISCONNECT LATCH FAILS TO RESET.'
   1CF2 D6D5D5C5C3E340D3        1520
   1CFA C1E3C3C840C6C1C9        1520
   1D02 D3E240E3D640D9C5        1520
   1D0A E2C5E34B                1520
   1D0E                  1D68 1521 PRT    DS    CL51                PRINT FIELD.
   1D69 40               1D69 1522        DC    XL1'40'             CLEARING BYTE.
```

4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1524 ***********
                         1525 * EQUATES *
                         1526 ********************************************************************************
                    0008 1527 ARR     EQU   X'08'
                    0216 1528 LINK    EQU   X'216'
                    021A 1529 PRINT   EQU   X'21A'
                    1A38 1530 PRCK    EQU   DISCK
                    0001 1531 XR1     EQU   X'01'
                    0002 1532 XR2     EQU   X'02'
                    0222 1533 HALT    EQU   X'222'
                    0080 1534 SSW10   EQU   X'80'
                    020A 1535 SBYTE2  EQU   X'020A'
                    0A07 1536 FRTN    EQU   X'0A07'
                    164E 1537 DADATA  EQU   WORK-8
                    16CC 1538 H0008   EQU   H0885-1
                    1656 1539 SNSOC   EQU   WORK
                    1699 1540 H0000   EQU   N000
                    169B 1541 H0001   EQU   N001
                    169D 1542 H0002   EQU   N002
                    16A1 1543 H0004   EQU   N004
                    164D 1544 TEMP    EQU   TEST
                    0A11 1545         END   BEGINN
```


4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

CROSS-REFERENCE

```
SYMBOL  T LEN VALUE DEFN  REFERENCES
ACT     A 002 143B  1231  1079* 1081 1245 1249 1254 1258 1373* 1377 1379
ALTER   A 004 0A43  0046  0043
ARR     C 001 0008  1527  1098 1138 1141 1144 1163 1180 1200* 1201 1203* 1204 1206* 1207
                          1233 1287* 1288 1291* 1292 1334
BEGIN   A 001 0A0D  0024  0017
BEGINN  A 001 0A11  0028  0059 1545
BISY    A 013 185F  1477  1125
BITS    A 015 182C  1473  1074 1365 1366
BITSNF  A 004 14DE  1287  1080 1376
BSY     A 016 186F  1478  0824
BTNF    A 004 133A  1313  1292*
BUSY    A 004 1352  1122  0072 0282
CAA     A 002 16D1  1452  0134
CKIT    A 004 1563  1337  1386
CKOUT   A 004 163C  1387  1340
CKPAT   A 004 13ED  1200  0473
CKS     A 005 140D  1209  1220
CMPARE  A 004 143C  1233  1084 1382
CMPR    A 004 1494  1262  1233*
CSS     A 002 16D3  1453  0188
DACATA  A 001 164E  1537  1451
DAMBSY  A 004 1080  0821  0833
DATA    A 002 16CF  1451  0080
DISCK   A 018 1A38  1455  0758 1530
DCDC    A 006 0AF1  0115  0119
EB1     A 010 1640  1475  1072 1363
EB1T    A 001 14DD  1285  1290* 1305
EB2     A 010 1836  1474  1362
EB2T    A 001 14DC  1284  1298
EOT     A 019 1830  1503  0470 0934
EOTACT  A 010 1AEC  1501  0532
EPRNT1  A 004 136C  1128  0107 0109 0111 0114 1073 1082 1364 1378
EPRNT2  A 004 1377  1141  1071 1075 1085 1360 1367 1383
EPRNT6  A 004 1382  1144  0116
ERDTR   A 004 0BD0  023E  0209
ERMS    A 002 1421  1215  1211*
ERMSOS  A 001 1687  1411  0475
ERROR   A 004 1558  1334  0091 0163 0225 0242 0326 0345 0362 0379 0449 0477 0535 0606
                          0693 0761 0786 0871 0937
ERS     A 011 17A7  1467  1083 1361
ER0A    A 004 10F1  0EE5  0849 0858
ER0B    A 004 1179  0931  0913 0923
ER0C    A 004 1289  1065  0993 1000 1009 1016 1025 1032 1041 1048
ER0S    A 005 0DA9  0463  0423 0425 0427
ER0SA   A 004 0D80  0443  0435 0437
ER0SA   A 004 0FFB  0755  0734
ER0SB   A 006 101F  0772  0740
ER0SC   A 006 1031  0776  0748
ER4A    A 004 0C7D  0322  0286
ER4C    A 004 0CC5  0356  0298
ER4E    A 004 0CE9  0373  0311
ER44    A 004 0CA1  0339  0292 0304 0316
ER7A    A 004 0EA6  0595  0578
ER7B    A 004 0EB1  0598  0587
ER8B    A 004 0F59  0676  0651
ER8D    A 004 0F68  0681  0660
ER8F    A 004 0F73  0685  0669
EXPY    A 001 1656  1400  0474
FRTN    C 001 0A07  1536  0041*
HALT    C 001 0222  1533  0047 0098 0117 0170 0232 0249 0335 0352 0369 0386 0459 0490
                          0542 0613 0700 0768 0793 0828 0878 0944 1061 1088 1118 1129
HD0A    A 021 1881  1507  0812
HD0B    A 018 18F2  1509  0897
HD0C    A 006 1C29  1511  0963
HD04A   A 033 1577  1467  0268
HD04B   A 026 1991  1488  0274
```

4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
HD05	A	036	19BE	1489	0405
HD06	A	049	1B1D	1502	0510
HD07	A	041	1A83	1497	0562
HD08	A	045	1AD0	1499	0633
HD09	A	006	1B68	1505	0720
HFC04	A	002	16C9	1448	0739 0772
HFC55	A	002	16B7	1439	0285
HFE00	A	002	16CB	1449	0747 0776
HFFF8	A	002	16B3	1437	1189
HFSAA	A	002	16B9	1440	0150
HOOK	A	031	18EA	1482	0110
HPLXX	A	002	0A4C	0048	0042 0044* 0046*
H00FF	A	002	16C1	1444	0729
H0000	A	002	1699	1540	0078 0079 0103 0211 0572 0581 0730 0817 0841 0845 0854 0909 0919 0984 0988 1004 1020 1036 1100 1101
H0001	A	002	169B	1541	0571 0918
H0002	A	002	169D	1542	0908
H0004	A	002	16A1	1543	0580 0844 0987
H0008	A	002	16CC	1536	1803
H0010	A	002	16C3	1445	0853
H002C	A	002	16B5	1435	0971 0974
H0020	A	002	16A5	1430	1019
H0040	A	002	16B1	1436	1035
H0080	A	002	16A7	1431	0877 0983 1027 1043 1099
H0082	A	002	16PE	1441	0429 0521 0925
H01A0	A	002	16AF	1435	1002
H0188	A	002	16BD	1442	0570 0641
H0180	A	002	16A0	1434	0995 1011 1018 1034
H0190	A	002	16AB	1433	0585
H0882	A	002	16BF	1442	0728
H0880	A	002	16A9	1432	0973
H0885	A	002	16CD	1450	0840 1538
H3080	A	002	16C7	1447	0906 0916
H3082	A	002	16C5	1446	0905 0915
IDBIT	A	043	189A	1479	0067
IDCK	A	015	18A9	1480	0089
IFSO	A	0A5	1785	1465	
INITL	A	004	131D	1098	0145 0200 0276 0408 0613 0365 0636 0723 0815 0835 0900 0966
INTL	A	004	1334	1104	1098*
INTRO	A	023	179C	1466	0115
IODIS	A	018	1AE2	1500	0446
ICSLT	A	017	1A26	1494	0376
ITON	A	004	152E	1209	1306
ITSON	A	004	1518	1202	1299
LINE	A	001	138E	1148	1135* 1142* 1145*
LINK	C	001	0216	1528	0084 0100 0154 0172 0215 0234 0251 0318 0337 0354 0371 0388 0439 0461 0492 0525 0548 0591 0615 0672 0702 0751 0770 0795 0830 0861 0880 0927 0946 1050 1063 1090 1120 1131
LSIOC	A	001	0000	0005	
MAPS	A	004	139C	1163	0096 0168 0230 0247 0323 0350 0367 0384 0457 0469 0540 0617 0698 0766 0791 0826 0878 0942 1059 1086 1116 1127
MAPSS	A	034	1A5A	1456	1165* 1166* 1167* 1168* 1172
MP07	A	002	0ED2	0612	0596* 0599*
MP08	A	002	0F94	0659	0678* 0682* 0686*
MP09	A	002	1058	0792	0774* 0778*
MSG1	A	039	16FA	1459	0031 0032
MSG1B	A	001	16D3	1458	0031
MSG2	A	039	1721	1461	0036 0037
MSG2B	A	001	16FA	1460	0036
MS5A	A	024	1C41	1512	1412
MS5B	A	024	1C59	1513	1413
MS5C	A	024	1C71	1514	1414
MS5D	A	024	1C89	1515	1415
MS5E	A	024	1CA1	1516	1416
MS5F	A	024	1CB9	1517	1417
MS5G	A	024	1CD1	1518	1418

4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
MS5H	A	024	1CE9	1519	1419
NCD1	A	017	1788	1468	1345
NCD2	A	033	1709	1469	1348 1349
NCD3	A	018	17EB	1470	1070 1352
NCD4	A	012	17F7	1471	1355
NCD5	A	036	1810	1472	1358 1359
NCOD	A	001	159A	1333	1338* 1339 1343 1346 1350 1353 1356
NF	A	004	151C	1303	1295* 1300* 1301 1302* 1316*
NFF	A	004	1532	1310	1296* 1307* 1308 1309* 1317*
NOON	A	034	18C5	1461	0108
NORDY	A	01E	1852	1476	1114
NTRDY	A	004	1338	1111	0104 1103
N000	A	002	1695	1424	1540
N001	A	002	1698	1425	1200 1206 1287 1291 1385 1387 1541
N002	A	002	1690	1426	1203 1218 1269 1270 1316 1317 1368 1371 1542
N003	A	002	169F	1427	1183
N004	A	002	16A1	1428	1543
N006	A	002	16A3	1429	1217
ONOTS	A	032	1AA3	1498	0595* 0598* 0803 0677* 0581* 0685* 0691 0773* 0777* 0783
PARITY	A	004	129F	1054	0978 0981
PAY	A	010	1956	1486	0134* 0143 0188* 0198
PATCH	A	004	1434	1221	1207* 1216
PRCK	A	01B	1A38	1530	1057
PRINT	C	001	021A	1529	0069 0034 0064 0076 0135 0140 0158 0189 0195 0219 0236 0265 0271 0322 0339 0356 0573 0402 0443 0467 0507 0529 0559 0600 0639 0689 0717 0755 0780 0809 0821 0865 0894 0931 0960 1054 1065 1111 1122 1147 1169 1212
PRNT	A	004	138A	1147	1140 1142
PRT	A	091	1065	1521	0028* 0039 0039* 0105* 0106 0106* 0106* 0110* 0112* 0113 0113* 0115* 0704 1072* 1074* 1077 1083* 1150 1151 1151* 1742 1342* 1345* 1348* 1349* 1352* 1355* 1358* 1359* 1362* 1363* 1365* 1366* 1374 1375 1381*
PRTT	A	004	1398	1152	1138* 1141* 1144*
PRTSS	A	004	0F7B	0628	0679 0683
OS	A	004	1304	1184	1180* 1183* 1187 1188 1190
OST	A	004	1306	1186	1182
OUTS	A	004	13C3	1186	0074 0147 0202 0278 0410 0515 0767 0638 0725 0837 0902 0968
RDRIV	A	018	1A15	1493	0325
RSDIS	A	036	1000	1520	0858
RTN0A	A	001	1064	0805	0715
RTN0B	A	001	1115	0850	0507
RTN0C	A	001	119D	0956	0692
RTN01	A	001	0A51	0060	0026 0040
RTN02	A	001	0805	0130	0062
RTN03	A	001	0862	0184	0132
RTN04	A	001	08F4	0261	0186
RTN05	A	001	0D0D	0398	0263
RTN06	A	001	0DF1	0503	0400
RTN07	A	001	0E47	0555	0505
RTN08	A	001	0EDD	0626	0557
RTN09	A	001	0F9F	0713	0628
SBYTE2	C	001	020A	1525	1181
SHDPSY	A	003	109A	0832	0819
SKPFR	A	004	162C	1383	1380
SNSAA	A	002	1103	0874	0846* 0848 0648 0855* 0857 0857
SNSFB	A	002	118B	0940	0910* 0912 0912 0920* 0422 C922
SNSET	A	002	0BBE	0226	0212* 0214 0214
SNS0C	A	001	165E	1539	0989* 0991* 0992 0996* 0998* 0999 1005* 1007* 1008 1012* 1014* 1015 1021* 1023* 1024 1028* 1030* 1031 1037* 1039* 1040 1044* 1046* 1047 1078 1079
SNS01	A	002	0AA1	0094	0082* 0083 0083 0102* 0103
SNS02	A	002	0B50	0166	0151* 0153 0153
SNS03	A	002	0BE2	0245	0206* 0208 0208
SNS4A	A	002	0C8F	0331	0283* 0285 0285
SNS4C	A	002	0CD7	0365	0295* 0297 0297
SNS4E	A	002	0CFB	0382	0306 0310 0310
SNS44	A	002	0CB3	0348	0289* 0291 0291 0301* 0303 0303 0313* 0315 0315

4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SNS5A	A	002	0DDF	0486	0415* 0419* 0422 0422 0463
SNS5B	A	002	0DDA	0483	0416* 0420* 0424 0424 0464
SNS5C	A	002	0DD5	0480	0417* 0426 0426 0465
SNS5D	A	002	0D92	0452	0432* 0434 0434
SNS5E	A	002	0D97	0455	0431* 0436 0436
SNS6	A	002	0E38	0538	0520* 0522* 0524 0524
SNS77	A	002	0ECB	0609	0574* 0575* 0577 0577 0583* 0584* 0586 0586
SNS8B	A	002	0F8D	0696	0643* 0645* 0647* 0648* 0650 0650 0654* 0656* 0657* 0659 0659 0663* 0665* 0666* 0668 0668 0676*
SNS9A	A	002	100D	0764	0731* 0733 0733
SNS99	A	002	1051	0789	0737* 0739 0745* 0747 0772* 0776*
SPECL	A	004	0AB3	0102	0070
SSW10	C	001	0080	1534	1181
STRC	A	030	19F0	1491	1068
TAERR	A	004	14CC	1273	1234* 1246 1250 1269*
TA1	A	004	1471	1249	1238* 1244 1263 1263*
TA2	A	004	1467	1245	1237* 1264 1264*
TA3	A	004	1460	1243	1236* 1265 1265* 1271
TBERR	A	004	14D4	1275	1235* 1255 1259 1270*
TB1	A	004	1489	1258	1241* 1253 1261 1256 1266*
TB2	A	004	147F	1254	1240* 1267 1267*
TB3	A	004	1478	1252	1239* 1247 1268 1268* 1274
TC	A	004	1490	1261	1256 1276
TERP	A	001	164D	1544	1163* 1164
TEST	A	001	164D	1354	0463* 0464* 0465* 0972* 0975* 0977 0980 1209 1544
TNF	A	004	150A	1298	1293* 1312 1314 1314* 1316
TNFF	A	004	1520	1305	1294* 1315 1315*
TRLER	A	031	1944	1485	0222
TRY	A	004	1425	1217	1210
UNSET	A	029	19D2	1490	0342
UP3741	A	027	1758	1464	
WDRIV	A	C19	1A03	1492	0359
WORK	A	001	165E	1395	1076 1537 1539
WRP	A	037	190F	1483	0138 0192
WRPCK	A	022	1925	1484	0161 0239
XPT	A	002	1439	1230	1078* 1243 1252 1370* 1379
XR1	C	001	0001	1531	0040* 0041 0306* 0308 1077* 1164* 1165 1166 1167 1168 1173 1188* 1189 1202* 1209 1217* 1219 1235 1296 1335* 1337 1368* 1369 1371* 1372 1375* 1384* 1385* 1387* 1388
XR2	C	001	0002	1532	1076* 1205* 1211 1218* 1234 1295 1374*
XYR1	A	006	1601	1373	1384

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

OBJECT CARD LISTING

THE CHARACTER ° INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

```
°GBK GBD °°PN 55 58422 EC 824870 3741 ATT TEST WI TH WRAP CONNECT. 84@@84@@ °°°°°°°° °°°°°°°° 40210000
T+←Y:ŁED °°Ł E-7 ""4AŁ °D BVG /OH ĒŁK*O=UC-OH*BF-Q XE2D8ŁA5ZCEY}EA5 ZO-DHML£AB-#'Ł8 Z <ŁYD Ł3M40210001
T+←Z5A33-BU32/9Ł @86Z<OH*BHUC/UH* HDŁD B0P /OHEJK% Q%UE/OM H%"( C*E BD5. /1|CŁCO@<MD 0Z3D D#Q40210002
T+←D0JJER<MHOWLE DE%Ł0Ł0D/CŁDHYŁD ~OHDBE%B9 /.BC1S ZŁŁC /1N$ "U °°° C "CH*LXIBJOH*BHU -OH* J8Ł40210003
T+←.. /00Ł0D/CŁD OWŁD/0 DL÷C1*GK@ <HA4>GK* /1(%CBD ).1T.OH*L$ O;GK0 Q:%BGD60@PA4?CB ).74 *I440210004
T+←%%.ŁBGDŁ0<E/4 UE93 /1÷B0H*BHUC S0H*HØŁH ŁŁH< JV ME_Ł /OHEŁKMRC4B S0H*BF-MKFN$ /1< )0H* 72B*0210005
T+←_/0@|0|C01JJE 9<D<.M 4AB5 .L%@ A /$ /OHEO/QRIM /0H*ND0|9D- "BB GD92JQ*BG SI H*B G /0 3JŁ40210006
T+←>* 0 .* CAFN8 04@BG /ZAIJU|5H| /OHEAJHRN%BGC17 /1|C@C0@<MMO_3A CB=H( Ł?SB=C2 LQ 1JJQ 5T*40210007
T+←?PWLACE#B( Ł> =B#3 -ŁHOOH*BF%H ¬FMJ H@BGEN%C=Ł °°|" /1+*UR. /OH SŁ8| /OHOOH*BF%H OFKM 0.Y40210008
T+-0KŁ8. /1N$ "5 N °C"OH*LXIFJOH* BHU S0H*EE-Ł CŁ7 /OHEŁKDR)4BU0H* BF-MEFRG /1<)0H* L0" °L:*40210009
T+-1(|C33ŁŁCAŁ/( K<D<<T0*ACH@<T¬H AN|( ECACC.<(( Ł2 3C.G2 0T3Ł- 0Ł03 PCŁD<503N@-E@@4 H<D< RCU40210010
T+-2HC.<(( Ł23C.G 2 MTB Ł3#@4|8*D< CŁD<=039Ł-E'<Ł< <%04AC.<<%¬HAH<B G /$ /OHEO/HEEM U0H* L/440210011
T+-3CEN%C"Ł °°° |" /1+*UTG /OHSŁBL /OHD0H*BF%H)F)I I@BGEN%C=Ł °°° |" /1+*UU. /OHSŁB¬ /OH K1U40210012
T+-3=E%BG /.BD1Y CŁBP /1N$ "@ °°° C "0H*LXIH20H*EHL VOH*BE%BG /.BDJY W6B$ /1N$ "X8 °° C "0H* #-B40210013
T+-49D92KŁ*BG SI I%BG /0E °° 710H* EFUMUF$N Z*BGD17 /1|CŁC0ŁŁ4DEB4< B<DM(73ABC)Y0Ł07 N| °°° M Ł40210014
T+-54C)@@ °° 7ECŁD (707)@-E-CŁD(6-7 QD-EPCŁD(5Ł7L@-E +<MDO>"( CLABCR* 0JŁŁKCŁD(U-6Ł@-D (CŁD 3.D40210015
T+-67(R*(V¬HAA<B G /$ /OHEO/HEBU ZOH*NDOM °°°°°° YD °°° C"0H*LXI20H* BHU ZOH*BE-0AEUU (700 ;H040210016
T+-7D °JR.C)Y< °JR (C)P /OHEO/<$<D YOH*L#JRDEY¬ /1N $ °"UE °°° BBŁ °°°° M H °°°° "E5GD92K**B G SH @D040210017
T+-8VŁBT /OHOA- ° +K%BG /ZE<J%)ŁH$ /1<)0H%LO" @||( AA¬(CACAECT-1ŁJE #| °° ++ 4ACT-+(%B A /Q 5HD40210018
T+-9-0H*BF%HF>1 °M%BGEN%EB °°°° |" /1+*U1G /OHSŁE. °/C1OAC +7*BG /Z EHJDCŁH¬ /1<)0H* L0" °:L-40210019
T+-:%|C01ŁJE*<MM OW3EEEZX3Ł1 0Ł0# .<D<+204AC%%+2¬H AH3EEEDD1JJER8<4< Ł<D<+23ACC%%( Ł# .C%U 1YQ40210020
```

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-#D@-DK&4 (OH*	BET31FZQ# &#K@Y*	H|\<ĒVTYAC_. /OH	ĒOS ĒY4 >OH*NOO|	9 "@BGD92LD%B	G SH $BU40210021
T+-@J&B@ /OHOB	|X@BG /ZE.J.&ĒHT	/1<)OH*LO" @|CE	AE.73&1 0&0=(@4<	H<D<|T¬(CDCACC84	0&0@ ĒAU40210022
T+-*<T&4AC84|S"H	A|¬(CHCACC873&1	0&0=(<D<|T&4AC&4	|S"HA<¬(C&CACC87	3&1 0&0=(<D<|T&4	AC84 8YY40210023
T+-=GC&72 KG3& 7	/OHO| Y|TC34FZQ	@E =H@Y*L||ĒVTO	NC9L2/O-8*1D̄O|AQ	|V<BG /,8HADT&B#	/1H :0D40210024
T+-"BCC|9 "8B	ED92L <BG SI .%B	G /QI AATOH*BFUH	8F&/ D*BGD17 /1|	C@C0@<MDO73EEE%D	1JJQ :-040210025
T+-"'WLACD 4(J	(D 72 K.3&& 0&1A	JC&D&MJSI&-D=84	H&4H <D<&M&4ADED	02"HA|¬(C*BG /$	/OH 03<40210026
T+/ 8F%H-KFT/ .@B	GEN%C= 0 |" /1+	*U3G /OH5&B" /CH	CC D&MA$||&ĒVT%	ADET /1 "C D&MA$	.||< 6H 40210027
T+/A3FZQ: JAQOH*	BF%H-FD(<<BGEN%	C |" /1+*U3.	/OH$&CC /OH0B-	JE*BG /ZEKJ>16H.	/1< N@440210028
T+/B>GLEAEZX3&&C	A&/BĒOH*BF%H&FF'	(*BGD92LN*BG SI	(*E€ /$3& 7A&/B	0H*LG*BGD@|0|C0	16JQ)B@40210029
T+/CZ3LEEEZX3&&C	3&0&1JJĒ/<MMOWLA	CD&<(JDCD&G2 K.	3&&C3&0&1JJ$C<MM	OWLACD&<(JDCD&G	2 $* @Q840210030
T+/CU&4 (OH*BE%B	G /.BIA4(&CG /1N	$ "- C"CH*LXI(	J0H*BHU 10H*BE¬%	DR7 /OHĒJMD$@UB	.0H* @CD40210031
T+/E¬C17 /1|C@C0	@<MDO1LEAE%¬36-D	1JJĒ)<MMC%LAED(%	(JF.D0X2 K%16J$	E<MDO1"(A LEEFZ%	1JJQ M:&40210032
T+/FĒWLAED0%(JF	.D0X2 &%16JĒ#@4	(0H*BE%E€ /.BD1%	0&C. /1N$A&- C	"0H*LXI(K0H*BHU	20H* 3RD40210033
T+/GN /O< |""0H*	BFUM7GBV .<BGD17	/1|C@C0&<MMO_LA	CEU41&JĒZ<MMO_LA	CEUX9 JR<DZC++ D	0K?H 4H%40210034
T+/H&U<*1&JĒX<MM	OWLEAED?3&1 1JJĒ	/<MMOWLACEVQ@A/R	M|&CCN?HA>3EAED4	0&1RC| ONC4 EV$	2 Ē- 9 U40210035
T+/I.<MDO.3EEE%0	1JJĒR<D<DNT0HEV&	'8/RO@-F(<MDC.LA	CEV&@ AR#|& ON?H	A:TEAED41JJĒV<MM	OWL 1HH40210036
T+/HF&1RO|BHONC4	SEV$2 N@1&JĒX<D<	ONTO EV&' ARO@-E	<<MDC.LEEE.D1JJĒ	R<D<DNT1BEV&'&/R	O@-D "TU40210037
T+/.A<LEAED*0&1R	O| CNC4 EV$2 J#	/OHDOH*BF%H(FT/	<&BGD92LN@BG SI	<@BG /$ /OHĒ0/8	R@D :Z440210038
T+/.B(OJGL'JP:@B	GD7*<@J44FDC /1(	%C 8)(1-%OH*L)EH	@EV$@ J47C DM+JR	MC DM+1RO0H*M7/&	#0H* 6-840210039
T+/<7DE<<B/4UE:¬	/1&@CH*L)@BGD92	LN<BG SI (<BG /C	4EA<7<MDCZ3EBEZU	1JJĒR@4 (0M L+<B	G QD@40210040
T+/(20H*BF%HKFEI	|%BGD92&**BG SI	|%BG /$ /OHĒ0-4	CP4 "0H*LXIMS0H*	BHU "0H*BET&HD9%	@-J< ":-40210041
T+/+_T?HGD3&HD9%	@-/++@Y*H(-LW32	FD8# /OHE EX)Ē 1	ĒGC-)Ē*BC 4BAR	((&DOLJ-BFU@ F <	ĒM 00Y40210042

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/|YF HEM&DQ 1Z	R *BG /DFH/Z&4H*	B(-L53S -.2D Y	+ J|PEZ" /0 |*H	B < AD*65 J|PL D	BE.< K &40210043
T+/&TOH*L5C@HEZ%	4BA|8(&D C@HEZ4	4BA&D(&H C@HEZ%	4EA&7L&MFEU72 J	% J&/ %BG /DBF	@Y* K$%40210044
T+/J;C3QAE0<6 /E	)¬¬&A0 DMC*BG	(-HV3&BE<@	4 JLP| DM@LOAEF-	@ JJ2| DM;LOAEH	@ J& 0I 40210045
T+/KRST-AECT2D Y	8 J&:&/A;@Y*G+ D	M+?H&NC-AECX2D Y	8 J&#@/A+@Y*G+ D	M+"H&JCS EH. D	C- M3H40210046
T+/LME&HM*-8 EF-	ME 8 EFDMQ&8 FMY	MS-8 EH M- 8 EGU	M;&@AE<@CX&@AE(*	CX*B€EF @P OH*	M;C0 =#<40210047
T+/M|P OH*MU (--C@3&HE+%< JL	1 < JL) 6EAE	$(-N|LOAE&%@ JM	/(HNG3&AELM8 AL	*@/ =:M40210048
T+/NHA330EJ72/0& (JM3|| C- E(7	2D *@@AM3BY*D||C	N<30 8-AH.0A	8 E&%NB08 EKD	NH&@ LHY40210049
T+/CE JM¬EZ4| JM	5EZ7 /1MH C&HEO.	B & (DN$ 0 EAY	C7"EN.2-*-<O/5	YGOU" JNE@-DFCA	)&J* 7 M40210050
T+/P >C4BEN.2 &0	<B/45E&<<C15<E'&	(11:E@-DFCAD)&/¬	.|&&NO?HAA-0.GL8	P*34EEN.2 &0<C/4	7F Q 9/D40210051
T+/P#CA ?LA-Q0H*	L)00IGL$Q(-0IGM-	0&<BGD6@<C/47FE0	<C/5.FB3 /1(7(-D	OXL&AE-—< J&9	6 JQ 3.440210052
T+/C6XL&AE-Q< J&	# CE /470-D)K&8	CE(8M+@BGDE0(J&	5EC72-&Y<B/4UE:¬	/1&@0H*L)3MAE-Q	6 JQ @$*40210053
T+/R1*&E&E0<6 JĒ	$(DCJ@BG		C HD "& C <D "@	+D =& . +D "&H	H <D J@H40210054
T+/Ē% |UB CA |U	B C/ |U B C/ |U	B"11AGEU**J21GĒD	#>J3JG+U A H	0 D Q H B BH	AU D ;RM40210055
T+/$X- F- DC"=	X"NP9D-BB $-H%-C	" A 0-T8 " L= S	EEU#A0¬P52)PS1)X	T&+|H1MCW6*GP&<|	O5)M 3A-40210056
T+/*S1*|TS_V.&DA	&DA &DA &DA &(¬	E6*$06)J &>TS8@P	M&(XE8%PT&<GN1DC	S8@GR84_ &DA &DA	&<U RB-40210057
T+/))5;.E&:(9_X	A54CC&_PN1*|TS_V	&DA &DA &(PO8&N	@DCC5=J 5<GY&<L	RS_) 5*$W1)V.2*R	8_Q 5YQ40210058
T+/;ŌE4CT9(XN&(¬	09%PR&<.A0'I 5_N	0)PD&(XE4*$A1CC	P6)$G6*GMK@LO&+.	Y8>|E5DCR1:.E86_	3>/ >B440210059
T+/¬LC)XTK51*P<P	R6)$RPE1*1>LNO=|	I5_N 6*PE2;.T1)X	SE$GT9+1 0>TT1MC	L1)PG8@/ 0*$U5:(	6*M MC040210060
T+/-+1&XS8@PR2OG	O&+|R0)PS1%PR&(|	I5*PS1<GTOMCA1<L	R1:.51<XA1*POE>|	I04CB:+|E&<LA8@E	8*U *#@40210061
T+//I0)FS1%PR&(X	E1&XS8@PR@DC1&|I	@4C4&|N *UC7Q<P	@@LC@:+|EQFCE07E	0>TT10C3*"L1&<X	S&(M P/Q40210062
T+/SD5>(6*PA1+/	.@"¬4@MCI8UCE9+.	YK"|7*|E 0>LS:DC	C2<PC4U7S1)PS1MC	F5_V 8@TE&FCW6*G	P&<< "JH40210063
T+/S"5_PN1*|TS_V	-&DA &DCI1DCE2:|	SK@XD&+.E5:.E&<|	H1*|KK6CW6*GP&<|	O5)PEC=|O6DA 5)$	T&<U *1Q40210064

4021 3741 ATTACHMENT TEST WITH -WRAP CONNECTOR-

OBJECT CARD LISTING

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

T+/T:5¦.T0)¦L1*J .&DA QFA-&<XN8%P R84CW6*GP&<¦O5)F E0=¦D6NA-QFA &+¦ E8>(2)PT1)XF0*¦ E&<& 1/-40210065

T+/U56*XV1)XS&<G N1DCR1*¦E2;PE6;I .1(XI9*PRQ)XE0&P I9*PR&<¦N1*¦KK=¦ R0)PS1%PR&<PR6)$ R&(< 8M840210066

T+/V00;¦C2DCN5>(6*PS1;(.8&PS84C P0;¦T1)XN&FCX5EA .&%PT&<GN1DCR1;. E84CR1*GDQ¦$R2:¦ E&<& O/<40210067

T+/W.6*XV1)XSK8G C88XV0;¦E&<V/5UC S1)¦E0=(4@XN1;I .1)FD&(¦$F&+¦RO)P S1%PR&FCE5>(-&+. E&+& RA440210068

T+/XW1)PC1MCT1;. TK@V/5UCT6*GN8%$ E6MCL2)PE8UCN5>(6*PS1;(.2DGO&+¦ R0)PS1%PR&(¦I5*N 8%M KMY40210069

T+/Y/5;.E&<¦M1*¦ KK=$R2;¦E&<LR2;P E6MCC2<PC4U?R1*G D&<LR2;PE6MCC2<P C4U?IQ)R &%PL1*¦ T&<< 5TQ40210070

T+/Z*2<PC4U?E9*P N&(¬A6*XT:DCC2<P C4U?G5UCT5UC3*ML 1&(LA5=I.&&¬A1@N @¦CO&<PN8*XY5¦A .8@M PW840210071

T+/_DP8>(6*PS1;(S%R 2DGO&+¦RO)P S1%PR&(¦I5*PS&¦E 0)FD&¦(.2DGO&+¦ R0)PS1%PR&(¦I5*N 94 **Y440210072

T+/.K6*PS1;(@BT E0*I.8@PS84CR1;. E84CO1UCIQ)R 8*X A5;.F1)V 4@XN1;I *F_ *W_ 0)PD&¦) .6%N O:840210073

T+/%(5;.E&(XE8%P T&<¦M1*¦KK@PO84C C2<PC4U?P1)XF5_X M&<PN1DCO1UCT6*G N8%$E6MA-1)$TQDC U8%U 8E%40210074

T+/_H5*) 2DGO&+. E4@PC84C3K@PO84C S1)TU1)PC1MCC2<P C4U?UE%N 6*PA1FG W6*XT1MCC0)¦L&+¦ O&(U JLM40210075

T+/>C1;.E84CIQ)R 8*XA5;.F1)V 4@X N1;I 84CA&*J *D? T1;.T&<GB2)¦I8=/ 5%R 2DGO&+¦RO)P S1%M 2.440210076

T+/>=6WCL2)PE8UC 3&<GN1DC5&+¦O&(X E8%PT&<V/5UCD2;. C5_PN1*¦T&(¦A8@¦ HK=LS1MCIQ)R 8*X A5;H 43D40210077

T+/791%PR&(¦I5*P S&¦E 0)PD&¦I 8*R 18PN1)XAE&N 1)P D&($F&+¦RO)PS1%P R&FCE5>(-K=¦E8>(0*H M2040210078

T+/042)¦I8=/ 8*R 4@UTO@/ 2DGO&+¦ RO)PS1%PR&(¦I5*P S&¦(.&¦J.&¦R 0)P D&¦).1)PD&($F&+¦ RO)M #S840210079

T+/178%$E6MCC2<P C4U_ &<PN1DCR1;. E84CC2<PC4UA-&¦A .&DA &<V/5UCD2;. C5_PN1*¦T&<¦H1*¦ KK@ "BM40210080

T+/2D&DCE5*J 6*P S1;(@BTE0*I @DC 1K4A &DC1E;¦E6;L P84CF1)PD2)PG&<¦ H1*¦KK4CE5*J 6*P S1;< PH-40210081

T+/3V&<¦M1*¦K&FA @U_ &DA 1<XS0*$ N5*PC84CCE*XV1)V CETE0*I.0;¦T0*¦ H5<PN84CD6*XV1)V 0@- P0U40210082

TI14(1*¦KK@V/5UC D2;.C5_PN1*¦T&(¦ A8@¦H&<$A2)¦S&+¦ O&(XE8%PTK) .... _ PE840210083

T A5Z& .... _. 1E 40210084

EB/E*E7*=¬DC"PH$ ="7W6F¦ 11350908741 1217455-40210085

LAST PAGE

DATE 16AUG74 15NOV74
EC NO. 824765 824870

4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                            2 *                                                   LAST CHG :08 01 74
                            3        DECK  4
                            4        SEQ   0
    0000                    5 L3742  START 0
                            6        TREP
    0A00                    7        ORG   X'A00'
                            8 ****************************************************************
                            9 *                                       SECTION PREFACE        *
                           10 ****************************************************************
    0A00 4032         0A01 11        DC    XL2'4032'              PROGRAM ID AND REVISION LEVEL
    0A02 00           0A02 12        DC    XL1'00'                SECTION FLAGS
    0A03 01           0A03 13        DC    XL1'01'                CURRENT ROUTINE NUMBER
    0A04 0000         0A05 14        DC    XL2'0000'              RESERVED
    0A06 0A0D         0A07 15        DC    AL2(BEGIN)             FIRST ROUTINE ADDRESS
    0A08 FFFF         0A09 16        DC    XL2'FFFF'              RESERVED
    0A0A 405000       0A0C 17        DC    XL3'405000'            SPUT
                           18
                           19 ****************************************************************
                           20 *                                  PROGRAM NOTES               *
                           21 ****************************************************************
                           22 *                                                              *
                           23 * ABSOLUTE ADDRESSING NOTE -
                           24 *
                           25 *      IF ANY CORRECTIONS OR MODIFICATIONS ARE MADE ON ROUTINES *
                           26 *      01 - 0E, BE SURE TO CHECK THE ADDRESSES OF LABLES -JUMP- *
                           27 *      AND -INTS-. THESE TWO ADDRESSES MUST, WHEN OR'ED TOGETHER, *
                           28 *      ( INCLUDING THEIR PARITY BITS ) CONTAIN CORRECT PARITY.  *
                           29 *      SEE THE EXPLANATORY NOTE IN ROUTINE 0E.                  *
                           30 *                                                              *
                           31 ****************************************************************
                           32
                           33 ****************************************************************
                           34 *                                                              *
                           35 *      INTRODUCTION     PROGRAM TELLS OPERATOR TO PUSH SYSTEM  *
                           36 *                       RESET TO START THE TEST.               *
                           37 *                                                              *
                           38 ****************************************************************
    0A0D 01           0A0D 39 BEGIN  DC    XL1'01'                DUMMY ROUTINE SETUP.
    0A0E 00           0A0E 40        DC    XL1'00'
    0A0F 0A51         0A10 41        DC    AL2(RTN01)
                           42
    0A11 C0 87 021A        43 BEGINN B     PRINT                  PRINT SECTION HEADING.
    0A15 42           0A15 44        DC    XL1'42'
    0A16 1E           0A16 45        DC    IL1'30'
    0A17 1A8E         0A18 46        DC    AL2(UPSIOC)
    0A19 40E0         0A1A 47        DC    XL2'40E0'
    0A1B C0 87 021A        48        B     PRINT                  PRINT OPERATOR INSTRUCTIONS.
    0A1F 06           0A1F 49        DC    XL1'06'
    0A20 17           0A20 50        DC    IL1'23'
    0A21 1AA5         0A22 51        DC    AL2(INTRO)
    0A23 3C 40 1F78        52        MVI   PRT+1,X'40'            SET UP 'CLEARING' BYTE.
    0A27 0C 5A 1F77 1F78   53        MVC   PRT(91),PRT+1          CLEAR PRINT FIELD.
    0A2D C2 01 0A51        54        LA    RTN01,XR1              RESTORE RTN01 ADDRESS.
    0A31 34 01 0A07        55        ST    FRTN,XR1
                           56
    0A35 3D E0 0A4C        57        CLI   HPLXX,X'E0'            CURRENT HALT -E0- ?
    0A39 F2 81 07          58        JE    ALTER                  JUMP IF SO.
                           59
    0A3C 3C E0 0A4C        60        MVI   HPLXX,X'E0'            SET UP FOR HALT -E0-.
    0A40 F2 87 04          61        J     *+7
    0A43 3C E1 0A4C        62 ALTER  MVI   HPLXX,X'E1'            SET UP FOR HALT -E1-.
                           63
    0A47 C0 87 0222        64        B     HALT                   INLINE HALT -E0- OR -E1-.
    0A4B 40E1         0A4C 65 HPLXX  DC    XL2'40E1'
                           66
    0A4D C0 87 0A11        67        B     BEGINN                 REPEAT IF NO SYSTEM RESET.
```


4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           69 *********
                           70 * RTN01 *
                           71 ****************************************************************
                           72 *                                                              *
                           73 *      ROUTINE 01        TEST DATA BYTE TRANSFER. BYTE = 10.   *
                           74 *                                                              *
                           75 ****************************************************************
    0A51 01           0A51 76 RTN01  DC    XL1'01'                ROUTINE NUMBER.
    0A52 00           0A52 77        DC    XL1'00'                NO MANUAL INTERVENTION REQUIRED.
    0A53 0A62         0A54 78        DC    AL2(RTN02)             ROUTINE 02 ADDRESS.
                           79
    0A55 C0 87 180B        80        B     DATA                   GO DO DATA TRANSFER TEST.
    0A59 C4           0A59 81        DC    XL1'C4'                -CONTROL CODE.
    0A5A 0810         0A5B 82        DC    XL2'0810'              -EXPECTED DIAG-DTR.
    0A5C C1F1         0A5D 83        DC    XL2'C1F1'              -EXPECTED STATUS-LCR.
    0A5E 9371         0A5F 84        DC    XL2'9371'              -MAP REFERENCE FOR SENSE CHECK.
    0A60 40           0A60 85        DC    XL1'40'                -SENSE CHECK HALT.
    0A61 41           0A61 86        DC    XL1'41'                -BYTE CHECK HALT.
                           87
                           88
                           89 *********
                           90 * RTN02 *
                           91 ****************************************************************
                           92 *                                                              *
                           93 *      ROUTINE 02        TEST DATA BYTE TRANSFER. BYTE = 40.   *
                           94 *                                                              *
                           95 ****************************************************************
    0A62 02           0A62 96 RTN02  DC    XL1'02'                ROUTINE NUMBER
    0A63 00           0A63 97        DC    XL1'00'                NO MANUAL INTERVENTION REQUIRED
    0A64 0A73         0A65 98        DC    AL2(RTN03)             ROUTINE 03 ADDRESS
                           99
    0A66 C0 87 180B       100        B     DATA                   GO DO DATA TRANSFER TEST.
    0A6A D0           0A6A 101       DC    XL1'D0'                -CONTROL CODE.
    0A6B 0840         0A6C 102       DC    XL2'0840'              -EXPECTED DIAG-DTR.
    0A6D C1F1         0A6E 103       DC    XL2'C1F1'              -EXPECTED STATUS-LCR.
    0A6F 9441         0A70 104       DC    XL2'9441'              -MAP REFERENCE FOR SENSE CHECK.
    0A71 42           0A71 105       DC    XL1'42'                -SENSE CHECK HALT.
    0A72 43           0A72 106       DC    XL1'43'                -BYTE CHECK HALT.
                          107
                          108
                          109 *********
                          110 * RTN03 *
                          111 ****************************************************************
                          112 *                                                              *
                          113 *      ROUTINE 03        TEST DATA BYTE TRANSFER. BYTE =A0.    *
                          114 *                                                              *
                          115 ****************************************************************
    0A73 03           0A73 116 RTN03 DC    XL1'03'                ROUTINE NUMBER
    0A74 00           0A74 117       DC    XL1'00'                NO INTERVENTION REQUIRED
    0A75 0A84         0A76 118       DC    AL2(RTN04)             ROUTINE 04 ADDRESS
                          119
    0A77 C0 87 180B       120        B     DATA                   GO DO DATA TRANSFER TEST.
    0A7B E8           0A7B 121       DC    XL1'E8'                -CONTROL CODE.
    0A7C 08A0         0A7D 122       DC    XL2'08A0'              -EXPECTED DIAG-DTR.
    0A7E C1F1         0A7F 123       DC    XL2'C1F1'              -EXPECTED STATUS-LCR.
    0A80 9461         0A81 124       DC    XL2'9461'              -MAP REFERENCE FOR SENSE CHECK.
    0A82 44           0A82 125       DC    XL1'44'                -SENSE CHECK HALT.
    0A83 45           0A83 126       DC    XL1'45'                -BYTE CHECK HALT.
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          128 *********
                          129 * RTN04 *
                          130 ************************************************************************
                          131 *                                                                      *
                          132 *      ROUTINE 04        TEST DATA BYTE TRANSFER. BYTE = 05.           *
                          133 *                                                                      *
                          134 ************************************************************************
 0A84 04          0A84    135 RTN04  DC    XL1'04'          ROUTINE NUMBER
 0A85 00          0A85    136        DC    XL1'00'          NO MANUAL INTERVENTION REQUIRED
 0A86 0A95        0A87    137        DC    AL2(RTN05)       ROUTINE 05 ADDRESS
                          138
 0A88 C0 87 1808          139        B     DATA             GO DO DATA TRANSFER TEST.
 0A8C E1          0A8C    140        DC    XL1'E1'          -CONTROL CODE.
 0A8D 0805        0A8E    141        DC    XL2'0805'        -EXPECTED DIAG-DTR.
 0A8F C1F1        0A90    142        DC    XL2'C1F1'        -EXPECTED STATUS-LCR.
 0A91 9481        0A92    143        DC    XL2'9481'        -MAP REFERENCE FOR SENSE CHECK.
 0A93 46          0A93    144        DC    XL1'46'          -SENSE CHECK HALT.
 0A94 47          0A94    145        DC    XL1'47'          -BYTE CHECK HALT.
                          146
                          147
                          148 *********
                          149 * RTN05 *
                          150 ************************************************************************
                          151 *                                                                      *
                          152 *      ROUTINE 05        TEST DATA BYTE TRANSFER. BYTE = 0A.           *
                          153 *                                                                      *
                          154 ************************************************************************
 0A95 05          0A95    155 RTN05  DC    XL1'05'          ROUTINE NUMBER
 0A96 00          0A96    156        DC    XL1'00'          NO MANUAL INTERVENTION
 0A97 0AA6        0A98    157        DC    AL2(RTN06)       ROUTINE 06 ADDRESS
                          158
 0A99 C0 87 1808          159        B     DATA             GO DO DATA TRANSFER TEST.
 0A9D E2          0A9D    160        DC    XL1'E2'          -CONTROL CODE.
 0A9E 080A        0A9F    161        DC    XL2'080A'        -EXPECTED DIAG-DTR.
 0AA0 C1F1        0AA1    162        DC    XL2'C1F1'        -EXPECTED STATUS-LCR.
 0AA2 9501        0AA3    163        DC    XL2'9501'        -MAP REFERENCE FOR SENSE CHECK.
 0AA4 48          0AA4    164        DC    XL1'48'          -SENSE CHECK HALT.
 0AA5 49          0AA5    165        DC    XL1'49'          -BYTE CHECK HALT.
                          166
                          167
                          168 *********
                          169 * RTN06 *
                          170 ************************************************************************
                          171 *                                                                      *
                          172 *      ROUTINE 06        TEST BUSY AFTER DOING SIO CONTROL 1.          *
                          173 *                                                                      *
                          174 ************************************************************************
 0AA6 06          0AA6    175 RTN06  DC    XL1'06'          ROUTINE NUMBER
 0AA7 00          0AA7    176        DC    XL1'00'          NO MANUAL INTERVENTION REQUIRED
 0AA8 0AE2        0AA9    177        DC    AL2(RTN07)       ROUTINE 07 ADDRESS
                          178
 0AAA C0 87 021A          179        B     PRINT            PRINT BUSY TEST HEADING.
 0AAE 45          0AAE    180        DC    XL1'45'
 0AAF 15          0AAF    181        DC    IL1'21'
 0AB0 1CC6        0AB1    182        DC    AL2(HD06)
 0AB2 40A6        0AB3    183        DC    XL2'40A6'
                          184
 0AB4 C0 87 145C          185        B     INITL            INITIALIZE THE 3741.
                          186
 0AB8 C0 87 1511          187        B     QUES             TEST FOR SSW 10.
 0ABC F0 3C 3C            188        MPL   X'3C',X'3C'      HALT -FF- IF ON.
                          189
 0ABF 31 41 1A30          190        LIO   H0000,X'41'      CLEAR FUNCTION REGISTER.
 0AC3 31 42 1A30          191        LIO   H0000,X'42'      CLEAR LENGTH COUNT REGISTER.
 0AC7 31 44 1A62          192        LIO   ADRS,X'44'       LOAD ADDRESS INTO DATA ADRS REG.
 0ACB 31 45 1A30          193        LIO   H0000,X'45'      CLEAR DATA TRANSFER REGISTER.
                          194
 0ACF F3 43 00            195        SIO   X'00',X'43'      ISSUE START I/O CONTROL 1.
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0AD2 C1 42 0ADA          196        TIO   ISBSY,X'42'      BRANCH IF BUSY AS EXPECTED.
 0AD6 C0 87 14A8          197        B     NTBSY            GO TO ERROR MESSAGE IF NOT BUSY.
 0ADA C1 42 1491          198 ISBSY  TIO   BUSY,X'42'       BRANCH TO ERROR IF BUSY STILL ON.
                          199
 0ADE C0 87 0216          200        B     LINK             RETURN TO DCP.
                          201
                          202
                          203 *********
                          204 * RTN07 *
                          205 ************************************************************************
                          206 *                                                                      *
                          207 *      ROUTINE 07        TEST SINGLE CHARACTER TRANSFER WITH           *
                          208 *                        A WRITE CALL COMMAND.                         *
                          209 *                                                                      *
                          210 ************************************************************************
 0AE2 07          0AE2    211 RTN07  DC    XL1'07'          ROUTINE NUMBER
 0AE3 00          0AE3    212        DC    XL1'00'          NO MANUAL INTERVENTION REQUIRED
 0AE4 0B97        0AE5    213        DC    AL2(RTN08)       ROUTINE 08 ADDRESS
                          214
 0AE6 C0 87 021A          215        B     PRINT            PRINT WRITE TRANS TEST HEADING.
 0AEA 45          0AEA    216        DC    XL1'45'
 0AEB 25          0AEB    217        DC    IL1'37'
 0AEC 1CB1        0AED    218        DC    AL2(HD07)
 0AEE 40A7        0AEF    219        DC    XL2'40A7'
                          220
 0AF0 C0 87 145C          221        B     INITL            INITIALIZE THE 3741.
                          222
 0AF4 C0 87 1511          223        B     QUES             TEST FOR SSW 10.
 0AF8 F0 3C 3C            224        MPL   X'3C',X'3C'      HALT -FF- IF ON.
                          225
 0AFB 31 41 1A34          226        LIO   H0002,X'41'      SET FNCT REG TO 6 USEC RESET.
 0AFF 31 42 1A50          227        LIO   H00FF,X'42'      LOAD LENGTH COUNT REG. TO FF.
 0B03 31 44 1A62          228        LIO   ADRS,X'44'       LOAD ADDRESS IN DATA ADRS REG.
 0B07 3C AA 1998          229        MVI   DADATA,X'AA'     INITIALIZES DADATA TO A X'AA'.
 0B0B 31 41 1A58          230        LIO   H8082,X'41'      SET 3741 TO DIAGNOSTIC MODE.
                          231
 0B0F F3 42 00            232        SIO   X'00',X'42'      ISSUE A WRITE CALL.
 0B12 F3 44 40            233        SIO   X'40',X'44'      ISSUE CONTROL 2. I/O SELECT 13
 0B15 F3 44 40            234        SIO   X'40',X'44'      - FORCES SERVICE REQUEST.
 0B18 30 45 0B5C          235        SNS   SS07A,X'45'      SENSE DIAGNOSTIC/DATA TRANS -2500-.
 0B1C 3C 00 0B5C          236        MVI   SS07A,X'00'      CLEAR DATA TRANS REG.
                          237
 0B20 0D 01 0B5C 0B5A     238        CLC   SS07A(2),SS07A-2 DIAGNOSTIC/DATA TRANS AS EXPECTED ?
 0B26 F2 01 21            239        JNE   ER07A            JUMP IF NOT.
                          240
 0B29 F3 44 80            241        SIO   X'80',X'44'      DO CONTROL 2 TO CAUSE EOT.
 0B2C 30 42 0B80          242        SNS   SS07B,X'42'      SENSE STATUS/LENGTH COUNT FOR -E100-
 0B30 30 45 0B85          243        SNS   SS07C,X'45'      SENSE DIAGNOSTIC/DATA TRANS -00AA-.
                          244
 0B34 0D 01 0B85 0B83     245        CLC   SS07C(2),SS07C-2 DIAGNOSTIC/DATA TRANS AS EXPECTED ?
 0B3A F2 01 31            246        JNE   ERR07           JUMP IF NOT.
 0B3D 0D 01 0B80 0B7E     247        CLC   SS07B(2),SS07B-2 STATUS/LENGTH COUNT AS EXPECTED ?
 0B43 F2 01 28            248        JNE   ERR07           JUMP IF NOT.
                          249
 0B46 C0 87 0216          250        B     LINK             RETURN TO DCP.
                          251
                          252 * ROUTINE 07 ERROR MESSAGES *
                          253
 0B4A C0 87 021A          254 ER07A  B     PRINT            PRINT RESPONSE CHECK.
 0B4E C2          0B4E    255        DC    XL1'C2'
 0B4F 17          0B4F    256        DC    IL1'23'
 0B50 1E07        0B51    257        DC    AL2(SRVCK)
 0B52 404A        0B53    258        DC    XL2'404A'
                          259
 0B54 C0 87 1699          260        B     ERROR            DUMP DIAGNOSTIC/DATA TRANS REG.
 0B58 05          0B58    261        DC    XL1'05'
 0B59 2500        0B5A    262        DC    XL2'2500'        -EXPECTED.
 0B5B 0000        0B5C    263 SS07A  DC    XL2'0000'        -ACTUAL.
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    0B5D FF              0B5D  264         DC    XL1'FF'
    0B5E C0 87 14EA            265         B     MAPS              POINT TO MAP CHART.
    0B62 9541              0B63 266         DC    XL2'9541'         -PAGE 954, ENTRY 1.
    0B64 C0 87 0222            267         B     HALT              ERROR HALT -4A-.
    0B68 404A              0B69 268         DC    XL2'404A'
    0B6A C0 87 0216            269         B     LINK              RETURN TO DCP.
                               270
    0B6E C0 87 021A            271 ERR07   B     PRINT             PRINT WRITE CHECK.
    0B72 C2                0B72 272         DC    XL1'C2'
    0B73 1B                0B73 273         DC    IL1'27'
    0B74 1DDF              0B75 274         DC    AL2(WRTCK)
    0B76 404C              0B77 275         DC    XL2'404C'
                               276
    0B78 C0 87 1699            277         B     ERROR             DUMP THESE REGISTERS-
    0B7C 02                0B7C 278         DC    XL1'02'           STATUS/LENGTH COUNT REG.
    0B7D E300              0B7E 279         DC    XL2'E300'         -EXPECTED.
    0B7F 0000              0B80 280 SS07B   DC    XL2'0000'         -ACTUAL.
    0B81 05                0B81 281         DC    XL1'05'           DIAGNOSTIC/DATA TRANS REG.
    0B82 00AA              0B83 282         DC    XL2'00AA'         -EXPECTED.
    0B84 0000              0B85 283 SS07C   DC    XL2'0000'         -ACTUAL.
    0B86 FF                0B86 284         DC    XL1'FF'
    0B87 C0 87 14EA            285         B     MAPS              POINT TO MAP CHART.
    0B8B 9542              0B8C 286         DC    XL2'9542'         -PAGE 954, ENTRY 2.
    0B8D C0 87 0222            287         B     HALT              ERROR HALT -4C-.
    0B91 404C              0B92 288         DC    XL2'404C'
    0B93 C0 87 0216            289         B     LINK              RETURN TO DCP.
                               290
                               291
                               292 *********
                               293 * RTN08 *
                               294 ***************************************************************
                               295 *                                                             *
                               296 *       ROUTINE 08          CHECK FOR SERVICE RESPONSE RESET  *
                               297 *                           AFTER 6 USEC.                     *
                               298 *                                                             *
                               299 ***************************************************************
    0B97 08                0B97 300 RTN08   DC    XL1'08'           ROUTINE NUMBER
    0B98 00                0B98 301         DC    XL1'00'           NO MANUAL INTERVENTION REQUIRED
    0B99 0C4F              0B9A 302         DC    AL2(RTN09)        ROUTINE 09 ADDRESS
                               303
    0B9B C0 87 021A            304         B     PRINT             PRINT SERVICE RESPONSE HEADING.
    0B9F 45                0B9F 305         DC    XL1'45'
    0BA0 29                0BA0 306         DC    IL1'41'
    0BA1 1C8C              0BA2 307         DC    AL2(HD08)
    0BA3 40A9              0BA4 308         DC    XL2'40A9'
                               309
    0BA5 C0 87 145C            310         B     INITL             RESET THE 3741.
                               311
    0BA9 C0 87 1511            312         B     QUES              TEST FOR SSW 10.
    0BAD F0 3C 3C              313         HPL   X'3C',X'3C'       HALT -FF- IF ON.
                               314
    0BB0 31 41 1A48            315         LIO   HD082,X'41'       PUT 3741 IN DIAGNOSTIC MODE.
    0BB4 31 42 1A30            316         LIO   HD000,X'42'       CLEAR LENGTH COUNT REGISTER.
    0BB8 31 44 1A66            317         LIO   ADRS00,X'44'      LOAD -00- BYTE ADRS IN DAR.
    0BBC 31 45 1A30            318         LIO   HD000,X'45'       CLEAR DATA TRANS REGISTER.
    0BC0 31 41 1A44            319         LIO   H4190,X'41'       SET 3741 IN RESET SER RESP AFTER
                               320 *                                 6 USEC, SLAVE, DIAG. MODE, AND
                               321 *                                 LATCH XFER LINE 3 (TRL 3).
                               322 *
                               323
    0BC4 F3 42 00              324         SIO   X'00',X'42'       ISSUE A WRITE CALL.
    0BC7 F3 44 40              325         SIO   X'40',X'44'       ISSUE CONTROL 2. I/O SELECT 13.
    0BCA F3 44 40              326         SIO   X'40',X'44'       - FORCES SERVICE REQUEST.
    0BCD 30 43 0C19            327         SNS   SS14A,X'43'       DUMMY SENSE TO STALL
    0BD1 30 43 0C19            328         SNS   SS14A,X'43'       SENSE TRL FOR -FF06-
                               329 *                                 (THE 06 MEANS SER RESP SET TRL 3
                               330 *                                  LATCH, I/O TRANSFER 2 RESULTS
                               331 *                                  IO DISCONNECT)
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    0BD5 30 45 0C3D            332         SNS   SS14B,X'45'       SENSE DIAGNOSTIC/DATA TRANS -0500-.
                               333
    0BD9 0D 01 0C19 0C17       334         CLC   SS14A(2),SS14A-2  DID SERV RESP SET TRL 3 LATCH ?
    0BDF F2 01 0D              335         JNE   ER14A             JUMP IF NOT.
    0BE2 0D 01 0C3D 0C3B       336         CLC   SS14B(2),SS14B-2  DID SERVICE RESPONSE RESET ?
    0BE8 F2 01 40              337         JNE   ER14              JUMP IF NOT.
                               338
    0BEB C0 87 0216            339         B     LINK              RETURN TO DCP.
                               340
                               341 * ROUTINE 08 ERROR MESSAGES *
                               342
    0BEF 0C 20 1F3D 1E2B       343 ER14A   MVC   PRT-5B(33),SRVR
    0BF5 0C 05 1994 1F3F       344         MVC   TEST(6),PRT-56
    0BFB 0C 05 1F3D 1994       345         MVC   PRT-5B(6),TEST
    0C01 C0 87 021A            346         B     PRINT             PRINT RESPONSE NOT SET.
    0C05 C2                0C05 347         DC    XL1'C2'
    0C06 5B                0C06 348         DC    IL1'91'
    0C07 1F77              0C08 349         DC    AL2(PRT)
    0C09 404E              0C0A 350         DC    XL2'404E'
    0C0B 0C 5A 1F77 1F78       351         MVC   PRT(91),PRT+1     CLEAR PRINT AREA.
                               352
    0C11 C0 87 1699            353         B     ERROR             DUMP DIAGNOSTIC/DATA TRANSFER REG.
    0C15 03                0C15 354         DC    XL1'03'
    0C16 FF06              0C17 355         DC    XL2'FF06'         -EXPECTED.
    0C18 0000              0C19 356 SS14A   DC    XL2'0000'         -ACTUAL.
    0C1A FF                0C1A 357         DC    XL1'FF'
    0C1B C0 87 14EA            358         B     MAPS              POINT TO MAP CHART.
    0C1F 9561              0C20 359         DC    XL2'9561'         -PAGE 956, ENTRY 1.
    0C21 C0 87 0222            360         B     HALT              ERROR HALT -4E-.
    0C25 404E              0C26 361         DC    XL2'404E'
    0C27 C0 87 0216            362         B     LINK              RETURN TO DCP.
                               363
    0C2B C0 87 021A            364 ER14    B     PRINT             PRINT RESPONSE NOT RESET.
    0C2F C2                0C2F 365         DC    XL1'C2'
    0C30 21                0C30 366         DC    IL1'33'
    0C31 1E2B              0C32 367         DC    AL2(SRVR)
    0C33 404F              0C34 368         DC    XL2'404F'
                               369
    0C35 C0 87 1699            370         B     ERROR             DUMP DIAGNOSTIC/DATA TRANS REG.
    0C39 05                0C39 371         DC    XL1'05'
    0C3A 0DC0              0C3B 372         DC    XL2'0DC0'         -EXPECTED.
    0C3C 0000              0C3D 373 SS14B   DC    XL2'0000'         -ACTUAL.
    0C3E FF                0C3E 374         DC    XL1'FF'
    0C3F C0 87 14EA            375         B     MAPS              POINT TO MAP CHART.
    0C43 9562              0C44 376         DC    XL2'9562'         -PAGE 956, ENTRY 2.
    0C45 C0 87 0222            377         B     HALT              ERROR HALT -4F-.
    0C49 404F              0C4A 378         DC    XL2'404F'
    0C4B C0 87 0216            379         B     LINK              RETURN TO DCP.
                               380
                               381
                               382 *********
                               383 * RTN09 *
                               384 ***************************************************************
                               385 *                                                             *
                               386 *       ROUTINE 09          TEST SERVICE RESPONSE DRIVER.     *
                               387 *                                                             *
                               388 ***************************************************************
    0C4F 09                0C4F 389 RTN09   DC    XL1'09'           ROUTINE NUMBER
    0C50 00                0C50 390         DC    XL1'00'           NO MANUAL INTERVENTION REQUIRED
    0C51 0CBB              0C52 391         DC    AL2(RTN0A)        ROUTINE 0A ADDRESS
                               392
    0C53 C0 87 021A            393         B     PRINT             PRINT RESPONSE DRIVER HEADING.
    0C57 45                0C57 394         DC    XL1'45'
    0C58 1D                0C58 395         DC    IL1'29'
    0C59 1C63              0C5A 396         DC    AL2(HD09)
    0C5B 40A9              0C5C 397         DC    XL2'40A9'
                               398
    0C5D C0 87 145C            399         B     INITL             INITIALIZE THE 3741.
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           400
 0C61 C0 87 1511           401         B     QUES              TEST FOR SSW 10.
 0C65 F0 3C 3C             402         HPL   X'3C',X'3C'      HALT -FF- IF ON.
                           403
 0C68 31 41 1A34           404         LIO   H0002,X'41'       SET FNCT REG TO 6 USEC RESET.
 0C6C 31 42 1A52           405         LIO   H00F0,X'42'       LOAD -F0- IN THE LENGTH COUNT REG.
 0C70 31 44 1A66           406         LIO   ADRS00,X'44'      LOAD BYTE -00- ADDRESS IN DAR.
 0C74 31 45 1A30           407         LIO   H0000,X'45'       CLEAR DATA TRANSFER REGISTER.
 0C78 31 41 1A40           408         LIO   H0080,X'41'       SET 3741 TO DIAGNOSTIC MODE OF OP.
                           409
 0C7C F3 42 00             410         SIO   X'00',X'42'       ISSUE A WRITE CALL.
 0C7F F3 44 40             411         SIO   X'40',X'44'       DO CONTROL 2. I/O SELECT 13.
 0C82 F3 44 40             412         SIO   X'40',X'44'       - FORCES SERVICE REQUEST.
 0C85 30 43 0CA9           413         SNS   SS15A,X'43'       DO A DUMMY SENSE TO STALL.
 0C89 30 43 0CA9           414         SNS   SS15A,X'43'       SENSE TRANS LINES FOR -FF04-.
                           415
 0C8D 0D 01 0CA9 0CA7      416         CLC   SS15A(2),SS15A-2  TRANS LINES AS EXPECTED ?
 0C93 C0 81 0216           417         BE    LINK              RETURN TO DCP IF SO.
                           418
                           419 * ROUTINE 09 ERROR MESSAGE *
                           420
 0C97 C0 87 021A           421         B     PRINT             PRINT DRIVER CHECK.
 0C9B C2             0C9B  422         DC    XL1'C2'
 0C9C 1E             0C9C  423         DC    IL1'30'
 0C9D 1E46           0C9E  424         DC    AL2(DRIVCK)
 0C9F 4050           0CA0  425         DC    XL2'4050'
                           426
 0CA1 C0 87 1699           427         B     ERROR             DUMP I/O TRANSFER LINES.
 0CA5 03             0CA5  428         DC    XL1'03'
 0CA6 FF04           0CA7  429         DC    XL2'FF04'         -EXPECTED.
 0CA8 0000           0CA9  430 SS15A   DC    XL2'0000'         -ACTUAL.
 0CAA FF             0CAA  431         DC    XL1'FF'
 0CAB C0 87 14EA           432         B     MAPS              POINT TO MAP CHART.
 0CAF 9563           0CB0  433         DC    XL2'9563'         -PAGE 956, ENTRY 3.
 0CB1 C0 87 0222           434         B     HALT              ERROR HALT -50-.
 0CB5 405C           0CB6  435         DC    XL2'4050'
 0CB7 C0 87 0216           436         B     LINK              RETURN TO DCP.
                           437
                           438
                           439 *********
                           440 * RTN0A *
                           441 ************************************************************
                           442 *                                                          *
                           443 *       ROUTINE 0A          TRANSFER 3 DATA BYTES TO CHECK THE *
                           444 *                           COUNTERS AND ADDRESSES FOR INCREMENTING. *
                           445 *                                                          *
                           446 ************************************************************
 0CB8 0A             0CB8  447 RTN0A   DC    XL1'0A'           ROUTINE NUMBER
 0CB9 00             0CB9  448         DC    XL1'00'           NO MANUAL INTERVENTION REQUIRED
 0CBA 0E0C           0CBA  449         DC    AL2(RTN0B)        ROUTINE 0C ADDRESS
                           450
 0CBC C0 87 021A           451         B     PRINT             PRINT TRANSFER 3 BYTES HEADING.
 0CC0 45             0CC0  452         DC    XL1'45'
 0CC1 19             0CC1  453         DC    IL1'25'
 0CC2 1C46           0CC2  454         DC    AL2(HD0A)
 0CC4 40AA           0CC4  455         DC    XL2'40AA'
                           456
 0CC6 C0 87 145C           457         B     INITL             INITIALIZE THE 3741.
                           458
 0CCA C0 87 1511           459         B     QUES              TEST FOR SSW 10.
 0CCE F0 3C 3C             460         HPL   X'3C',X'3C'       HALT -FF- IF ON.
                           461
 0CD1 31 41 1A34           462         LIO   H0002,X'41'       SET FNCT REG FOR 6 USEC RESET.
 0CD5 31 44 1A62           463         LIO   ADRS,X'44'        LOAD DATA BYTE ADDRESS IN DAR.
 0CD9 31 45 1A30           464         LIO   H0000,X'45'       CLEAR DATA TRANSFER REGISTER.
 0CDD 31 42 1A5C           465         LIO   H00FB,X'42'       LOAD -FB- IN LENGTH COUNT REG.
 0CE1 31 41 1A40           466         LIO   H0080,X'41'       PUT 3741 IN DIAGNOSTIC MODE.
                           467
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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0CE8 F3 41 00             468         SIO   X'00',X'41'       ISSUE A READ CALL.
 0CEB F3 44 61             469         SIO   X'61',X'44'       DO 2 CONTROL 2'S TO TRANSFER DATA
 0CEE F3 44 61             470         SIO   X'61',X'44'        BYTE -05-.
                           471
 0CF1 30 45 0D86           472         SNS   SS16A,X'45'       SENSE DIAGNOSTIC/DATA TRANS -2305-.
 0CF5 30 42 0D8B           473         SNS   SS16B,X'42'       SENSE STATUS/LENGTH COUNT FOR -81FC-
 0CF9 30 44 0D90           474         SNS   SS16C,X'44'       SENSE DATA ADDRESS REGISTER.
                           475
 0CFD 0D 01 0D86 0D84      476         CLC   SS16A(2),SS16A-2  DIAGNOSTIC/DATA TRANS AS EXPECTED ?
 0D03 F2 01 70             477         JNE   ER16              JUMP IF NOT.
 0D06 0D 01 0D8B 0D89      478         CLC   SS16B(2),SS16B-2  STATUS/LENGTH COUNT AS EXPECTED ?
 0D0C F2 01 67             479         JNE   ER16              JUMP IF NOT.
 0D0F 0D 01 0D90 0D8E      480         CLC   SS16C(2),SS16C-2  DATA ADDRESS REGISTER INCREMENT ?
 0D15 F2 01 5E             481         JNE   ER16              JUMP IF NOT.
                           482
 0D18 F3 44 62             483         SIO   X'62',X'44'       DO 2 CONTROL 2'S TO TRANSFER DATA
 0D1B F3 44 62             484         SIO   X'62',X'44'        BYTE -0A-.
                           485
 0D1E 30 45 0D82           486         SNS   SS16E,X'45'       SENSE DIAGNOSTIC/DATA TRANS -230A-.
 0D22 30 42 0D87           487         SNS   SS16F,X'42'       SENSE STATUS/LENGTH COUNT -81FD-.
 0D26 30 44 0D8C           488         SNS   SS16M,X'44'       SENSE DATA ADDRESS REGISTER.
                           489
 0D2A 0D 01 0D82 0D80      490         CLC   SS16E(2),SS16E-2  DIAGNOSTIC/DATA TRANS AS EXPECTED ?
 0D30 F2 01 6F             491         JNE   ERR16             JUMP IF NOT.
 0D33 0D 01 0D87 0D85      492         CLC   SS16F(2),SS16F-2  STATUS/LENGTH COUNT AS EXPECTED ?
 0D39 F2 01 66             493         JNE   ERR16             JUMP IF NOT.
 0D3C 0D 01 0D8C 0D8A      494         CLC   SS16M(2),SS16M-2  DATA ADDRESS REG INCREMENT ?
 0D42 F2 01 5D             495         JNE   ERR16             JUMP IF NOT.
                           496
 0D45 F3 44 68             497         SIO   X'68',X'44'       DO 2 CONTROL 2'S TO TRANSFER DATA
 0D48 F3 44 68             498         SIO   X'68',X'44'        BYTE -A0-.
                           499
 0D4B 30 45 0DDE           500         SNS   SS16I,X'45'       SENSE DIAGNOSTIC/DATA TRANS -23A0-.
 0D4F 30 42 0DE3           501         SNS   SS16J,X'42'       SENSE STATUS/LENGTH COUNT -81FE-.
 0D53 30 44 0DE8           502         SNS   SS16K,X'44'       SENSE DATA ADDRESS REGISTER.
                           503
 0D57 0D 01 0DDE 0DDC      504         CLC   SS16I(2),SS16I-2  DIAGNOSTIC/DATA TRANS AS EXPECTED ?
 0D5D F2 01 6E             505         JNE   ERR16             JUMP IF NOT.
 0D60 0D 01 0DE3 0DE1      506         CLC   SS16J(2),SS16J-2  STATUS/LENGTH COUNT AS EXPECTED ?
 0D66 F2 01 65             507         JNE   ERR16             JUMP IF NOT.
 0D69 0D 01 0DE8 0DE6      508         CLC   SS16K(2),SS16K-2  DATA ADDRESS REGISTER INCREMENTING ?
 0D6F F2 01 5C             509         JNE   ERR16             JUMP IF NOT.
                           510
 0D72 C0 87 0216           511         B     LINK              RETURN TO DCP.
                           512
                           513 * ROUTINE 0A ERROR MESSAGES *
                           514
 0D76 3C 51 0E07           515 ER16    MVI   RTRN-1,X'51'
 0D7A C0 87 0DFA           516         B     E16               PRINT CHECK, ID -51-.
                           517
 0D7E C0 87 1699           518         B     ERROR             DUMP THESE REGISTERS-
 0D82 05             0D82  519         DC    XL1'05'           DIAGNOSTIC/DATA TRANSFER REG.
 0D83 2305           0D84  520         DC    XL2'2305'         -EXPECTED.
 0D85 0000           0D86  521 SS16A   DC    XL2'0000'         -ACTUAL.
 0D87 02             0D87  522         DC    XL1'02'           STATUS/LENGTH COUNT REG.
 0D88 81FC           0D89  523         DC    XL2'81FC'         -EXPECTED.
 0D8A 0000           0D8B  524 SS16B   DC    XL2'0000'         -ACTUAL.
 0D8C 04             0D8C  525         DC    XL1'04'           DATA ADDRESS REGISTER.
 0D8D 1999           0D8E  526         DC    AL2(DADATA+1)     -EXPECTED.
 0D8F 0000           0D90  527 SS16C   DC    XL2'0000'         -ACTUAL.
 0D91 FF             0D91  528         DC    XL1'FF'
 0D92 C0 87 14EA           529         B     MAPS              POINT TO MAP CHART.
 0D96 9581           0D97  530         DC    XL2'9581'         -PAGE 958, ENTRY 1.
 0D98 C0 87 0222           531         B     HALT              ERROR HALT -51-.
 0D9C 4051           0D9D  532         DC    XL2'4051'
 0D9E C0 87 0216           533         B     LINK
                           534
 0DA2 3C 52 0E07           535 ER16    MVI   RTRN-1,X'52'
```

4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    0DA6 C0 87 0DFA            536        B     E16          PRINT CHECK. ID -52-.
                               537
    0DAA C0 87 1699            538        B     ERROR
    0DAE 05              0DAE  539        DC    XL1'05'      DUMP THESE REGISTERS-
    0DAF 230A            0DB0  540        DC    XL2'230A'    DIAGNOSTIC/DATA TRANSFER REG.
    0DB1 0000            0DB2  541 SS16E  DC    XL2'0000'    -EXPECTED.
    0DB3 02              0DB3  542        DC    XL1'02'      -ACTUAL.
    0DB4 81FD            0DB5  543        DC    XL2'81FD'    STATUS/LENGTH COUNT REG.
    0DB6 0000            0DB7  544 SS16F  DC    XL2'0000'    -EXPECTED.
    0DB8 04              0DB8  545        DC    XL1'04'      -ACTUAL.
    0DB9 199A            0DBA  546        DC    AL2(DADATA+2) DATA ADDRESS REGISTER.
    0DBB 0000            0DBC  547 SS16H  DC    XL2'0000'    -EXPECTED.
    0DBD FF              0DBD  548        DC    XL1'FF'      -ACTUAL.
    0DBE C0 87 14EA            549        B     MAPS

    0DC2 9581            0DC3  550        DC    XL2'9581'    POINT TO MAP CHART.
    0DC4 C0 87 0222            551        B     HALT         -PAGE 958, ENTRY 1.
    0DC8 4052            0DC9  552        DC    XL2'4052'    ERROR HALT -52-.
    0DCA C0 87 0216            553        B     LINK

                               554                           RETURN TO DCP.
    0DCE 3C 53 0E07            555 ERRR16 MVI   RTRN-1,X'53'
    0DD2 C0 87 0DFA            556        B     E16          PRINT CHECK. ID -53-.
                               557
    0DD6 C0 87 1699            558        B     ERROR
    0DDA 05              0DDA  559        DC    XL1'05'      DUMP THESE REGISTERS-
    0DDB 23A0            0DDC  560        DC    XL2'23A0'    DIAGNOSTIC/DATA TRANS REG.
    0DDD 0000            0DDE  561 SS16I  DC    XL2'0000'    -EXPECTED.
    0DDF 02              0DDF  562        DC    XL1'02'      -ACTUAL.
    0DE0 81FE            0DE1  563        DC    XL2'81FE'    STATUS/LENGTH COUNT REG.
    0DE2 0000            0DE3  564 SS16J  DC    XL2'0000'    -EXPECTED.
    0DE4 04              0DE4  565        DC    XL1'04'      -ACTUAL.
    0DE5 199B            0DE6  566        DC    AL2(DADATA+3) DATA ADDRESS REGISTER.
    0DE7 0000            0DE8  567 SS16K  DC    XL2'0000'    -EXPECTED.
    0DE9 FF              0DE9  568        DC    XL1'FF'      -ACTUAL.
    0DEA C0 87 14EA            569        B     MAPS

    0DEE 9581            0DEF  570        DC    XL2'9581'    POINT TO MAP CHART.
    0DF0 C0 87 0222            571        B     HALT         -PAGE 958, ENTRY 1.
    0DF4 4053            0DF5  572        DC    XL2'4053'    ERROR HALT -53-.
    0DF6 C0 87 0216            573        B     LINK

                               574                           RETURN TO DCP.
    0DFA 34 08 0E0B            575 E16    ST    RTRN+3,ARR
    0DFE C0 87 021A            576        B     PRINT        PRINT TRANSFER CHECK.
    0E02 C2              0E02  577        DC    XL1'C2'
    0E03 14              0E03  578        DC    IL1'20'
    0E04 1BA6            0E05  579        DC    AL2(SNCK)
    0E06 4000            0E07  580        DC    XL2'4000'
    0E08 C0 87 0000            581 RTRN   B     *-*
                               582
                               583
                               584 *********
                               585 * RTN0B *
                               586 ***************************************************************************
                               587 *                                                                         *
                               588 *       ROUTINE 0B          TEST LENGTH COUNT REGISTER                    *
                               589 *                           OVERFLOW BY READ CALL.                        *
                               590 *                                                                         *
                               591 ***************************************************************************
    0E0C 0B              0E0C  592 RTN0B  DC    XL1'0B'      ROUTINE NUMBER
    0E0D 00              0E0D  593        DC    XL1'00'      NO MANUAL INTERVENTION REQUIRED
    0E0E 0EC8            0E0F  594        DC    AL2(RTN0C)   ROUTINE 0C ADDRESS
                               595
    0E10 C0 87 021A            596        B     PRINT        PRINT EOT HEADING.
    0E14 45              0E14  597        DC    XL1'45'
    0E15 2F              0E15  598        DC    IL1'47'
    0E16 18EC            0E17  599        DC    AL2(HD0B)
    0E18 40AB            0E19  600        DC    XL2'40AB'
                               601
    0E1A C0 87 145C            602        B     INITL        INITIALIZE THE 3741.
                               603
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    0E1E C0 87 1511            604        B     QUES
    0E22 F0 3C 3C              605        HPL   X'3C',X'3C'
                               606
    0E25 31 41 1A34            607        LIO   H0002,X'41'
    0E29 31 44 1A62            608        LIO   ADRS,X'44'
    0E2D 31 45 1A30            609        LIO   H0000,X'45'
    0E31 31 42 1A5E            610        LIO   H00FE,X'42'
    0E35 31 41 1A40            611        LIO   H0080,X'41'
                               612
    0E39 F3 41 00              613        SIO   X'00',X'41'
    0E3C F3 44 74              614        SIO   X'74',X'44'
    0E3F F3 44 74              615        SIO   X'74',X'44'
                               616
    0E42 30 42 0E8D            617        SNS   SS17B,X'42'
                               618
    0E46 0D 01 0E8D 0E8B       619        CLC   SS17B(2),SS17B-2
    0E4C F2 01 2C              620        JNE   ER17
                               621
    0E4F 31 45 1A30            622        LIO   H0000,X'45'
    0E53 F3 44 61              623        SIO   X'61',X'44'
    0E56 F3 44 61              624        SIO   X'61',X'44'
    0E59 30 45 0EB1            625        SNS   SS17C,X'45'
                               626
    0E5D 30 45 0EB1            627        SNS   SS17C,X'45'
    0E61 30 42 0EB6            628        SNS   SS17D,X'42'
                               629
    0E65 0D 01 0EB1 0EAF       630        CLC   SS17C(2),SS17C-2
    0E6B F2 01 31              631        JNE   ER17
    0E6E 0D 01 0EB6 0EB4       632        CLC   SS17D(2),SS17D-2
    0E74 F2 01 28              633        JNE   ER17
                               634
    0E77 C0 87 0216            635        B     LINK

                               636
                               637 * ROUTINE 0B ERROR MESSAGES *
                               638
    0E7B C0 87 021A            639 ER17   B     PRINT        PRINT SENSE CHECK.
    0E7F C2              0E7F  640        DC    XL1'C2'
    0E80 0C              0E80  641        DC    IL1'12'
    0E81 1EAD            0E82  642        DC    AL2(SNSCK)
    0E83 4055            0E84  643        DC    XL2'4055'
                               644
    0E85 C0 87 1699            645        B     ERROR        DUMP STATUS/LENGTH COUNT REG.
    0E89 02              0E89  646        DC    XL1'02'
    0E8A 81FF            0E8B  647        DC    XL2'81FF'    -EXPECTED.
    0E8C 0000            0E8D  648 SS17B  DC    XL2'0000'    -ACTUAL.
    0E8E FF              0E8E  649        DC    XL1'FF'
    0E8F C0 87 14EA            650        B     MAPS

    0E93 9582            0E94  651        DC    XL2'9582'    POINT TO MAP CHART.
    0E95 C0 87 0222            652        B     HALT         -PAGE 958, ENTRY 2.
    0E99 4055            0E9A  653        DC    XL2'4055'    ERROR HALT -55-.
    0E9B C0 87 0216            654        B     LINK

                               655                           RETURN TO DCP.
    0E9F C0 87 021A            656 ERR17  B     PRINT        PRINT EOT CHECK.
    0EA3 C2              0EA3  657        DC    XL1'C2'
    0EA4 0A              0EA4  658        DC    IL1'10'
    0EA5 1E68            0EA6  659        DC    AL2(CKEOT)
    0EA7 4056            0EA8  660        DC    XL2'4056'
                               661
    0EA9 C0 87 1699            662        B     ERROR        DUMP THESE REGISTERS-
    0EAD 05              0EAD  663        DC    XL1'05'      DIANGOSTIC/DATA TRANS REG.
    0EAE 0805            0EAF  664        DC    XL2'0805'    -EXPECTED.
    0EB0 0000            0EB1  665 SS17C  DC    XL2'0000'    -ACTUAL.
    0EB2 02              0EB2  666        DC    XL1'02'      STATUS/LENGTH COUNT REG.
    0EB3 E300            0EB4  667        DC    XL2'E300'    -EXPECTED.
    0EB5 0000            0EB6  668 SS17D  DC    XL2'0000'    -ACTUAL.
    0EB7 FF              0EB7  669        DC    XL1'FF'
    0EB8 C0 87 14EA            670        B     MAPS

    0EBC 9583            0EBD  671        DC    XL2'9583'    POINT TO MAP CHART.
                                                             -PAGE 958, ENTRY 1.
```

4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   0EBE C0 87 0222            672        B     HALT                ERROR HALT -56-.
   0EC2 4056            0EC3  673        DC    XL2'4056'
   0EC4 C0 87 0216            674        B     LINK                RETURN TO DCP.
```


4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                                676 *********
                                677 * RTN0C *
                                678 ************************************************************************
                                679 *                                                                      *
                                680 *      ROUTINE 0C        TEST LCR OVERFLOW BY WRITE CALL.              *
                                681 *                                                                      *
                                682 ************************************************************************
   0EC8 0C                0EC8  683 RTN0C  DC    XL1'0C'             ROUTINE NUMBER
   0EC9 00                0EC9  684        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
   0ECA 0F93              0ECB  685        DC    AL2(RTN0D)          ROUTINE 0D ADDRESS
                                686
   0ECC C0 87 021A              687        B     PRINT               PRINT EOT HEADING.
   0ED0 45                0ED0  688        DC    XL1'45'
   0ED1 30                0ED1  689        DC    IL1'48'
   0ED2 1CF6              0ED3  690        DC    AL2(MD0C)
   0ED4 40AC              0ED5  691        DC    XL2'40AC'
                                692
   0ED6 C0 87 145C              693        B     INITL               INITIALIZE THE 3741.
                                694
   0EDA C0 87 1511              695        B     QUES                TEST FOR SSW 10.
   0EDE F0 3C 3C                696        HPL   X'3C',X'3C'         HALT -FF- IF ON.
                                697
   0EE1 31 41 1A48              698        LIO   M0082,X'41'         DO 6 USEC RESET AND PUT IN DIAG MODE
   0EE5 31 45 1A30              699        LIO   M0000,X'45'         CLEAR DATA TRANSFER REGISTER.
   0EE9 31 42 1A50              700        LIO   M00FF,X'42'         LOAD -FF- IN LENGTH COUNT REGISTER.
   0EED 31 44 1A62              701        LIO   ADRS,X'44'          LOAD ADDRESS IN DATA ADRS REG.
   0EF1 31 41 1A40              702        LIO   M0080,X'41'         SET FNCT REGISTER TO DIAG MODE.
                                703
   0EF5 F3 42 00                704        SIO   X'00',X'42'         ISSUE WRITE CALL START I/O.
   0EF8 F3 44 40                705        SIO   X'40',X'44'         DO CONTROL 2 SIO TWICE TO FORCE
   0EFB F3 44 40                706        SIO   X'40',X'44'         - I/O CYCLE.
   0EFE 30 42 0F54              707        SNS   SS18B,X'42'         SENSE STATUS/LENGTH COUNT -8300-.
   0F02 30 45 0F4F              708        SNS   SS18A,X'45'         SENSE DIAGNOSTIC/DATA TRANS -2500-.
                                709
   0F06 0D 00 0F4E 0F4C         710        CLC   SS18A-1(1),SS18A+3  DIAGNOSTIC BYTE AS EXPECTED ?
   0F0C F2 01 2A                711        JNE   ER18                JUMP IF NOT.
   0F0F 0D 01 0F54 0F52         712        CLC   SS18B(2),SS18B-2    STATUS/LENGTH COUNT AS EXPECTED ?
   0F15 F2 01 21                713        JNE   ER18                JUMP IF NOT.
                                714
   0F18 F3 44 40                715        SIO   X'40',X'44'         THIS CONTROL 2 CAUSES -OVERFLOW-.
   0F1B 30 45 0F7C              716        SNS   SS18D,X'45'         SENSE DIAGNOSTIC/DATA TRANS -0800-.
   0F1F 30 42 0F81              717        SNS   SS18E,X'42'         SENSE STATUS/LENGTH COUNT REG -E300-
                                718
   0F23 0D 00 0F7B 0F79         719        CLC   SS18D-1(1),SS18D-3  DIAGNOSTIC BYTE AS EXPECTED ?
   0F29 F2 01 3A                720        JNE   ER18                JUMP IF NOT.
   0F2C 0D 01 0F81 0F7F         721        CLC   SS18E(2),SS18E-2    STATUS/LENGTH COUNT AS EXPECTED ?
   0F32 F2 01 31                722        JNE   ER18                JUMP IF NOT.
                                723
   0F35 C0 87 0216              724        B     LINK                RETURN TO DCP.
                                725
                                726 * ROUTINE 0C ERROR MESSAGES *
                                727
   0F39 3C 00 0F4F              728 ER18     MVI   SS18A,X'00'         CLEAR DATA TRANSFER REG.
   0F3D C0 87 021A              729        B     PRINT               PRINT SENSE CHECK.
   0F41 C2                0F41  730        DC    XL1'C2'
   0F42 0C                0F42  731        DC    IL1'12'
   0F43 1EAD              0F44  732        DC    AL2(SNSCK)
   0F45 4057              0F46  733        DC    XL2'4057'
                                734
   0F47 C0 87 1699              735        B     ERROR               DUMP THESE REGISTERS-
   0F4B 05                0F4B  736        DC    XL1'05'             DIAGNOSTIC/DATA TRANSFER.
   0F4C 2500              0F4D  737        DC    XL2'2500'           -EXPECTED.
   0F4E 0000              0F4F  738 SS18A  DC    XL2'0000'           -ACTUAL.
   0F50 02                0F50  739        DC    XL1'02'             STATUS/LENGTH COUNT REG.
   0F51 8300              0F52  740        DC    XL2'8300'           -EXPECTED.
   0F53 0000              0F54  741 SS18B  DC    XL2'0000'           -ACTUAL.
   0F55 FF                0F55  742        DC    XL1'FF'
   0F56 C0 87 14EA              743        B     MAPS                POINT TO MAP CHART.
```

4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0F5A 9584                0F58  744          DC    XL2'9584'          -PAGE 958, ENTRY 4.
   0F5C C0 87 0222                745          B     HALT               ERROR HALT -57-.
   0F60 4057                0F61  746          DC    XL2'4057'
   0F62 C0 87 0216                747          B     LINK               RETURN TO DCP.
                                  748
   0F66 3C 00 0F7C                749 ERR18    MVI   SS18D.X'00'        CLEAR DATA TRANS REGISTER.
   0F6A C0 87 021A                750          B     PRINT              PRINT EOT CHECK.
   0F6E C2                  0F6E  751          DC    XL1'C2'
   0F6F 0A                  0F6F  752          DC    IL1'10'
   0F70 1E68                0F71  753          DC    AL2(CKEOT)
   0F72 4058                0F73  754          DC    XL2'4058'
                                  755
   0F74 C0 87 1699                756          B     ERROR              DUMP THESE REGISTERS-
   0F78 05                  0F78  757          DC    XL1'05'            DIAGNOSTIC/DATA TRANS REGISTER.
   0F79 0800                0F7A  758          DC    XL2'0800'          -EXPECTED.
   0F7B 0000                0F7C  759 SS18D    DC    XL2'0000'          -ACTUAL.
   0F7D 02                  0F7D  760          DC    XL1'02'            STATUS/LENGTH COUNT REGISTER.
   0F7E E300                0F7F  761          DC    XL2'E300'          -EXPECTED.
   0F80 0000                0F81  762 SS18E    DC    XL2'0000'          -ACTUAL.
   0F82 FF                  0F82  763          DC    XL1'FF'
   0F83 C0 87 14EA                764          B     MAPS               POINT TO MAP CHART.
   0F87 9585                0F88  765          DC    XL2'9585'          -PAGE 958, ENTRY 5.
   0F89 C0 87 0222                766          B     HALT               ERROR HALT -58-.
   0F8D 4058                0F8E  767          DC    XL2'4058'
   0F8F C0 87 0216                768          B     LINK               RETURN TO DCP.
                                  769
                                  770
                                  771 *********
                                  772 * RTN0D *
                                  773 ***************************************************************************
                                  774 *                                                                         *
                                  775 *       ROUTINE 0D        CHECK DECREMENTING OF DATA ADDRESS REGISTER.     *
                                  776 *                                                                         *
                                  777 ***************************************************************************
   0F93 0D                  0F93  778 RTN0D    DC    XL1'0D'            ROUTINE NUMBER
   0F94 00                  0F94  779          DC    XL1'00'            NO MANUAL INTERVENTION REQUIRED
   0F95 1089                0F96  780          DC    AL2(RTN0E)         ROUTINE 0E ADDRESS.
                                  781
   0F97 C0 87 021A                782          B     PRINT              PRINT DECR THE LCR HEADING.
   0F9B 45                  0F9B  783          DC    XL1'45'
   0F9C 20                  0F9C  784          DC    IL1'32'
   0F9D 1D16                0F9E  785          DC    AL2(MD0D)
   0F9F 40AD                0FA0  786          DC    XL2'40AD'
                                  787
   0FA1 C0 87 145C                788          B     INITL              INITIALIZE THE 3741.
                                  789
   0FA5 C0 87 1511                790          B     QUES               TEST FOR SSW 10.
   0FA9 F0 3C 3C                  791          MPL   X'3C',X'3C'        HALT -FF- IF ON.
                                  792
   0FAC 31 41 1A54                793          LIO   H0482,X'41'        SET FNCT REG FOR 6 USEC RESET.
   0FB0 31 42 1A52                794          LIO   H00F0,X'42'        LOAD -F0- IN LENGTH COUNT REG.
   0FB4 31 45 1A30                795          LIO   H0000,X'45'        CLEAR DATA TRANSFER REGISTER.
   0FB8 31 44 1A62                796          LIO   ADRS,X'44'         LOAD ADDRESS IN DATA ADRS REG.
                                  797
   0FBC F3 41 00                  798          SIO   X'00',X'41'        ISSUE READ CALL START I/O.
   0FBF F3 44 60                  799          SIO   X'60',X'44'        DO 2 CONTROL 2'S TO TRANSFER DATA
   0FC2 F3 44 60                  800          SIO   X'60',X'44'         BYTE.
                                  801
   0FC5 30 44 1025                802          SNS   SS19A,X'44'        SENSE DATA ADDRESS REG.
   0FC9 CD 01 1025 1023           803          CLC   SS19A(2),SS19A-2   DATA ADDRESS REGISTER DECREMENTING ?
   0FCF F2 01 41                  804          JNE   ER19               JUMP IF NOT.
                                  805
   0FD2 F3 44 60                  806          SIO   X'60',X'44'        DO 2 CONTROL 2'S TO TRANSFER ANOTHER
   0FD5 F3 44 60                  807          SIO   X'60',X'44'         DATA BYTE.
                                  808
   0FD8 30 44 1049                809          SNS   SS19B,X'44'        SENSE DATA ADDRESS REGISTER.
   0FDC 30 42 104E                810          SNS   SS19C,X'42'        SENSE STATUS/LENGTH COUNT -81F2-.
                                  811
```


4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0FE0 0D 01 1049 1047           812          CLC   SS19B(2),SS19B-2   DATA ADDRESS REG DECREMENTING ?
   0FE6 F2 01 4E                  813          JNE   ERR19              JUMP IF NOT.
   0FE9 0D 01 104E 104C           814          CLC   SS19C(2),SS19C-2   STATUS/LENGTH COUNT AS EXPECTED ?
   0FEF F2 01 45                  815          JNE   ERR19              JUMP IF NOT.
                                  816
   0FF2 F3 43 04                  817          SIO   X'04',X'43'        DO CONTROL 1 SIO TO CAUSE OVERFLOW.
   0FF5 30 42 1072                818          SNS   SS19D,X'42'        SENSE STATUS/LENGTH COUNT -E1F2-.
   0FF9 30 45 1077                819          SNS   SS19E,X'45'        SENSE DIAGNOSTIC/DATA TRANS-0000-.
                                  820
   0FFD 0D 01 1072 1070           821          CLC   SS19D(2),SS19D-2   STATUS/LENGTH COUNT REG AS EXPECTED?
   1003 F2 01 5A                  822          JNE   ERRR19             JUMP IF NOT.
   1006 0D 01 1077 1075           823          CLC   SS19E(2),SS19E-2   DIAGNOSTIC/DATA TRANS AS EXPECTED ?
   100C F2 01 51                  824          JNE   ERRR19             JUMP IF NOT.
                                  825
   100F C0 87 0216                826          B     LINK               RETURN TO DCP.
                                  827
                                  828 * ROUTINE 0D ERROR MESSAGES *
                                  829
   1013 C0 87 021A                830 ER19     B     PRINT              PRINT DATA ADDRESS REG CHECK.
   1017 C2                  1017  831          DC    XL1'C2'
   1018 1C                  1018  832          DC    IL1'28'
   1019 1B0A                101A  833          DC    AL2(DARCK)
   1018 4059                101C  834          DC    XL2'4059'
                                  835
   101D C0 87 1699                836          B     ERROR              DUMP DATA ADDRESS REGISTER.
   1021 04                  1021  837          DC    XL1'04'
   1022 1997                1023  838          DC    AL2(DADATA-1)      -EXPECTED.
   1024 0000                1025  839 SS19A    DC    XL2'0000'          -ACTUAL.
   1026 FF                  1026  840          DC    XL1'FF'
   1027 C0 87 14EA                841          B     MAPS               POINT TO MAP CHART.
   102B 9601                102C  842          DC    XL2'9601'          -PAGE 960, ENTRY 1.
   102D C0 87 0222                843          B     HALT               ERROR HALT -59-.
   1031 4059                1032  844          DC    XL2'4059'
   1033 C0 87 0216                845          B     LINK               RETURN TO DCP.
                                  846
   1037 C0 87 021A                847 ERR19    B     PRINT              PRINT SENSE CHECK.
   103B C2                  103B  848          DC    XL1'C2'
   103C 0C                  103C  849          DC    IL1'12'
   103D 1EAD                103E  850          DC    AL2(SNSCK)
   103F 405A                1040  851          DC    XL2'405A'
                                  852
   1041 C0 87 1699                853          B     ERROR              DUMP THESE REGISTERS-
   1045 04                  1045  854          DC    XL1'04'            DATA ADDRESS REGISTER.
   1046 1996                1047  855          DC    AL2(DADATA-2)      -EXPECTED.
   1048 0000                1049  856 SS19B    DC    XL2'0000'          -ACTUAL.
   104A 02                  104A  857          DC    XL1'02'            STATUS/LENGTH COUNT REG.
   104B 81F2                104C  858          DC    XL2'81F2'          -EXPECTED.
   104D 0000                104E  859 SS19C    DC    XL2'0000'          -ACTUAL.
   104F FF                  104F  860          DC    XL1'FF'
   1050 C0 87 14EA                861          B     MAPS               POINT TO MAP CHART.
   1054 9602                1055  862          DC    XL2'9602'          -PAGE 960, ENTRY 2.
   1056 C0 87 0222                863          B     HALT               ERROR HALT -5A-.
   105A 405A                1058  864          DC    XL2'405A'
   105C C0 87 0216                865          B     LINK               RETURN TO DCP.
                                  866
   1060 C0 87 021A                867 ERRR19   B     PRINT              PRINT OVERFLOW CHECK.
   1064 C2                  1064  868          DC    XL1'C2'
   1065 0F                  1065  869          DC    IL1'15'
   1066 1EBC                1067  870          DC    AL2(OVRFL)
   1068 405C                1069  871          DC    XL2'405C'
                                  872
   106A C0 87 1699                873          B     ERROR              DUMP THESE REGISTERS-
   106E 02                  106E  874          DC    XL1'02'             AFTER EOT WAS GENERATED.
   106F E1F2                1070  875          DC    XL2'E1F2'          -STATUS-LCR.
   1071 0000                1072  876 SS19D    DC    XL2'0000'          -ACTUAL.
   1073 05                  1073  877          DC    XL1'05'            DIAGNOSTIC/DATA TRANS REGISTER.
   1074 0000                1075  878          DC    XL2'0000'          -EXPECTED.
   1076 0000                1077  879 SS19E    DC    XL2'0000'          -ACTUAL.
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1078 FF               1078  880         DC    XL1'FF'
   1079 C0 87 14EA             881         B     MAPS              POINT TO MAP CHART.
   107D 9603             107E  882         DC    XL2'9603'         -PAGE 960. ENTRY 3.
   107F C0 87 0222             883         B     HALT              ERROR HALT -5C-.
   1083 405C             1084  884         DC    XL2'405C'
   1085 C0 87 0216             885         B     LINK              RETURN TO DCP.
                               886
                               887 *********
                               888 * RTN0E *
                               889 ************************************************************************
                               890 *                                                                      *
                               891 *      ROUTINE 0E          TEST 3741 INTERRUPT CAPABILITY.             *
                               892 *                                                                      *
                               893 ************************************************************************
   1089 0E               1089  894 RTN0E   DC    XL1'0E'           ROUTINE NUMBER
   108A 00               108A  895         DC    XL1'00'           NO MANUAL INTERVENTION REQUIRED
   108B 1398             108C  896         DC    AL2(RTN0F)        ROUTINE OF ADDRESS
                               897
   108D 3D C5 0200             898         CLI   CPU,C'E'          IF IT IS NOT MODEL 15 ...
   1091 C0 01 135F             899         BNE   ADIT                THEN GO TERMINATE
   1095 C0 87 021A             900         B     PRINT             PRINT INTERUPT TEST.
   1099 45               1099  901         DC    XL1'45'
   109A 1C               109A  902         DC    IL1'28'
   109B 1D32             109C  903         DC    AL2(HD0E)
   109D 40AE             109E  904         DC    XL2'40AE'
                               905
   109F C0 87 145C             906         B     INITL             INITIALIZE THE 3741.
                               907
   10A3 C2 01 1EF3             908         LA    ERIAR,XR1         SET UP FOR IAR 5 CHECK.
   10A7 3C 23 17D8             909         MVI   MPIAR,X'23'       SET FOR MAP ENTRY 3.
   10AB 3C 88 17C8             910         MVI   IAR-4,X'88'
   10AF 0C 01 17CA 1A46        911         MVC   IAR-2(2),HAA55
   10B5 C0 87 17A0             912         B     CKIAR             CHECK IAR 5 WITH PATTERN -AA55-.
   10B9 0C 01 17CA 1A4C        913         MVC   IAR-2(2),H55AA
   10BF C0 87 17A0             914         B     CKIAR             CHECK IAR 5 WITH PATTERN -55AA-.
   10C3 0C 01 17CA 1A4E        915         MVC   IAR-2(2),H0107
   10C9 C0 87 17A0             916         B     CKIAR             CHECK IAR 5 WITH PATTERN -0107-.
                               917
                               918 *   THE NEXT INSTRUCTIONS HANDLE A CERTAIN BUG WHICH BEHAVES THUS:
                               919 *   THE IAR 5 IS OR'D WITH THE PROG. LEVEL ARR AND THE RESULT
                               920 *   IS 'BRANCHED' TO BY THE CPU.  THEREFORE, THE PROGRAM CALCULATES
                               921 *   THE VALUE OF THOSE 2 ADDRESSES OR'D TOGETHER.  IT THEN PICKS
                               922 *   UP THE FOUR BYTES AT THAT LOCATION AND SAVES IT IN 'TEMP'.
                               923 *   NEXT, IT MOVES INTO THAT LOACTION A SPECIAL BRANCH
                               924 *   INSTRUCTION (CALLED BRNCH) SO THAT IF THAT BUG EXISTS, THE
                               925 *   BRANCH WILL CATCH IT.  AFTER SUCCESSFUL INTERRUPTING HAS
                               926 *   OCCURRED, THE CODE SAVED IN 'TEMP' IS RESTORED.  THE VALUE
                               927 *   OBTAINED BY THE ORING OF THOSE 2 ADDRESSES HAS 2 REQUIREMENTS:
                               928 *     1. THE OR'D VALUE (INCLUDING ORING OF PARITY BITS) MUST END
                               929 *        UP WITH GOOD PARITY.
                               930 *     2. THE OR'D VALUE MUST BE SOME ADDRESS WHICH IS BEYOND THE
                               931 *        INTERRUPT HANDLING ROUTINE BECAUSE THAT CODE MUST BE
                               932 *        EXECUTABLE WHILE THAT SPECIAL BRANCH IS MOVED IN.
                               933 *
                               934
   10CD 0C 00 10DA 1A67        935         MVC   SET1+1(1),INTR5-1   SET UP TO 'OR' THE ARR AND IAR 5.
   10D3 0C 00 10DE 1A68        936         MVC   SET2+1(1),INTR5
   10D9 3A 00 10E3             937 SET1    SBN   ORIT+2,X'00'      OR THE REGISTER ADDRESSES.
   10DD 3A 00 10E4             938 SET2    SBN   ORIT+3,X'00'
   10E1 C2 01 12F0             939 ORIT    LA    JUMP,XR1      THIS INSTR IS ALTERED.  PUT RESULT INTO XR1
   10E5 1C 03 1994 03          940         MVC   TEMP,3(4,XR1)     SAVE  CONTENTS OF THIS ADDRESS.
   10EA 4C 03 03 1A6C          941         MVC   3(4,XR1),BRNCH    MOVE IN BRANCH.
                               942
   10EF 3B 80 1995             943         SBF   FLAG,X'80'        CLEAR INTERUPT FLAG.
   10F3 35 84 1A68             944         L     INTR5,IAR5        LOAD INTR 5 IAR WITH ADDRESS.
                               945
   10F7 31 44 1A62             946         LIO   ADRS,X'44'        LOAD ADDRESS IN DATA ADDRESS REG.
   10FB 31 42 1A50             947         LIO   H00FF,X'42'       LOAD -FF- IN LENGTH COUNT REG.
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   10FF 31 41 1A48             948         LIO   H0082,X'41'       PUT 3741 IN DIAGNOSTIC MODE.
                               949
   1103 C0 87 1511             950         B     QUES              TEST FOR SSW 10.
   1107 F0 3C 3C               951         MPL   X'3C',X'3C'       HALT -FF- IF ON.
   110A C0 87 12E0             952         B     ADJST
                               953
   FE2D                        954         ORG   X'FFFF'-X'12E0'+8 IF FLAGGED, CODE OVERLAY PROBLEM.
   12E0                        955         ORG   X'12E0'           FORCES ADDR OF JUMP TO HAVE A
                               956 *                               A LARGE VALUE IN ITS RIGHT HAND BYTE
                               957
   12E0 F3 40 02               958 ADJST   SIO   X'02',X'40'       ENABLE INTERUPT.
   12E3 F3 41 00               959         SIO   X'00',X'41'       ISSUE READ CALL.
   12E6 F3 44 C4               960         SIO   X'C4',X'44'       DO 2 CONTROL 2'S TO CAUSE DATA TRAN-
   12E9 F3 44 C4               961         SIO   X'C4',X'44'        SFER AND INTERUPT.
                               962
   12EC C0 87 12F0             963         B     *+4               DO 'NO-OP' BRANCHES TILL INTERUPT.
   12F0 C0 87 12F4             964 JUMP    B     *+4
   12F4 C0 87 12F8             965         B     *+4
   12F8 C0 87 12FC             966         B     *+4
   12FC 38 80 1995             967         TBN   FLAG,X'80'        INTERUPT FLAG SET ?
   1300 F2 90 61               968         JF    ER1A              JUMP IF NOT.
                               969
   1303 C2 01 1F08             970         LA    ERARR,XR1         SET UP FOR ARR CHECK.
   1307 3C 24 17D8             971         MVI   MPIAR,X'24'       SET FOR MAP ENTRY 4.
   130B 3C 08 17C8             972         MVI   IAR-4,X'08'
   130F 0C 01 17CA 1A46        973         MVC   IAR-2(2),HAA55
   1315 C0 87 17A0             974         B     CKIAR             CHECK ARR WITH PATTERN -AA55-.
   1319 0C 01 17CA 1A4C        975         MVC   IAR-2(2),H55AA
   131F C0 87 17A0             976         B     CKIAR             CHECK ARR WITH PATTERN -55AA-.
   1323 0C 01 17CA 1A4E        977         MVC   IAR-2(2),H0107
   1329 C0 87 17A0             978         B     CKIAR             CHECK ARR WITH PATTERN -0107-.
                               979
   132D C0 87 145C             980         B     INITL             GO REINITIALIZE THE 3741.
                               981
   1331 3B 80 1995             982         SBF   FLAG,X'80'        RESET THE INTERRUPT FLAG.
   1335 35 84 1A68             983         L     INTR5,IAR5        RELOAD THE IAR 5 REGISTER.
                               984
   1339 F3 40 12               985         SIO   X'12',X'40'       DO A PROGRAM 3741 INTERRUPT.
                               986
   133C C0 87 1340             987         B     *+4               ALLOW TIME FOR THE INTERRUPT.
   1340 C0 87 1344             988         B     *+4
   1344 C0 87 1348             989         B     *+4
   1348 C0 87 134C             990         B     *+4
                               991
   134C 38 80 1995             992         TBN   FLAG,X'80'        INTERRUPT FLAG GET SET ?
   1350 F2 90 11               993         JF    ER1A              JUMP TO ERROR IF NOT.
                               994
   1353 F3 40 0D               995         SIO   X'0D',X'40'       RESET THE 3741.
   1356 35 01 10E4             996         L     ORIT+3,XR1        PUT OR'ED VALUE BACK INTO XR1
   135A 4C 03 03 1994          997         MVC   3(4,XR1),TEMP     RESTORE SPECIAL ADDRESS CONTENTS.
   135F C0 87 022A             998 ADIT    B     LOAD              TERMINATE SECTION.
   1363 00               1363  999         DC    XL1'00'
                              1000
                              1001 * ROUTINE 0E ERROR MESSAGE *
                              1002
   1364 C0 87 021A            1003 ER1A    B     PRINT             PRINT NO INTERRUPT CHECK.
   1368 C2               1368 1004         DC    XL1'C2'
   1369 17               1369 1005         DC    IL1'23'
   136A 1E7F             136B 1006         DC    AL2(NOINT)
   136C 405E             136D 1007         DC    XL2'405E'
   136E 4C 03 03 1994         1008         MVC   3(4,XR1),TEMP     RESTORE SPECIAL ADDRESS CONTENTS.
   1373 C0 87 14EA            1009         B     MAPS              POINT TO MAP CHART.
   1377 9622             1378 1010         DC    XL2'9622'         -PAGE 962. ENTRY 2.
   1379 C0 87 0222            1011         B     HALT              ERROR HALT -5E-.
   137D 405E             137E 1012         DC    XL2'405E'
   137F C0 87 135F            1013         B     ADIT              TERMINATE SECTION.
                              1014
                              1015 ************************************************************************
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         1016 *      EXPECT INTERRUPT 5 TO BRANCH HERE.                    *
                         1017 ********************************************************************
                         1018
 1383 3A 80 1995         1019 INT5   SBN   FLAG,X'80'          SET INTERRUPT FLAG ON.
 1387 C0 87 138B         1020        B     **4                 DO A BRANCH TO SWITCH ARRS AND IARS.
 1388 30 45 1397         1021        SNS   TEMP1,X'45'         ISSUE SENSE TO TEST FOR PROC CHECK.
 138F F3 40 0D           1022        SIO   X'0D',X'40'         RESET INTERRUPT.RETURN TO MAIN PRGM.
 1392 C0 87 1383         1023        B     INT5
 1396 0000      1397     1024 TEMP1  DC    XL2'0000'           A SAFE PLACE TO SENSE.
                         1025
                         1026 *********
                         1027 * RTN0F *
                         1028 ********************************************************************
                         1029 *                                                                  *
                         1030 *      ROUTINE OF        TEST DATA BYTE TRANSFER. BYTE = A0.       *
                         1031 *                        EXPECT TO GENERATE I/O CHECK.             *
                         1032 *                                                                  *
                         1033 ********************************************************************
 1398 0F        1398     1034 RTN0F  DC    XL1'0F'             ROUTINE NUMBER
 1399 00        1399     1035        DC    XL1'00'             NO MANUAL INTERVENTION REQUIRED
 139A FFFF      1398     1036        DC    XL2'FFFF'           LAST ROUTINE
                         1037
 139C C0 87 021A         1038        B     PRINT               PRINT PARITY TEST HEADING.
 13A0 45        13A0     1039        DC    XL1'45'
 13A1 21        13A1     1040        DC    IL1'33'
 13A2 1D53      13A3     1041        DC    AL2(HD0F)
 13A4 40AF      13A5     1042        DC    XL2'40AF'
                         1043
 13A6 C0 87 145C         1044        B     INITL               INITIALIZE THE 3741.
                         1045
 13AA C0 87 1511         1046        B     QUES                TEST FOR SSW 10.
 13AE F0 3C 3C           1047        HPL   X'3C',X'3C'         HALT -FF- IF IN.
                         1048
 13B1 31 41 1A34         1049        LIO   H0002,X'41'         SET FNCT REG TO 6 USEC RESET.
 13B5 31 42 1A52         1050        LIO   H00F0,X'42'         LOAD -F0- IN LENGTH COUNT.
 13B9 31 44 1A62         1051        LIO   ADRS,X'44'          LOAD ADDRESS IN DATA ADRS REG.
 13BD 31 41 1A40         1052        LIO   H0080,X'41'         PUT 3741 IN DIAGNOSTIC MODE.
                         1053
 13C1 F3 41 00           1054        SIO   X'00',X'41'         ISSUE SIO READ CALL.
 13C4 F3 44 C8           1055        SIO   X'C8',X'44'         DO 2 CONTROL 2'S TO TRANSFER DATA
 13C7 F3 44 C8           1056        SIO   X'C8',X'44'          AND CAUSE BAD PARITY.
                         1057
 13CA 30 42 1424         1058        SNS   SS0FA,X'42'         DUMMY SENSE TO STALL
 13CE 30 42 1424         1059        SNS   SS0FA,X'42'         SENSE STATUS/LENGTH COUNT -C9F1-.
 13D2 F3 43 04           1060        SIO   X'04',X'43'          FORCE EOT
 13D5 0D 01 1424 1422    1061        CLC   SS0FA(2),SS0FA-2    STATUS/LENGTH COUNT AS EXPECTED ?
 13D8 F2 01 34           1062        JNE   ER0F1               JUMP IF NOT.
                         1063
 13DE 30 43 1449         1064        SNS   SS0FB,X'43'         SENSE I/O TRANSFER LINES -F8A2-.
 13E2 0D 01 1449 1447    1065        CLC   SS0FB(2),SS0FB-2    I/O TRANS LINES AS EXPECTED ?
 13E8 F2 01 4C           1066        JNE   ER0F2               JUMP IF NOT.
                         1067
 13EB F3 40 0D           1068 CONV   SIO   X'0D',X'40'         DO GENERAL 3741 RESET.
 13EE C1 40 13F7         1069        TIO   NTRST,X'40'         BRANCH IF 3741 NOT MADE READY.
                         1070
 13F2 C0 87 022A         1071        B     LOAD                TERMINATE SECTION.
 13F6 00        13F6     1072        DC    XL1'00'
                         1073
                         1074 * ROUTINE OF ERROR MESSAGES *
                         1075
 13F7 C0 87 021A         1076 NTRST  B     PRINT               PRINT 3741 NOT RESET.
 13F8 C2        13FB     1077        DC    XL1'C2'
 13FC 12        13FC     1078        DC    IL1'18'
 13FD 1BFE      13FE     1079        DC    AL2(NORDY)
 13FF 4060      1400     1080        DC    XL2'4060'
 1401 C0 87 14EA         1081        B     MAPS                POINT TO MAP CHART.
 1405 9644      1406     1082        DC    XL2'9644'           -PAGE 964, ENTRY 4.
 1407 C0 87 0222         1083        B     HALT                ERROR HALT -60-.
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
 1408 4060      140C     1084        DC    XL2'4060'
 140D C0 87 022A         1085        B     LOAD                TERMINATE SECTION.
 1411 00        1411     1086        DC    XL1'00'
                         1087
 1412 C0 87 021A         1088 ER0F1  B     PRINT               PRINT SENSE CHECK.
 1416 C2        1416     1089        DC    XL1'C2'
 1417 0C        1417     1090        DC    IL1'12'
 1418 1EAD      1419     1091        DC    AL2(SNSCK)
 141A 4061      141B     1092        DC    XL2'4061'
                         1093
 141C C0 87 1699         1094        B     ERROR               DUMP STATUS/LENGTH COUNT REG.
 1420 02        1420     1095        DC    XL1'02'
 1421 C9F1      1422     1096        DC    XL2'C9F1'           -EXPECTED.
 1423 0000      1424     1097 SS0FA  DC    XL2'0000'           -ACTUAL.
 1425 FF        1425     1098        DC    XL1'FF'
 1426 C0 87 14EA         1099        B     MAPS                POINT TO MAP CHART.
 142A 9641      142B     1100        DC    XL2'9641'           -PAGE 964, ENTRY 1.
 142C C0 87 0222         1101        B     HALT                ERROR HALT -61-.
 1430 4061      1431     1102        DC    XL2'4061'
 1432 C0 87 022A         1103        B     LOAD                TERMINATE SECTION.
 1436 0C        1436     1104        DC    XL1'00'
                         1105
 1437 C0 87 021A         1106 ER0F2  B     PRINT               PRINT TRANSFER LINE CHECK.
 143B C2        143B     1107        DC    XL1'C2'
 143C 18        143C     1108        DC    IL1'24'
 143D 1ESE      143E     1109        DC    AL2(TRLCK)
 143F 4062      1440     1110        DC    XL2'4062'
                         1111
 1441 C0 87 1699         1112        B     ERROR               DUMP I/O TRANSFER LINES.
 1445 03        1445     1113        DC    XL1'03'
 1446 F8A2      1447     1114        DC    XL2'F8A2'           -EXPECTED.
 1448 0000      1449     1115 SS0FB  DC    XL2'0000'           -ACTUAL.
 144A FF        144A     1116        DC    XL1'FF'
 144B C0 87 14EA         1117        B     MAPS                POINT TO MAP CHART.
 144F 9642      1450     1118        DC    XL2'9642'           -PAGE 964, ENTRY 2.
 1451 C0 87 0222         1119        B     HALT                ERROR HALT -62-.
 1455 4062      1456     1120        DC    XL2'4062'
 1457 C0 87 022A         1121        B     LOAD                TERMINATE SECTION.
 145B 00        145B     1122        DC    XL1'00'
                         1123
                         1124
```

4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                               1126 ***********************************************************************
                               1127 * INITL *                                                             *
                               1128 *********                 THIS SUBROUTINE INITIALIZES THE 3741        *
                               1129 *                         BEFORE A TEST ROUTINE IS EXECUTED.          *
                               1130 *                                                                     *
                               1131 ***********************************************************************
    145C 34 08 1476            1132 INITL  ST    INTL+3.ARR           SAVE RETURN ADDRESS.
    1460 31 41 1A40            1133        LIO   H0080.X'41'          SET FUNCTION REG TO DIAGNOSTIC MODE
    1464 31 42 1A30            1134        LIO   H0000.X'42'          ZERO LENGTH COUNT REGISTER.
    1468 31 45 1A30            1135        LIO   H0000.X'45'          ZERO DATA TRANSFER REGISTER.
    146C F3 40 0D              1136        SIO   X'0D'.X'40'          DO GENERAL SIO RESET TO 3741.
    146F C1 40 1477            1137        TIO   NTRDY.X'40'          MAKE SURE 3741 IS READY BEFORE TEST.
    1473 C0 87 0000            1138 INTL   B     *-*
                               1139
                               1140 ***********************************************************************
                               1141 * TIOERS *                                                            *
                               1142 **********               SUBROUTINE PRINTS OUT TIO ERRORS.            *
                               1143 *                                                                     *
                               1144 ***********************************************************************
    1477 C0 87 021A            1145 NTRDY  B     PRINT                PRINT 3741 IS NOT READY.
    147B C2               147B 1146        DC    XL1'C2'
    147C 12               147C 1147        DC    IL1'18'
    147D 1BFE             147E 1148        DC    AL2(NORDY)
    147F 403E             1480 1149        DC    XL2'403E'
    1481 C0 87 14EA            1150        B     MAPS                 POINT TO MAP CHART.
    1485 9071             1486 1151        DC    XL2'9071'            -PAGE 907. ENTRY 1.
    1487 C0 87 0222            1152        B     HALT                 ERROR HA/T -3E-.
    148B 403E             148C 1153        DC    XL2'403E'
    148D C0 87 0216            1154        B     LINK                 RETURN TO DCP.
                               1155
    1491 C0 87 021A            1156 BUSY   B     PRINT                PRINT 3741 IS BUSY.
    1495 C2               1495 1157        DC    XL1'C2'
    1496 0D               1496 1158        DC    IL1'13'
    1497 1C0B             1498 1159        DC    AL2(BISY)
    1499 403F             149A 1160        DC    XL2'403F'
    149B C0 67 14EA            1161        B     MAPS                 POINT TO MAP CHART.
    149F 9522             14A0 1162        DC    XL2'9522'            -PAGE 952. ENTRY 2.
    14A1 C0 87 0222            1163        B     HALT                 ERROR HALT -3F-.
    14A5 403F             14A6 1164        DC    XL2'403F'
    14A7 C0 87 0216            1165        B     LINK                 RETURN TO DCP.
                               1166
    14AB C0 87 021A            1167 NTBSY  B     PRINT                PRINT 3741 IS NOT BUSY.
    14AF C2               14AF 1168        DC    XL1'C2'
    14B0 11               14B0 1169        DC    IL1'17'
    14B1 1DF0             14B2 1170        DC    AL2(NOTSC)
    14B3 4066             14B4 1171        DC    XL2'4066'
    14B5 C0 87 14EA            1172        B     MAPS                 POINT TO MAP CHART.
    14B9 9521             14BA 1173        DC    XL2'9521'            -PAGE 952. ENTRY 1.
    14BB C0 87 0222            1174        B     HALT                 ERROR HALT -66-.
    14BF 4066             14C0 1175        DC    XL2'4066'
    14C1 C0 87 0216            1176        B     LINK                 RETURN TO DCP.
                               1177
                               1178 ***********************************************************************
                               1179 * XPRNTX *                                                            *
                               1180 **********               SUBROUTINE SETS UP ERROR PRINTING.           *
                               1181 *                                                                     *
                               1182 ***********************************************************************
    14C5 34 08 14E9            1183 EPRNT1 ST    PRTT+3.ARR           STORE RETURN ADDRESS.
    14C9 3C 81 14DC            1184        MVI   LINE.X'81'           SET UP TO SPACE 1 LINE.
    14CD F2 87 08              1185        J     PRNT
    14D0 34 08 14E9            1186 EPRNT2 ST    PRTT+3.ARR           STORE RETURN ADDRESS.
    14D4 3C 82 14DC            1187        MVI   LINE.X'82'           SET UP TO SPACE 2 LINES.
    14D8 C0 87 021A            1188 PRNT   B     PRINT                PRINT THE ERROR MESSAGE IN 'PRT'.
    14DC 00               14DC 1189 LINE   DC    XL1'00'
    14DD 5B               14DD 1190        DC    IL1'91'
    14DE 1F77             14DF 1191        DC    AL2(PRT)
    14E0 0C 5A 1F77 1F78       1192        MVC   PRT(91).PRT+1        CLEAR ERROR MESSAGE AREA.
    14E6 C0 87 0000            1193 PRTT   B     *-*                  RETURN TO ROUTINE.
```


4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                               1195 ***********************************************************************
                               1196 * MAPS *                                                              *
                               1197 ********                THE MAP CHART REFERENCE IS PRINTED.           *
                               1198 *                                                                     *
                               1199 ***********************************************************************
    14EA 34 08 1994            1200 MAPS   ST    TEST.ARR             STORE THE ARR ADDRESS.
    14EE 35 01 1994            1201        L     TEST.XR1             LOAD XR1 WITH ARR ADDRESS.
    14F2 18 02 1C22 00         1202        MNZ   MAPSS-11.0(.XR1)     LOAD HUNDREDS DIGIT FOR PAGE #.
    14F7 18 03 1C23 00         1203        MNN   MAPSS-10.0(.XR1)     LOAD TENS DIGIT FOR PAGE #.
    14FC 18 02 1C24 01         1204        MNZ   MAPSS-9.1(.XR1)      LOAD UNITS DIGIT FOR PAGE #.
    1501 18 03 1C2C 01         1205        MNN   MAPSS-1.1(.XR1)      LOAD ENTRY NUMBER.
    1506 C0 87 021A            1206        B     PRINT                PRINT GO TO MAP CHART XX.
    150A 86               150A 1207        DC    XL1'86'
    150B 22               150B 1208        DC    IL1'34'
    150C 1C2D             150D 1209        DC    AL2(MAPSS)
                               1210
    150E D0 87 02              1211        B     2(.XR1)              RETURN TO ROUTINE.
                               1212
                               1213 ***********************************************************************
                               1214 * QUES *                                                              *
                               1215 ********              SUBROUTINE DETERMINES IF SSW 10 IS ON.          *
                               1216 *                                                                     *
                               1217 ***********************************************************************
    1511 34 08 1525            1218 QUES   ST    QS+3.ARR             STORE RETURN ADDRESS.
    1515 38 80 020A            1219        TBN   SBYTE2.SSW10         SSW 10 ON ?
    1519 F2 10 0A              1220        JT    QST                  RETURN TO PRGM HALT IF YES.
    151C 0E 01 1525 1A36       1221        ALC   QS+3(2).N003         INCR RETURN TO SKIP HALT.
    1522 C0 87 0000            1222 QS     B     *-*                  RETURN TO ROUTINE.
                               1223
    1526 3D C2 0200            1224 QST    CLI   X'0200'.X'C2'        IS THIS A MODEL B SYSTEM ?
    152A C0 01 1522            1225        BNE   QS                   DO NORMAL HALT IF NOT.
    152E 35 01 1525            1226        L     QS+3.XR1             SET UP MODEL B HALT -FF-.
    1532 4C 01 02 1A3E         1227        MVC   2(2.XR1).MFFF8
    1537 C0 87 1522            1228        B     QS                   GO HALT.
                               1229
                               1230 ***********************************************************************
                               1231 * CKPAT *                                                             *
                               1232 *********               SUBROUTINE COMPARES ACTUAL SENSE              *
                               1233 *                       PATTERN VS A TABLE OF EXPECTED                *
                               1234 *                       PATTERNS AND PRINTS THE CORRS ERROR           *
                               1235 *                       MESSAGE.                                      *
                               1236 *                                                                     *
                               1237 ***********************************************************************
    153B 34 08 1560            1238 CKPAT  ST    PATCK+3.ARR          STORE RETURN ADDRESS.
    153F C2 01 199A            1239        LA    PATRN.XR1          * STORE PATTERN TABLE ADDRS.
                               1240
    1543 4D 05 06 1994         1241 CKS    CLC   6(6.XR1).TEST        COMPARE TABLE PATTERN VS ACTUAL.
    1548 F2 01 16              1242        JNE   TRY                  JUMP IF NO COMPARE.
                               1243
    154B 18 02 1EC8 07         1244        MNZ   MSS-2.7(.XR1)        STORE TENS DIGIT OF MESSAGE ID.
    1550 18 03 1EC9 07         1245        MNN   MSS-1.7(.XR1)        STORE UNITS DIGIT OF MESSAGE ID.
    1555 C0 87 021A            1246 ERMS   B     PRINT                PRINT CORRS ERROR MESSAGE.
    1559 82               1559 1247        DC    XL1'82'
    155A 0E               155A 1248        DC    IL1'14'
    155B 1ECA             155C 1249        DC    AL2(MSS)
    155D C0 87 0000            1250 PATCK  B     *-*                  RETURN TO ROUTINE.
                               1251
    1561 36 01 1A3A            1252 TRY    A     N007.XR1             INCREMENT THE TABLE POINTERS.
    1565 7D FF 01              1253        CLI   1(.XR1).X'FF'        END OF TABLE YET ?
    1568 C0 01 1543            1254        BNE   CKS                  CONTINUE IF NOT.
                               1255
    156C 0C 01 1EC9 1A6E       1256        MVC   MSS-1(2).C21         SET UP ID FOR NO PATTERN.
    1572 C0 87 1555            1257        B     ERMS                 GO PRINT THIS.
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1259 ********************************************************************************
                         1260 * CMPARE *                                                                     *
                         1261 **********          EXPECTED EB1 & EB2 BYTES ARE COMPARED                      *
                         1262 *                    AND ERROR BITS ARE IDENTIFIED BY A -*-                    *
                         1263 *                    IN THE OUTPUT AREA.                                       *
                         1264 *                                                                              *
                         1265 ********************************************************************************
 1576 0000               1577 1266 XPT    DC    XL2'0000'          EXPECTED EB1 & EB2 BYTES.
 1578 0000               1579 1267 ACT    DC    XL2'0000'          ACTUAL EB1 & EB2 BYTES.
                              1268
 157A 34 08 15D5              1269 CMPARE ST    CMPR+3,ARR         STORE RETURN ADDRESS.
 157E 34 02 160D              1270        ST    TAERR+3,XR2        INITIALIZE OUTPUT ADDRESSES.
 1582 34 01 1615              1271        ST    TBERR+3,XR1
 1586 3C 01 159F              1272        MVI   TA3+1,X'01'        INITIALIZE BIT POINTERS.
 158A 3C 01 15A6              1273        MVI   TA2+1,X'01'
 158E 3C 01 15B0              1274        MVI   TA1+1,X'01'
 1592 3C 01 15B7              1275        MVI   TB3+1,X'01'
 1596 3C 01 15BE              1276        MVI   TB2+1,X'01'
 159A 3C 01 15C8              1277        MVI   TB1+1,X'01'
                              1278
 159E 38 01 1576              1279 TA3    TBN   XPT-1,X'01'        EXPECTED BIT ON IN EB2 BYTE ?
 15A2 F2 10 0A                1280        JT    TA1                JUMP IF YES.
 15A5 38 01 1578              1281 TA2    TBN   ACT-1,X'01'        ACTUAL BIT ON IN EB2 BYTE ?
 15A9 F2 10 5E                1282        JT    TAERR              GO PUT AN -*- IN OUTPUT IF OFF.
 15AC F2 87 07                1283        J     TB3                CHECK EB1 BYTE.
                              1284
 15AF 38 01 1578              1285 TA1    TBN   ACT-1,X'01'        ACTUAL BIT ON IN EB2 BYTE ?
 15B3 F2 90 54                1286        JF    TAERR              GO PUT AN -*- IN OUTPUT IF SO.
                              1287
 15B6 38 01 1577              1288 TB3    TBN   XPT,X'01'          EXPECTED BIT ON IN EB1 BYTE ?
 15BA F2 10 0A                1289        JT    TB1                JUMP IF SO.
 15BD 38 01 1579              1290 TB2    TBN   ACT,X'01'          ACTUAL BIT ON IN EB1 BYTE ?
 15C1 F2 10 4E                1291        JT    TBERR              GO PUT AN -*- IN OUTPUT IF SO.
 15C4 F2 87 07                1292        J     TC                 CONTINUE ANALYSIS.
                              1293
 15C7 38 01 1579              1294 TB1    TBN   ACT,X'01'          ACTUAL BIT ON IN EB1 BYTE ?
 15CB F2 90 44                1295        JF    TBERR              GO PUT AN -*- IN OUTPUT IF OFF.
                              1296
 15CE 38 80 15C8              1297 TC     TBN   TB1+1,X'80'        BIT 0 BEEN TESTED ?
 15D2 C0 10 0000              1298 CMPR   BT    *-*                RETURN IF SO.
 15D6 0E 00 15B0 15B0         1299        ALC   TA1+1(1),TA1+1     INCREMENT BIT POINTERS.
 15DC 0E 00 15A6 15A6         1300        ALC   TA2+1(1),TA2+1
 15E2 0E 00 159F 159F         1301        ALC   TA3+1(1),TA3+1
 15E8 0E 00 15C8 15C8         1302        ALC   TB1+1(1),TB1+1
 15EE 0E 00 15BE 15BE         1303        ALC   TB2+1(1),TB2+1
 15F4 0E 00 15B7 15B7         1304        ALC   TB3+1(1),TB3+1
 15FA 0F 01 160D 1A34         1305        SLC   TAERR+3(2),N002    DECREMENT OUTPUT ADDRESSES.
 1600 0F 01 1615 1A34         1306        SLC   TBERR+3(2),N002
 1606 C0 87 159E              1307        B     TA3                GO CHECK NEW BIT.
                              1308
 160A 3C 5C 0000              1309 TAERR  MVI   *-*,X'5C'          PUT -*- IN EB2 OUTPUT.
 160E C0 87 1586              1310        B     TB3                CONTINUE CHECK.
 1612 3C 5C 0000              1311 TBERR  MVI   *-*,X'5C'          PUT -*- IN EB1 OUTPUT.
 1616 C0 87 15CE              1312        B     TC                 CONTINUE CHECK.
                              1313
                              1314 ********************************************************************************
                              1315 * BITSNF *                                                                   *
                              1316 **********          THE EB1 & 2 BYTES ARE CONVERTED TO                      *
                              1317 *                    A PRINTABLE BINARY FORM.                                *
                              1318 *                                                                            *
                              1319 ********************************************************************************
 161A 00.                161A 1320 EB2T   DC    XL1'00'            TEMPORARY STORAGE FOR EB2 & EB1
 1618 00                 161B 1321 EB1T   DC    XL1'00'            BYTES.
                              1322
 161C 36 08 1A32              1323 BITSNF A     N001,ARR
 1620 34 08 1629              1324        ST    *+9,ARR
 1624 0C 01 162F 0000         1325        MVC   *+11(2),*-*
 162A 0C 01 161B 0000         1326        MVC   EB1T(2),*-*        STORE EB1 & EB2 BYTES.
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1630 36 08 1A32              1327        A     N001,ARR
 1634 34 08 167B              1328        ST    BTNF+3,ARR         STORE RETURN ADDRESS.
 1638 3C 01 1649              1329        MVI   TNF+1,X'01'        INITIALIZE BIT POINTERS.
 163C 3C 01 165F              1330        MVI   TNFF+1,X'01'
 1640 34 02 165D              1331        ST    NF+3,XR2           STORE OUTPUT ADDRESSES.
 1644 34 01 1673              1332        ST    NFF+3,XR1
                              1333
 1648 38 00 161A              1334 TNF    TBN   EB2T,X'00'         THIS BIT ON IN EB2 ?
 164C F2 10 07                1335        JT    ITSON              JUMP IF SO.
 164F 3C F0 1658              1336        MVI   NF+1,X'F0'         MOVE IN A -0-.
 1653 F2 87 04                1337        J     NF
 1656 3C F1 1658              1338 ITSON  MVI   NF+1,X'F1'         MOVE IN A -1-.
 165A 3C 00 0000              1339 NF     MVI   *-*,X'00'          PUT 1/0 IN OUTPUT.
                              1340
 165E 38 00 1618              1341 TNFF   TBN   EB1T,X'00'         THIS BIT ON IN EB1 ?
 1662 F2 10 07                1342        JT    ITON               JUMP IF SO.
 1665 3C F0 1671              1343        MVI   NFF+1,X'F0'        MOVE IN A -0-.
 1669 F2 87 04                1344        J     NFF
 166C 3C F1 1671              1345 ITON   MVI   NFF+1,X'F1'        MOVE IN A -1-.
 1670 3C 00 0000              1346 NFF    MVI   *-*,X'00'          PUT 1/0 IN OUTPUT.
                              1347
 1674 38 80 1649              1348        TBN   TNF+1,X'80'        CHECKED BIT 0 ?
 1678 C0 10 0000              1349 BTNF   BT    *-*                RETURN IF SO.
 167C 0E 00 1649 1649         1350        ALC   TNF+1(1),TNF+1     INCREMENT BIT POINTERS.
 1682 0E 00 165F 165F         1351        ALC   TNFF+1(1),TNFF+1
 1688 0F 01 165D 1A34         1352        SLC   NF+3(2),N002       DECREMENT OUTPUT ADRS.
 168E 0F 01 1673 1A34         1353        SLC   NFF+3(2),N002
 1694 C0 87 1648              1354        B     TNF                CONTINUE CHECK.
                              1355
                              1356 ********************************************************************************
                              1357 * ERROR *                                                                    *
                              1358 *********          SUBROUTINE IDENTIFIES SENSE BYTE AND                    *
                              1359 *                  PRINTS ITS STATUS WHILE IDENTIFYING                     *
                              1360 *                  THE BITS IN ERROR. SUBROUTINE CALLED                    *
                              1361 *                  BY -                                                    *
                              1362 *                       B    ERROR                                         *
                              1363 *                       DC   XL1'N CODE IN HEX'                            *
                              1364 *                       DC   XL2'EXPECTED DATA'                            *
                              1365 *                       DC   XL2'ACTUAL DATA'                              *
                              1366 *                       DC   XL1'ANOTHER N CODE'                           *
                              1367 *                       DC   XL2'EXPECTED DATA'                            *
                              1368 *                       DC   XL2'ACTUAL DATA'                              *
                              1369 *                       DC   XL1'A -FF- DESIGNATES END'                    *
                              1370 *                                                                          *
                              1371 ********************************************************************************
 1698 00                 1698 1372 NCOD   DC    XL1'00'            CURRENT N CODE STORAGE.
 1699 34 08 16A0              1373 ERROR  ST    **7,ARR            STORE RETURN ADDRESS IN XR1.
 169D C2 01 0000              1374        LA    *-*,XR1
 16A1 34 01 16AA              1375 CKIT   ST    **9,XR1
 16A5 0C 00 1698 0000         1376        MVC   NCOD(1),*-*        BRING IN N CODE FOR CHECKING.
 16AB 3D FF 1698              1377        CLI   NCOD,X'FF'
 16AF F2 81 E2                1378        JE    CKOUT              EXIT IF DETECTED 'END FLAG'.
                              1379
 16B2 0C 5A 1F77 1F78         1380        MVC   PRT(91),PRT+1      BLANK PRINT BUFFER
 16B8 3D 01 1698              1381        CLI   NCOD,X'01'         IDENTIFY AND SET-UP BYTE HEADING.
 16BC F2 01 06                1382        JNE   **9
 16BF 0C 10 1F52 1AC1         1383        MVC   PRT-37(17),NCD1    * FUNCTION.
 16C5 3D 02 1698              1384        CLI   NCOD,X'02'
 16C9 F2 01 0C                1385        JNE   *+15
 16CC 0C 0A 1F44 1ACC         1386        MVC   PRT-51(11),NCD2A   * STATUS-LCR.
 16D2 0C 0F 1F58 1ADC         1387        MVC   PRT-28(16),NCD2B
 16D8 3D 03 1698              1388        CLI   NCOD,X'03'
 16DC F2 01 06                1389        JNE   **9
 16DF 0C 11 1F53 1AEE         1390        MVC   PRT-36(18),NCD3    * I/O TRANSFER LINES.
 16E5 3D 04 1698              1391        CLI   NCOD,X'04'
 16E9 F2 01 06                1392        JNE   *+9
 16EC 0C 14 1F54 1B03         1393        MVC   PRT-35(21),NCD4    * DATA ADDRESS.
 16F2 3D 05 1698              1394        CLI   NCOD,X'05'
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   16F6 F2 01 0C             1395         JNE   *+15
   16F9 0C 0E 1F46 1B19      1396         MVC   PRT-42(15),NCD5A    * DIAGNOSTIC-DTR.
   16FF 0C 10 1F5B 1B2A      1397         MVC   PRT-28(17),NCD5B
   1705 3D 08 1698           1398         CLI   NCOD,X'08'
   1709 F2 01 06             1399         JNE   *+9
   170C 0C 0B 1F50 1EFF      1400         MVC   PRT-39(12),NCD08    * ARR REGISTER.
   1712 3D 88 1698           1401         CLI   NCOD,X'88'
   1716 F2 01 06             1402         JNE   *+9
   1719 0C 0D 1F51 1EEC      1403         MVC   PRT-38(14),NCD88    * IAR 5 REGISTER.
   171F C0 87 14D0           1404         B     EPRNT2              PRINT BYTE ID'S.
                             1405
   1723 0C 09 1F43 1B74      1406         MVC   PRT-52(10),EB2      BUILD EB BYTE HEADINGS.
   1729 0C 09 1F57 1B7E      1407         MVC   PRT-32(10),EB1
   172F C0 87 14C5           1408         B     EPRNT1              PRINT EB BYTE HEADINGS.
   1733 0C 0E 1F46 1B6A      1409         MVC   PRT-49(15),BITS     BUILD BIT LABLE HEADINGS.
   1739 0C 0E 1F5A 1B6A      1410         MVC   PRT-29(15),BITS
   173F C0 87 14D0           1411         B     EPRNT2              PRINT BIT LABLE HEADINGS.
   1743 36 01 1A34           1412         A     N002,XR1
   1747 34 01 1750           1413         ST    *+9,XR1
   174B 0C 01 1577 0000      1414         MVC   XPT(2),*-*          STORE EXPECTED BYTES.
   1751 36 01 1A34           1415         A     N002,XR1
   1755 34 01 175E           1416         ST    *+9,XR1
   1759 0C 01 1579 0000      1417 XYR1    MVC   ACT(2),*-*          STORE ACTUAL BYTES.
                             1418
   175F C2 02 1F46           1419         LA    PRT-49,XR2          STORE OUTPUT ADDRESSES.
   1763 C2 01 1F5A           1420         LA    PRT-29,XR1
   1767 C0 87 161C           1421         B     BITSNF              GO CALCULATE STATUS OF ACTUAL BYTES.
   176B 1579           176C  1422         DC    AL2(ACT)
   176D C0 87 14C5           1423         B     EPRNT1              PRINT STATUS/REGISTER ID.
   1771 0D 01 1577 1579      1424         CLC   XPT(2),ACT          EXPECTED AND ACTUAL EQUAL ?
   1777 F2 81 0A             1425         JE    SKPER               JUMP IF SO.
   177A 0C 0A 1F33 1A80      1426         MVC   PRT-68(11),ERS
   1780 C0 87 157A           1427         B     CMPARE              GO CALCULATE ERROR BITS.
   1784 C0 87 14D0           1428 SKPER   B     EPRNT2              PRINT ERROR BITS.
                             1429
   1788 35 01 175E           1430         L     XYR1+5,XR1          RESTORE XR1.
   178C 36 01 1A32           1431         A     N001,XR1
   1790 C0 87 16A1           1432         B     CKIT                GO CHECK FOR NEXT BYTE.
   1794 36 01 1A32           1433 CKOUT   A     N001,XR1            INCREMENT RETURN ADDRESS.
   1798 34 01 179F           1434         ST    *+7,XR1             RETURN TO ROUTINE.
   179C C0 87 0000           1435         B     *-*
                             1436
                             1437 ********************************************************************************
                             1438 * CKIAR *                                                                      *
                             1439 *********                LOAD AND SENSE IAR 5 OR ARR REGISTERS.          *
                             1440 *                                                                              *
                             1441 ********************************************************************************
   17A0 34 08 17B5           1442 CKIAR   ST    CKCK+3,ARR          STORE RETURN ADDRESS.
   17A4 35 84 17CA           1443         L     IAR-2,IAR5          LOAD IAR5/ARR WITH TEST PATTERN.
   17A8 34 84 17CC           1444         ST    IAR,IAR5            STORE REGISTER.
                             1445
   17AC 0D 01 17CC 17CA      1446         CLC   IAR(2),IAR-2        REGISTER AS EXPECTED ?
   17B2 C0 81 0000           1447 CKCK    BE    *-*                 RETURN TO MAIN PROGRAM IF SO.
   17B6 34 01 17C1           1448         ST    THEADR,XR1          STORE ERROR MESSAGE ADDRESS.
                             1449
   17BA C0 87 021A           1450         B     PRINT               PRINT IAR5/ARR CHECK.
   17BE C2             17BE  1451         DC    XL1'C2'
   17BF 15             17BF  1452         DC    IL1'21'
   17C0 0000           17C1  1453 THEADR  DC    AL2(*-*)
   17C2 4068           17C3  1454         DC    XL2'4068'
                             1455
   17C4 C0 87 1699           1456         B     ERROR               DUMP IAR5 OR ARR REGISTER.
   17C8 00             17C8  1457         DC    XL1'00'
   17C9 0000           17CA  1458         DC    XL2'0000'           -EXPECTED.
   17CB 0000           17CC  1459 IAR     DC    XL2'0000'           -ACTUAL.
   17CD FF             17CD  1460         DC    XL1'FF'
   17CE 4C 03 03 1994        1461         MVC   3(4,XR1),TEMP       RESTORE SPECIAL ADDRESS CONTENTS.
   17D3 C0 87 14EA           1462         B     MAPS                POINT TO MAP CHART.
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   17D7 9621           17D8  1463 MPIAR  DC    XL2'9621'           -PAGE 962. ENTRY 1.
   17D9 C0 87 0222           1464         B     HALT                ERROR HALT -68-.
   17DD 4068           17DE  1465         DC    XL2'4068'
   17DF C0 87 135F           1466         B     ADIT                TERMINATE SECTION.
                             1467
                             1468 ********************************************************************************
                             1469 * CRCK *                                                                      *
                             1470 ********                SUBROUTINE PRINTS -OR- CHECK.                     *
                             1471 *                                                                            *
                             1472 ********************************************************************************
   17E3 C0 87 021A           1473 ORCK    B     PRINT               PRINT -OR- CHECK.
   17E7 C2             17E7  1474         DC    XL1'C2'
   17E8 14             17E8  1475         DC    IL1'20'
   17E9 1F1C           17EA  1476         DC    AL2(ORRD)
   17EB 4069           17EC  1477         DC    XL2'4069'
   17ED 4C 03 03 1994        1478         MVC   3(4,XR1),TEMP       RESTORE SPECIAL ADDRESS CONTENTS.
   17F2 C0 87 14EA           1479         B     MAPS                POINT TO MAP CHART.
   17F6 3801           17F7  1480         DC    XL2'3801'           -PAGE 380. ENTRY 1.
   17F8 C0 87 0222           1481         B     HALT                ERROR HALT -69-.
   17FC 4069           17FD  1482         DC    XL2'4069'
   17FE C0 87 135F           1483         B     ADIT                TERMINATE SECTION.
                             1484
                             1485 ********************************************************************************
                             1486 * DATA *                                                                      *
                             1487 ********                THIS SUBROUTINE CAUSES ONE BYTE OF DATA           *
                             1488 *                       TO TRANSFER. PARAMETERS ARE SPECIFIED AS           *
                             1489 *                       FOLLOWS-                                           *
                             1490 *                                                                          *
                             1491 *                            B    DATA                                   *
                             1492 *                            DC   XL1'CONTROL CODE FOR SIO CONTROL 2'*   *
                             1493 *                            DC   XL2'EXPECTED DTR'                      *
                             1494 *                            DC   XL2'EXPECTED LCR'                      *
                             1495 *                            DC   XL2'SENSE CHECK MAP REF'               *
                             1496 *                            DC   XL2'ROUTINE HALT CODES'                *
                             1497 *                                                                        *
                             1498 ********************************************************************************
   1802 00                   1802 1499 CCSIO2 DC    XL1'00'             SIO CONTROL 2 CODE.
   1803 0000                 1804 1500 XPDTR  DC    XL2'0000'           EXPECTED DIAG-DTR BYTES.
   1805 0000                 1806 1501 XPLCR  DC    XL2'0000'           EXPECTED STATUS-LCR BYTES.
   1807 0000                 1808 1502 MPREF  DC    XL2'0000'           SENSE CHECK MAP REF.
   1809 0000                 180A 1503 RTHLT  DC    XL2'0000'           HALT CODES.
                             1504
   180B 36 08 1A3C           1505 DATA    A     N008,ARR
   180F 34 08 1818           1506         ST    DATA1+5,ARR
   1813 0C 08 180A 0000      1507 DATA1   MVC   RTHLT(9),*-*           STORE THE ABOVE DATA.
   1819 0C 01 1984 1808      1508         MVC   MPER(2),MPREF         STORE SENSE CK MAP REFERENCE.
   181F 08 03 1837 0A03      1509         MNN   MDNGID,RTN#           BUILD MESSAGE ID.
   1825 C0 87 021E           1510         B     UNPACK                UNPACK DATA BYTE.
   1829 01             1829  1511         DC    IL1'1'
   182A 1804           1828  1512         DC    AL2(XPDTR)
   182C 1B5A           182D  1513         DC    AL2(MDATA-1)
                             1514
   182E C0 87 021A           1515         B     PRINT               PRINT TEST HEADING.
   1832 41             1832  1516         DC    XL1'41'
   1833 24             1833  1517         DC    IL1'36'
   1834 184E           1835  1518         DC    AL2(MD01)
   1836 40A0           1837  1519 MDNGID DC    XL2'40A0'
   1838 C0 87 021A           1520         B     PRINT               PRINT DATA TRANSFER HEADING.
   183C 05             183C  1521         DC    XL1'05'
   183D 0D             183D  1522         DC    IL1'13'
   183E 1B5B           183F  1523         DC    AL2(MDATA)
                             1524
   1840 C0 87 145C           1525         B     INITL               INITIALIZE THE 3741
                             1526
   1844 0C 00 186C 1802      1527         MVC   SIOCC2+2(1),CCSIO2  BUILD UP THE SIO CONTROL 2 COMMAND
   184A 0C 00 186F 1802      1528         MVC   SIOCC2+5(1),CCSIO2   TO CORRESPOND WITH CURRENT ROUTINE.
   1850 C0 87 1511           1529         B     QUES                TEST FOR SSW 10.
   1854 F0 3C 3C             1530         MPL   X'3C',X'3C'         HALT -FF- IF ON.
```

4032 3741 ATTACHMENT DATA TRANSFER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          1531
                          1532         LIO   H0002,X'41'          SET FNCT REG TO 6USEC RESET.
                          1533         LIO   H00F0,X'42'          LOAD -F0- IN LENGTH COUNT REG.
                          1534         LIO   ADRS,X'44'           LOAD BYTE TRANSFER ADDRESS IN DAR.
                          1535         LIO   H0080,X'41'          SET 3741 TO DIAGNOSTIC MODE.
                          1536
                          1537         SIO   X'00',X'41'          ISSUE A SIO READ CALL.
                          1538 SIOCC2  SIO   X'00',X'44'          DO 2 SIO CONTROL 2 'S TO TRANSFER A
                          1539         SIO   X'00',X'44'           DATA BYTE.
                          1540         SNS   SSA,X'45'             DUMMY SENSE TO STALL
                          1541         SNS   SSB,X'42'            SENSE STATUS/LENGTH COUNT REGISTER
                          1542         SIO   X'04',X'43'           I/O SELECT 3 WHICH FORCES EOT
                          1543
                          1544         SNS   SSA,X'45'            DUMMY SENSE
                          1545         SNS   SSA,X'45'            SENSE DIAGNOSTIC/DATA TRANS REG.
                          1546         SNS   SSC,X'44'            SENSE DATA ADDRESS REGISTER.
                          1547
                          1548         CLC   SSB(2),XPLCR         STATUS/LENGTH COUNT AS EXPECTED ?
                          1549         JNE   DATER                JUMP IF NOT.
                          1550         CLC   SSA(2),XPDTR         DIAGNOSTIC/DATA TRANS AS EXPECTED ?
                          1551         JNE   DATER                JUMP IF NOT.
                          1552         CLC   XPDTR(1),DADATA      DATA BYTE TRANSFER OK ?
                          1553         JNE   BADBYT               JUMP IF NOT.
                          1554         CLI   RTN#,X'01'           FROM ROUTINE 01 ?
                          1555         JNE   DATTA                JUMP IF NOT.
                          1556
                          1557         CLC   SSC(2),SSC-2         DATA ADDRESS REG AS EXPECTED ?
                          1558         JNE   DARN                 JUMP IF NOT.
                          1559         J     DATTA
                          1560
                          1561 * DATA SUBROUTINE ERROR MESSAGES *
                          1562
                          1563 BADBYT  MVC   ERID(1),RTHLT
                          1564         B     PRINT                PRINT DATA BYTE CHECK.
                    188F  1565         DC    XL1'C2'
                    18C0  1566         DC    IL1'20'
                    18C2  1567         DC    AL2(SNCK)
                    18C4  1568 ERID    DC    XL2'4000'
                          1569         B     PRINT                PRINT BYTE CHECK.
                    18C9  1570         DC    XL1'82'
                    18CA  1571         DC    IL1'20'
                    18CC  1572         DC    AL2(BYTCK)
                          1573
                          1574         B     UNPACK               UNPACK EXPECTED DATA BYTE.
                    18D1  1575         DC    IL1'1'
                    18D3  1576         DC    AL2(XPDTR)
                    18D5  1577         DC    AL2(XPAC-12)
                          1578         B     UNPACK               UNPACK ACTUAL DATA BYTE.
                    18DA  1579         DC    IL1'1'
                    18DC  1580         DC    AL2(DADATA)
                    18DE  1581         DC    AL2(XPAC-1)
                          1582         B     PRINT                PRINT EXPECTED AND ACTUAL DATA BYTE.
                    18E3  1583         DC    XL1'82'
                    18E4  1584         DC    IL1'23'
                    18E6  1585         DC    AL2(XPAC)
                          1586         MVC   ERRID(1),ERID        SAVE THE ERROR ID.
                          1587         MVI   MPER-1,X'94'         BUILD MAP REFERENCE.
                          1588         MVI   MPER,X'23'           -PAGE 942, ENTRY 3.
                          1589         B     OOFH
                          1590
                          1591 DARN    MVC   ERRID(1),RTHLT-1     STORE ERROR ID.
                          1592         MVC   IDER(1),RTHLT-1
                          1593         MVC   MSS-1(2),C05
                          1594         B     PRINT                PRINT ERROR HEADING.
                    190F  1595         DC    XL1'C2'
                    1910  1596         DC    IL1'20'
                    1912  1597         DC    AL2(SNCK)
                    1914  1598 IDER    DC    XL2'4000'
```


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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          1599         B     PRINT                PRINT DAR CHECK.
                    1919  1600         DC    XL1'82'
                    191A  1601         DC    IL1'14'
                    191C  1602         DC    AL2(MSS)
                          1603         J     OOFH
                          1604
                          1605 DATER   MVC   ERRID(1),RTHLT-1      STORE ERROR ID.
                          1606         MVC   ERRID(1),ERRRID      STORE THE ID.
                          1607         B     PRINT                PRINT SENSE ERROR HEADING.
                    1930  1608         DC    XL1'C2'
                    1931  1609         DC    IL1'20'
                    1933  1610         DC    AL2(SNCK)
                    1935  1611 ERRRID  DC    XL2'4000'
                          1612         CLI   RTN#,X'01'           FROM ROUTINE 01 ?
                          1613         JNE   OOFH                 JUMP IF NOT.
                          1614
                          1615         MVC   TEST-4(2),SSA        STORE DIAGNOSTIC/DATA TRANS REG.
                          1616         MVC   TEST-2(2),SSB        STORE STATUS/LENGTH COUNT REG.
                          1617         MVC   TEST(2),SSC          STORE DATA ADDRESS REGISTER.
                          1618
                          1619         B     CKPAT                COMPARE ACTUAL WITH EXPECTED PATTERN
                          1620
                          1621 OOFH    MVC   SSA-2(2),XPDTR       BRING IN EXPECTED SENSE BYTES.
                          1622         MVC   SSB-2(2),XPLCR
                          1623
                          1624         B     ERROR                DUMP THESE REGISTERS-
                    1963  1625         DC    XL1'05'              DIAGNOSTIC/DATA TRANSFER REG.
                    1965  1626         DC    XL2'0000'            -EXPECTED.
                    1967  1627 SSA     DC    XL2'0000'            -ACTUAL.
                    1968  1628         DC    XL1'02'              STATUS/LENGTH COUNT REG.
                    196A  1629         DC    XL2'0000'            -EXPECTED.
                    196C  1630 SSB     DC    XL2'0000'            -ACTUAL.
                    196D  1631         DC    XL1'FF'
                          1632         CLI   RTN#,X'01'           FROM ROUTINE 1 ?
                          1633         JNE   DMPY1                JUMP IF NOT.
                          1634         B     ERROR
                    1979  1635         DC    XL1'04'              DATA ADDRESS REGISTER.
                    197B  1636         DC    AL2(DADATA+1)        -EXPECTED.
                    197D  1637 SSC     DC    XL2'0000'            -ACTUAL.
                    197E  1638         DC    XL1'FF'
                          1639 DMPY1   B     MAPS                 POINT TO MAP CHART.
                    1984  1640 MPER    DC    XL2'0000'            -PAGE XXX, ENTRY X.
                          1641         B     HALT                 ERROR HALT.
                    198A  1642 ERRID   DC    XL2'4000'
                          1643 DATTA   B     LINK                 RETURN TO DCP.
                          1644
                          1645 ************
                          1646 * RESERVED *
                          1647 ********************************************************************************
                    1994  1648 TEST    DC    XL6'000000000000'    ACTUAL SENSE PATTERN STORAGE.
                    1995  1649 FLAG    DC    XL1'00'              ERROR FLAG.
                    1997  1650         DC    XL2'0000'
                    1998  1651 DADATA  DC    XL1'00'              BYTE THAT DATA IS TRANSFERED INTO.
                    199A  1652         DC    XL2'0000'
                          1653
                          1654 **********
                          1655 * TABLES *
                          1656 ********************************************************************************
                          1657
                          1658 *       TABLE OF EXPECTED ERROR PATTERNS FOR RTN01.
                          1659
                    199A  1660 PATRN   EQU   *-1
                          1661 *                D   S
                          1662 *                I D T L
                          1663 *                A T A C
                          1664 *                  G R T R
                    199E  1665         DC    XL4'080081F0'        SERVICE REQUEST CHECK.
                    19A0  1666         DC    AL2(DADATA)
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    19A1 01              19A1 1667        DC    XL1'01'          - MESSAGE ID.
    19A2 081081F1        19A5 1668        DC    XL4'081081F1'    SINGLE CHARACTER TRANS CHECK.
    19A6 1999            19A7 1669        DC    AL2(DADATA+1)
    19A8 02              19A8 1670        DC    XL1'02'          - MESSAGE ID.
    19A9 0811C9F1        19AC 1671        DC    XL4'0811C9F1'    I/O INPUT 7 CHECK.
    19AD 1999            19AE 1672        DC    AL2(DADATA+1)
    19AF 13              19AF 1673        DC    XL1'13'          - MESSAGE ID.
    19B0 0812C9F1        19B3 1674        DC    XL4'0812C9F1'    I/O INPUT 6 CHECK.
    19B4 1999            19B5 1675        DC    AL2(DADATA+1)
    19B6 14              19B6 1676        DC    XL1'14'          - MESSAGE ID.
    19B7 0814C9F1        19BA 1677        DC    XL4'0814C9F1'    I/O INPUT 5 CHECK.
    19BB 1999            19BC 1678        DC    AL2(DADATA+1)
    19BD 15              19B0 1679        DC    XL1'15'          - MESSAGE ID.
    19BE 0818C9F1        19C1 1680        DC    XL4'0818C9F1'    I/O INPUT 4 CHECK.
    19C2 1999            19C3 1681        DC    AL2(DADATA+1)
    19C4 16              19C4 1682        DC    XL1'16'          - MESSAGE ID.
    19C5 0820C9F1        19C8 1683        DC    XL4'0820C9F1'    I/O INPUT 3 CHECK.
    19C9 1999            19CA 1684        DC    AL2(DADATA+1)
    19CB 17              19CB 1685        DC    XL1'17'          - MESSAGE ID.
    19CC 0830C9F1        19CF 1686        DC    XL4'0830C9F1'    I/O INPUT 2 CHECK.
    19D0 1999            19D1 1687        DC    AL2(DADATA+1)
    19D2 18              19D2 1688        DC    XL1'18'          - MESSAGE ID.
    19D3 0850C9F1        19D6 1689        DC    XL4'0850C9F1'    I/O INPUT 1 CHECK.
    19D7 1999            19D8 1690        DC    AL2(DADATA+1)
    19D9 19              19D9 1691        DC    XL1'19'          - MESSAGE ID.
    19DA 0890C9F1        19DD 1692        DC    XL4'0890C9F1'    I/O INPUT 0 CHECK.
    19DE 1999            19DF 1693        DC    AL2(DADATA+1)
    19E0 20              19E0 1694        DC    XL1'20'          - MESSAGE ID.
    19E1 0815C1F1        19E4 1695        DC    XL4'0815C1F1'    I/O UNIT 1 CHECK.
    19E5 1999            19E6 1696        DC    AL2(DADATA+1)
    19E7 09              19E7 1697        DC    XL1'09'          - MESSAGE ID.
    19E8 081AC1F1        19EB 1698        DC    XL4'081AC1F1'    I/O UNIT 2 CHECK.
    19EC 1999            19ED 1699        DC    AL2(DADATA+1)
    19EE 10              19EE 1700        DC    XL1'10'          - MESSAGE ID.
    19EF 08BCC1F1        19F2 1701        DC    XL4'08BCC1F1'    I/O SELECT 10.
    19F3 1999            19F4 1702        DC    AL2(DADATA+1)
    19F5 11              19F5 1703        DC    XL1'11'          - MESSAGE ID.
    19F6 0810C1F0        19F9 1704        DC    XL4'0810C1F0'    LCR INCREMENT CHECK.
    19FA 1999            19FB 1705        DC    AL2(DADATA+1)
    19FC 07              19FC 1706        DC    XL1'07'          - MESSAGE ID.
    19FD 0810C1F1        1A00 1707        DC    XL4'0810C1F1'    DAR CHECK.
    1A01 1996            1A02 1708        DC    AL2(DADATA)
    1A03 05              1A03 1709        DC    XL1'05'          - MESSAGE ID.
    1A04 0810C9F1        1A07 1710        DC    XL4'0810C9F1'    I/O INPUT P CHECK.
    1A08 1999            1A09 1711        DC    AL2(DADATA+1)
    1A0A 12              1A0A 1712        DC    XL1'12'          - MESSAGE ID.
    1A0B 081081F0        1A0E 1713        DC    XL4'0810810F0'   CYCLE REQUEST CHECK.
    1A0F 1996            1A10 1714        DC    AL2(DADATA)
    1A11 03              1A11 1715        DC    XL1'03'          - MESSAGE ID.
    1A12 0810C1F1        1A15 1716        DC    XL4'0810C1F1'    DAR CHECK.
    1A16 1997            1A17 1717        DC    AL2(DADATA-1)
    1A18 05              1A18 1718        DC    XL1'05'          - MESSAGE ID.
    1A19 2310C1F1        1A1C 1719        DC    XL4'2310C1F1'    READ INTERLOCK CHECK.
    1A1D 1999            1A1E 1720        DC    AL2(DADATA+1)
    1A1F 04              1A1F 1721        DC    XL1'04'          - MESSAGE ID.
    1A20 0800E1F0        1A23 1722        DC    XL4'0800E1F0'    I/O SELECT REGISTER CHECK.
    1A24 1998            1A25 1723        DC    AL2(DADATA)
    1A26 06              1A26 1724        DC    XL1'06'          - MESSAGE ID.
    1A27 0300E1F0        1A2A 1725        DC    XL4'0300E1F0'    ATTACHMENT DRIVER CHECK.
    1A2B 1998            1A2C 1726        DC    AL2(DADATA)
    1A2D 08              1A2D 1727        DC    XL1'08'          - MESSAGE ID.
    1A2E FF              1A2E 1728        DC    XL1'FF'          * END OF TABLE *
                         1729
                         1730 ************
                         1731 * CONSTANTS *
                         1732 ************************************************************************
    1A2F 0000            1A30 1733 N0000  DC    HL2'0'
    1A31 0001            1A32 1734 N0001  DC    HL2'1'
```


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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    1A33 0002            1A34 1735 N002   DC    IL2'2'
    1A35 0003            1A36 1736 N003   DC    IL2'3'
    1A37 0006            1A38 1737 N006   DC    IL2'6'
    1A39 0007            1A3A 1738 N007   DC    IL2'7'
    1A3B 0008            1A3C 1739 N008   DC    IL2'8'
    1A3D FFF8            1A3E 1740 NFFF8  DC    XL2'FFF8'
    1A3F 0080            1A40 1741 H0080  DC    XL2'0080'
    1A41 2355            1A42 1742 H2355  DC    XL2'2355'
    1A43 4190            1A44 1743 H4190  DC    XL2'4190'
    1A45 AA55            1A46 1744 HAA55  DC    XL2'AA55'
    1A47 0082            1A48 1745 H0082  DC    XL2'0082'
    1A49 00AA            1A4A 1746 H00AA  DC    XL2'00AA'
    1A4B 55AA            1A4C 1747 H55AA  DC    XL2'55AA'
    1A4D 0107            1A4E 1748 H0107  DC    XL2'0107'
    1A4F 00FF            1A50 1749 H00FF  DC    XL2'00FF'
    1A51 00F0            1A52 1750 H00F0  DC    XL2'00F0'
    1A53 0482            1A54 1751 H0482  DC    XL2'0482'
    1A55 4080            1A56 1752 H4080  DC    XL2'4080'
    1A57 8082            1A58 1753 H8082  DC    XL2'8082'
    1A59 0280            1A5A 1754 H0280  DC    XL2'0280'
    1A5B 00FB            1A5C 1755 H00FB  DC    XL2'00FB'
    1A5D 00FE            1A5E 1756 H00FE  DC    XL2'00FE'
    1A5F 4840            1A60 1757 H4B40  DC    XL2'4840'
    1A61 1998            1A62 1758 ADRS   DC    AL2(DADATA)
    1A63 1A42            1A64 1759 ADRS55 DC    AL2(H2355)
    1A65 1A30            1A66 1760 ADRS00 DC    AL2(H0000)
    1A67 1383            1A68 1761 INTR5  DC    AL2(INT5)
    1A69 C087            1A6A 1762        DC    XL2'C087'
    1A6B 17E3            1A6C 1763 BRNCH  DC    AL2(BRCK)
    1A6D F2F1            1A6E 1764 C21    DC    CL2'21'
    1A6F F0F5            1A70 1765 C05    DC    CL2'05'
                         1766
                         1767 ************
                         1768 * MESSAGES *
                         1769 ************************************************************************
    1A71 D3C5C1E5C540C4C9 1A8E 1770 UPSIDC DC    CL30'LEAVE DIAGNOSTIC CONNECTOR ON.'
    1A79 C1C7D5D6E2E3C9C3        1770
    1A81 40C3D6D5D5C5C3E3        1770
    1A89 D6D940D6D548            1770
    1A8F C4D640E2E8E2E3C5 1AA5 1771 INTRQ  DC    CL23'DO SYSTEM RESET, START.'
    1A97 D440D9C5E2C5E368        1771
    1A9F 40E2E3C1D9E340          1771
    1AA6 5C5C5CC5D9D9D6D9 1AB3 1772 ERS    DC    CL11'***ERROR***'
    1AAE 5C5C5C                  1772
    1AB1 C6E4D5C3E3C9D6D5 1AC1 1772 MCD1 * DC    CL17'FUNCTION REGISTER'
    1AB9 40D9C5C7C9E2E3C5        1773
   *1AC1 D9                      1773
    1AC2 E2E3C1E3E4E240C2 1ACC 1774 MCD2A  DC    CL11'STATUS BYTE'
    1ACA E8E3C5                  1774
    1ACD D3C5D5C7E3C840C3 1ADC 1775 MCD2B  DC    CL16'LENGTH COUNT REG'
    1AD5 D6E4C5E340D9C5C7        1775
    1ADD C961D640E3D9C1D5 1AEE 1776 MCD3   DC    CL18'I/O TRANSFER LINES'
    1AE5 E2C6C5D940D3C9D5        1776
    1AED C5E2                    1776
    1AEF C4C1E3C140C1C4C4 1B03 1777 MCD4   DC    CL21'DATA ADDRESS REGISTER'
    1AF7 D9C5E2E240D9C5C7        1777
    1AFF C9E2E3C5D9              1777
    1B04 40C3C8C5C3D248  1B0A 1778 DARCK   DC    CL7' CHECK.'
    1B0B C4C9C1C7D5D6E2E3 1B19 1779 MCD5A  DC    CL15'DIAGNOSTIC BYTE'
    1B13 C9C340C2E8E3C5          1779
    1E1A C4C1E3C140E3D9C1 1B2A 1780 MCD5B  DC    CL17'DATA TRANSFER REG'
    1B22 D5E2C6C5D940D9C5        1780
    1B2A C7                      1780
    1B2B E2C9D5C7D3C540C3 1B4E 1781 MD01   DC    CL36'SINGLE CHARACTER READ TRANSFER TEST.'
    1B33 C8C1D9C1C3E3C5D9        1781
    1B3B 40D9C5C1C440E3D9        1781
    1B43 C1D5E2C6C5D94BE3        1781
    1B4B C5E2E34B                1781
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
    1B4F C4C1E3C140C2E8E3 1B5B 1782 HDATA  DC    CL13'DATA BYTE XX.'
    1B57 C540E7E74B       1B5B 1782
    1B5C F040F140F240F340 1B6A 1783 BITS   DC    CL15'0 1 2 3 4 5 6 7'
    1B64 F440F540F640F7   1B6A 1783
    1B6B 60C5C2F240C2E8E3 1B74 1784 EB2    DC    CL10'-EB2 BYTE-'
    1B73 C560             1B74 1784
    1B75 60C5C2F140C2E8E3 1B7E 1785 EB1    DC    CL10'-EB1 BYTE-'
    1B7D C560             1B7E 1785
    1B7F C2E8E3C540E3D9C1 1B92 1786 BYTCK  DC    CL20'BYTE TRANSFER CHECK.'
    1B87 D5E2C6C5D940C3C8 1B92 1786
    1B8F C5C3D24B         1B92 1786
    1B93 C4C1E3C140E3D9C1 1BA6 1787 SNCK   DC    CL20'DATA TRANSFER CHECK.'
    1B9B D5E2C6C5D940C3C8 1BA6 1787
    1BA3 C5C3D24B         1BA6 1787
    1BA7 C5E7D7C5C3E3C5C4 1BBD 1788 XPAC   DC    CL23'EXPECTED XX  ACTUAL XX.'
    1BAF 40E7E74040C1C3E3 1BBD 1788
    1BB7 E4C1D340E7E74B   1BBD 1788
    1BBE C4D640C5D5C440D6 1BEC 1789 HD0B   DC    CL47'DO END OF TRANSFER -EOT- BY READ CALL OVERFLOW.'
    1BC6 C640E3D9C1D5E2C6 1BEC 1789
    1BCE C5D94060C5D6E360 1BEC 1789
    1BD6 40C2E840D9C5C1C4 1BEC 1789
    1BDE 40C3C1D3D340D6E5 1BEC 1789
    1BE6 C5D9C6D3D6E648   1BEC 1789
    1BED F3F7F4F140C9E240 1BFE 1790 NORDY  DC    CL18'3741 IS NOT READY.'
    1BF5 D5D6E340D9C5C1C4 1BFE 1790
    1BFD E84B             1BFE 1790
    1BFF F3F7F4F140C9E240 1C0B 1791 BISY   DC    CL13'3741 IS BUSY.'
    1C07 C2E4E2E84B       1C0B 1791
    1C0C C7D640E3D640F3F7 1C2D 1792 MAPSS  DC    CL34'GO TO 3741 MAPS, PAGE 000 ENTRY 0.'
    1C14 F4F140D4C1D7E26B 1C2D 1792
    1C1C 40D7C1C7C540F0F0 1C2D 1792
    1C24 F040C5D5E3D9E840 1C2D 1792
    1C2C F04B             1C2D 1792
    1C2E C4D640F340C4C1E3 1C46 1793 HD0A   DC    CL25'DO 3 DATA READ TRANSFERS.'
    1C36 C140D9C5C1C44DE3 1C46 1793
    1C3E C9C1D5E2C6C5D9E2 1C46 1793
    1C46 4B               1C46 1793
    1C47 E3C5E2E340E2C5D9 1C63 1794 HD09   DC    CL29'TEST SERVICE RESPONSE DRIVER.'
    1C4F E5C9C3C540D9C5E2 1C63 1794
    1C57 D7D6D5E2C540C4D9 1C63 1794
    1C5F C9E5C5D94B       1C63 1794
    1C64 E3C5E2E340E2C5E3 1C8C 1795 HD08   DC    CL41'TEST SET/RESET OF SERVICE RESPONSE LATCH.'
    1C6C 61D9C5E2C5E34DD6 1C8C 1795
    1C74 C640E2C5D9E5C9C3 1C8C 1795
    1C7C C540D9C5E2D7D6D5 1C8C 1795
    1C84 E2C540D3C1E3C3C8 1C8C 1795
    1C8C 4B               1C8C 1795
    1C8D E2C9D5C7D3C54DC3 1CB1 1796 HD07   DC    CL37'SINGLE CHARACTER WRITE TRANSFER TEST.'
    1C95 C8C1D9C1C3E3C5D9 1CB1 1796
    1C9D 40E6D9C9E3C540E3 1CB1 1796
    1CA5 D9C1D5E2C6C5D940 1CB1 1796
    1CAD E3C5E2E34B       1CB1 1796
    1CB2 E3C5E2E340C6D6D9 1CC6 1797 HD06   DC    CL21'TEST FOR BUSY ON/OFF.'
    1CBA 40C2E4E2E840D6D5 1CC6 1797
    1CC2 61D6C6C64B       1CC6 1797
    1CC7 C4D640C5D5C440D6 1CF6 1798 HD0C   DC    CL48'DO END OF TRANSFER -EOT- BY WRITE CALL OVERFLOW.'
    1CCF C640E3D9C1D5E2C6 1CF6 1798
    1CD7 C5D94060C5D6E360 1CF6 1798
    1CDF 40C2E840E6D9C9E3 1CF6 1798
    1CE7 C54CC3C1D3D340D6 1CF6 1798
    1CEF E5C5D9C6D3D6E64B 1CF6 1798
    1CF7 C4C5C3D9C5D4C5D5 1D16 1799 HD0D   DC    CL32'DECREMENT DATA ADDRESS REGISTER.'
    1CFF E340C4C1E3C140C1 1D16 1799
    1D07 C4C4D9C5E2E240D9 1D16 1799
    1D0F C5C7C9E2E3C5D94B 1D16 1799
    1D17 E3C5E2E340F3F7F4 1D32 1800 HD0E   DC    CL28'TEST 3741 INTERRUPT ABILITY.'
    1D1F F140C9D5E3C5D9D9 1D32 1800
    1D27 E4D7E340C1C2C9D3 1D32 1800
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
    1D2F C9E3E84B         1D33 1800
    1D33 E3C5E2E340C2C1C4 1D53 1801 HD0F   DC    CL33'TEST BAD PARITY IN DATA TRANSFER.'
    1D3B 40D7C1D9C9E3E840 1D53 1801
    1D43 C9D540C4C1E3C140 1D53 1801
    1D4B E3D9C1D5E2C6C5D9 1D53 1801
    1D53 4B               1D53 1801
    1D54 E3C5E2E340F3F7F4 1D76 1802 HD10   DC    CL35'TEST 3741 AND I/O ATTENTION LIGHTS.'
    1D5C F140C1D5C440C961 1D76 1802
    1D64 D640C1E3E3C5D5E3 1D76 1802
    1D6C C9D6D540D3C9C7C8 1D76 1802
    1D74 E3E24B           1D76 1802
    1D77 D9C5E2C5E340C8C1 1DAA 1803 READ   DC    CL52'RESET HALT. EXPECT 3741 AND I/O ATTENTION LIGHTS ON.'
    1D7F D3E36840C5E7D7C5 1DAA 1803
    1D87 C3E340F3F7F4F140 1DAA 1803
    1D8F C1D5C440C961D640 1DAA 1803
    1D97 C1E3E3C5D5E3C9D6 1DAA 1803
    1D9F D540D3C9C7C8E3E2 1DAA 1803
    1DA7 40D6D54B         1DAA 1803
    1DAB C9C640C2D6E3C840 1DC0 1804 IFY    DC    CL22'IF BOTH LIGHTS NOT ON.'
    1DB3 D3C9C7C8E3E24DD5 1DC0 1804
    1DBB D6E340D6D56B     1DC0 1804
    1DC1 F4F0F0F1         1DC4 1805 ENTRY  DC    CL4'4001'
    1DC5 E6D9C9E3C540C3C1 1DDF 1806 WRTCK  DC    CL27'WRITE CALL TERMINATE CHECK.'
    1DCD D3D340E3C5D9D4C9 1DDF 1806
    1DD5 D5C1E3C540C3C8C5 1DDF 1806
    1DDD C3D24B           1DDF 1806
    1DE0 F3F7F4F140C9E240 1DF0 1807 NOTSO  DC    CL17'3741 IS NOT BUSY.'
    1DE8 D5D6E340C2E4E2E8 1DF0 1807
    1DF0 4B               1DF0 1807
    1DF1 E2C5D9E5C9C3C540 1E07 1808 SRVCK  DC    CL23'SERVICE RESPONSE CHECK.'
    1DF9 D9C5E2D7D6D5E2C5 1E07 1808
    1E01 40C3C8C5C3D24B   1E07 1808
    1E08 E2C5D9E5C9C3C540 1E28 1809 SRVR   DC    CL33'SERVICE RESPONSE LATCH NOT RESET.'
    1E10 D9C5E2D7D6D5E2C5 1E28 1809
    1E18 40D3C1E3C3C840D5 1E28 1809
    1E20 D6E340D9C5E2C5E3 1E28 1809
    1E28 4B               1E28 1809
    1E29 E2C5D9E5C9C3C540 1E46 1810 DRIVCK DC    CL30'SERVICE RESPONSE DRIVER CHECK.'
    1E31 D9C5E2D7D6D5E2C5 1E46 1810
    1E39 40C4D9C9E5C5D940 1E46 1810
    1E41 C3C8C5C3D24B     1E46 1810
    1E47 C961D640E3D9C1D5 1E5E 1811 TRLCK  DC    CL24'I/O TRANSFER LINE CHECK.'
    1E4F E2C6C5D940D3C9D5 1E5E 1811
    1E57 C540C3C8C5C3D24B 1E5E 181'
    1E5F C5D6E340C3C8C5C3 1E68 1812 CKEOT  DC    CL10'EOT CHECK.'
    1E67 D24B             1E68 1812
    1E69 C9D5E3C5D9E4D7E3 1E7F 1813 NOINT  DC    CL23'INTERUPT DID NOT OCCUR.'
    1E71 40C4C9C440D5D6E3 1E7F 1813
    1E79 40D6C3C3E4D94B   1E7F 1813
    1E80 F3F7F4F140C9E240 1E8D 1814 RDYON  DC    CL14'3741 IS READY.'
    1E88 D9C5C1C4E84B     1E8D 1814
    1E8E C961D640C1E3E3C5 1EA1 1815 ATTN   DC    CL20'I/O ATTENTION CHECK.'
    1E96 D5E3C9D6D540C3C6 1EA1 1815
    1E9E C5C3D24B         1EA1 1815
    1EA2 E2C5D5E2C540C3C8 1EAD 1816 SNSCK  DC    CL12'SENSE CHECK.'
    1EAA C5C3D24B         1EAD 1816
    1EAE D6E5C5D9C6D3D6E6 1EBC 1817 OVRFL  DC    CL15'OVERFLOW CHECK.'
    1EB6 40C3C8C5C3D24B   1EBC 1817
    1EBD C4C1E3C140C3C8C5 1ECA 1818 MSS    DC    CL14'DATA CHECK 00.'
    1EC5 C3D240F0F04B     1ECA 1818
    1ECB D5D6D540E2C9D4E4 1EDE 1819 NOFND  DC    CL20'NON SIMULATED CHECK.'
    1ED3 D3C1E3C5C440C3C8 1EDE 1819
    1EDB C5C3D24B         1EDE 1819
    1EDF C9C1D940F540D9C5 1EF3 1820 ERIAR  DC    CL21'IAR 5 REGISTER CHECK.'
    1EE7 C7C9E2E3C5D940C3 1EF3 1820
    1EEF C8C5C3D24B       1EF3 1820
    1EF4 C1D9D940F540D9C5 1F08 1821 ERARR  DC    CL21'ARR 5 REGISTER CHECK.'
    1EFC C7C9E2E3C5D940C3 1F08 1821
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1F04 C8C5C3D24B           1821
   1F09 C9C1D9F561C1D9D9 1F1C 1822 ORRQ   DC    CL20'IAR5/ARR -OR- CHECK.'
   1F11 4060D6D96040C3C8     1822
   1F19 C5C3D24B             1822
   1F1D                 1F77 1823 PRT    DS    CL91                PRINT FIELD.
   1F78 40              1F78 1824        DC    XL1'40'             CLEARING BYTE.
                             1825
                             1826 ***********
                             1827 * EQUATES *
                             1828 ***********************************************************************
                        0008 1829 ARR    EQU   X'08'
                        0216 1830 LINK   EQU   X'216'
                        022A 1831 LOAD   EQU   X'22A'
                        021A 1832 PRINT  EQU   X'21A'
                        021E 1833 UNPACK EQU   X'21E'
                        0001 1834 XR1    EQU   X'01'
                        0002 1835 XR2    EQU   X'02'
                        0222 1836 HALT   EQU   X'222'
                        0A03 1837 RTN#   EQU   X'0A03'
                        0084 1838 IAR5   EQU   X'84'
                        0200 1839 CPU    EQU   X'200'
                        1A30 1840 H0000  EQU   N000
                        1994 1841 TEMP   EQU   TEST
                        1EEC 1842 NCD88  EQU   ERIAR-7
                        1EFF 1843 NCD08  EQU   ERARR-9
                        1A34 1844 H0002  EQU   N002
                        0080 1845 SSW10  EQU   X'80'
                        020A 1846 SBYTE2 EQU   X'020A'
                        0A07 1847 FRTN   EQU   X'0A07'
                        0200 1848 SRT    EQU   X'0200'
                        0A11 1849        END   BEGINN
```


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CROSS-REFERENCE

```
SYMBOL   T LEN VALUE  DEFN  REFERENCES
ACT      A 002 1579   1267  1281  1285  1290  1294  1417* 1422  1424
ADIT     A 004 135F   0998  0899  1013  1466  1483
ADJST    A 003 12E0   0958  0952
ADRS     A 002 1A62   1758  0192  0228  0463  0608  0701  0796  0946  1051  1534
ADRS00   A 002 1A66   1760  0317  0406
ADRS55   A 002 1A64   1759
ALTER    A 004 0A43   0062  0058
ARR      C 001 0008   1829  0575  1132  1183  1186  1200  1218  1238  1269  1323* 1324  1327* 1328
                            1373  1442  1505* 1506
ATTN     A 020 1EA1   1815
BADBYT   A 006 1885   1563  1553
BEGIN    A 001 0A0D   0039  0015
BEGINN   A 004 0A11   0043  0067  1849
BISY     A 013 1C0B   1791  1159
BITS     A 015 186A   1783  1409  1410
BITSNF   A 004 161C   1323  1421
BRNCH    A 002 1A6C   1763  0941
BTNF     A 004 1678   1349  1328*
BUSY     A 004 1491   1156  0198
BYTCK    A 020 1892   1786  1572
CCSIO2   A 001 18D2   1499  1527  1528
CKCK     A 004 1782   1447  1442*
CKEOT    A 010 1E68   1812  0659  0753
CKIAR    A 004 17A0   1442  0912  0914  0916  0974  0976  0978
CKIT     A 004 16A1   1375  1432
CKOUT    A 004 1794   1433  1378
CKPAT    A 004 1538   1238  1619
CKS      A 005 1543   1241  1254
CMPARE   A 004 157A   1269  1427
CMPR     A 004 15D2   1298  1269*
CONV     A 003 13E8   1068
CPU      C 001 0200   1839  0898
C05      A 002 1A70   1765  1593
C21      A 002 1A6E   1764  1256
DADATA   A 001 1998   1651  0229* 0526  0546  0566  0838  0855  1552  1580  1636  1666  1669  1672
                            1675  1678  1681  1684  1687  1690  1693  1696  1699  1702  1705  1708
                            1711  1714  1717  1720  1723  1726  1758
DARCK    A 007 1B0A   1778  0833
DARN     A 006 18F9   1591  1558
DATA     A 004 1808   1505  0080  0100  0120  0139  0159
DATA1    A 006 1813   1507  1506*
DATER    A 006 1920   1605  1549  1551
DATTA    A 004 1988   1643  1555  1559
DMPY1    A 004 197F   1639  1633
DRIVCK   A 030 1E46   1810  0424
EB1      A 010 187E   1785  1407
EB1T     A 001 1618   1321  1326* 1341
EB2      A 010 1874   1784  1406
EB2T     A 001 161A   1320  1334
ENTRY    A 004 1DC4   1805
EPRNT1   A 004 14C5   1183  1408  1423
EPRNT2   A 004 14D0   1186  1404  1411  1428
ERARR    A 021 1F08   1821  0970  1843
ERIAR    A 021 1EF3   1820  0938  1842
ERID     A 002 18C4   1568  1563* 1586
ERMS     A 004 1555   1246  1257
ERRID    A 002 198A   1642  1586* 1591* 1606*
ERROR    A 004 1699   1373  0260  0277  0353  0370  0427  0518  0538  0558  0645  0662  0735  0756
                            0836  0853  0873  1094  1112  1456  1624  1634
ERRID    A 002 1935   1611  1605* 1606
ERR16    A 004 0DCE   0555  0505  0507  0509
ERRR19   A 004 1060   0867  0822  0824
ERR07    A 004 086E   0271  0246  0248
ERR16    A 004 0DA2   0535  0491  0493  0495
ERR17    A 004 0E9F   0656  0631  0633
ERR18    A 004 0F66   0749  0720  0722
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ERR19	A	004	1037	0847	0813 0815
ERS	A	011	1AB0	1772	1426
ER0F1	A	004	1412	1088	1062
ER0F2	A	004	1437	1106	1066
ER07A	A	004	0B4A	0254	0239
ER1A	A	004	1364	1003	0968 0993
ER14	A	004	0C2B	0364	0337
ER14A	A	006	0BEF	0343	0335
ER16	A	004	0D76	0515	0477 0479 0481
ER17	A	004	0E7B	0639	0620
ER18	A	004	0F39	0728	0711 0713
ER19	A	004	1013	0830	0804
E16	A	004	0DFA	0575	0516 0536 0556
FLAG	A	001	1995	1649	0943* 0967 0982* 0992 1019*
FRTN	C	001	0A07	1847	0055*
HAA55	A	002	1A46	1744	0911 0973
HALT	C	001	0222	1836	0064 0267 0287 0360 0377 0434 0531 0551 0571 0652 0672 0745
					0766 0843 0863 0883 1011 1083 1101 1119 1152 1163 1174 1464
					1481 1641
HDATA	A	013	185B	1782	1513 1523
HDNGID	A	002	1837	1519	1509*
HD0A	A	025	1C46	1793	0454
HD0B	A	047	1BEC	1789	0599
HD0C	A	048	1CF6	1798	0690
HD0D	A	032	1D16	1799	0785
HD0E	A	028	1D32	1800	0903
HD0F	A	033	1D53	1801	1041
HD01	A	036	184E	1781	1518
HD06	A	021	1CC6	1797	0182
HD07	A	037	1CB1	1796	0218
HD08	A	041	1C8C	1795	0307
HD09	A	029	1C63	1794	0396
HD10	A	035	1D76	1802	
HFFF8	A	002	1A3E	1740	1227
HPLXX	A	002	0A4C	0065	0057 0060* 0062*
H00AA	A	002	1A4A	1746	
H00FB	A	002	1A5C	1755	0465
H00FE	A	002	1A5E	1756	0610
H00FF	A	002	1A50	1749	0227 0700 0947
H00F0	A	002	1A52	1750	0405 0794 1050 1533
H0000	A	002	1A30	1840	0190 0191 0193 0316 0318 0407 0464 0609 0622 0699 0795 1134
					1135 1760
H0002	A	002	1A34	1844	0226 0404 0462 0607 1049 1532
H0080	A	002	1A40	1741	0408 0466 0611 0702 1052 1133 1535
H0082	A	002	1A48	1745	0315 0698 0948
H0107	A	002	1A4E	1748	0915 0977
H0280	A	002	1A5A	1754	
H0482	A	002	1A54	1751	0793
H2355	A	002	1A42	1742	1759
H4B40	A	002	1A60	1757	
H4080	A	002	1A56	1752	
H4190	A	002	1A44	1743	0319
H55AA	A	002	1A4C	1747	0913 0975
H8082	A	002	1A58	1753	0230
IAR	A	002	17CC	1459	0910* 0911* 0913* 0915* 0972* 0973* 0975* 0977* 1443 1444* 1446 1446
IAR5	C	001	0084	1838	0944* 0983* 1443* 1444
IDER	A	002	1914	1598	1592*
IFY	A	022	1DC0	1804	
INITL	A	004	145C	1132	0185 0221 0310 0399 0457 0602 0693 0788 0906 0980 1044 1525
INTL	A	004	1473	1138	1132*
INTR0	A	023	1AA5	1771	0051
INTR5	A	002	1A68	1761	0935 0936 0944 0983
INT5	A	004	1383	1019	1023 1761
ISBSY	A	004	0ADA	0198	0196
ITON	A	004	166C	1345	1342
ITSON	A	004	1656	1338	1335

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
JUMP	A	004	12F0	0964	0939
LINE	A	001	140C	1189	1184* 1187*
LINK	C	001	0216	1830	0200 0250 0269 0289 0339 0362 0379 0417 0436 0511 0533 0553
					0573 0635 0654 0674 0724 0747 0768 0826 0845 0865 0385 1154
					1165 1176 1643
LOAD	C	001	022A	1831	0998 1071 1085 1103 1121
L3742	A	001	0000	0005	
MAPS	A	004	14EA	1200	0265 0285 0358 0375 0432 0529 0549 0569 0650 0670 0743 0764
					0841 0861 0881 1009 1081 1099 1117 1150 1161 1172 1462 1479
					1639
MAPSS	A	034	1C2D	1792	1202* 1203* 1204* 1205* 1209
MPER	A	002	1984	1640	1508* 1587* 1588*
MPIAR	A	002	17D8	1463	0909* 0971*
MPREF	A	002	1808	1502	1508
MSS	A	014	1ECA	1818	1244* 1245* 1249 1256* 1563* 1602
NCD08	A	021	1EFF	1843	1400
NCD1	A	017	1AC1	1773	1383
NCD2A	A	011	1ACC	1774	1386
NCD2B	A	016	1ADC	1775	1387
NCD3	A	018	1AEE	1776	1390
NCD4	A	021	1B03	1777	1393
NCD5A	A	015	1B19	1779	1396
NCD5B	A	017	182A	1780	1397
NCD88	A	021	1EEC	1842	1403
NCOD	A	001	1698	1372	1376* 1377 1381 1384 1388 1391 1394 1398 1401
NF	A	004	165A	1339	1331* 1336* 1337 1338* 1352*
NFF	A	004	1670	1346	1332* 1343* 1344 1345* 1353*
NORND	A	020	1EDE	1819	
NOINT	A	023	1E7F	1813	1006
NORDY	A	018	1BFE	1790	1079 1148
NOTSO	A	017	1DF0	1807	1170
NTBSY	A	004	14AB	1167	0197
NTRDY	A	004	1477	1145	1137
NTRST	A	004	13F7	1076	1069
N000	A	002	1A30	1733	1840
N001	A	002	1A32	1734	1323 1327 1431 1433
N002	A	002	1A34	1735	1305 1306 1352 1353 1412 1415 1844
N003	A	002	1A36	1736	1221
N006	A	002	1A38	1737	
N007	A	002	1A3A	1738	1252
N008	A	002	1A3C	1739	1505
OOFH	A	006	1953	1621	1589 1603 1613
ORCK	A	004	17E3	1473	1763
ORIT	A	004	10E1	0939	0937* 0938* 0996
ORRO	A	020	1F1C	1822	1476
OVRFL	A	015	1E8C	1817	0870
PATCK	A	004	155D	1250	1238*
PATRN	A	001	199A	1660	1239
PRINT	C	001	021A	1832	0043 0048 0179 0215 0254 0271 0304 0346 0364 0393 0421 0451
					0576 0596 0639 0656 0687 0729 0750 0782 0830 0847 0867 0900
					1003 1038 1076 1088 1106 1145 1156 1167 1188 1206 1246 1450
					1473 1515 1520 1564 1569 1582 1594 1599 1637
PRNT	A	004	14D8	1188	1185
PRT	A	091	1F77	1823	0052* 0053 0053* 0343* 0344 0345* 0349 0351 0351* 1191 1192 1192*
					1380 1380* 1383* 1386* 1387* 1390* 1393* 1396* 1397* 1400* 1403* 1406*
					1407* 1405* 1410* 1419 1420 1426*
PRTT	A	004	14E6	1193	1183* 1186*
QS	A	004	1522	1222	1218* 1221* 1225 1226 1228
QST	A	004	1526	1224	1220
QUES	A	004	1511	1218	0187 0223 0312 0401 0459 0604 0695 0790 0950 1046 1529
RDYON	A	014	1E8D	1814	
READ	A	052	1DAA	1803	
RTMLT	A	002	18DA	1503	1507* 1563 1591 1592 1605
RTN#	C	001	0AD3	1837	1509 1554 1612 1632
RTNOA	A	001	0CB8	0447	0391
RTN0B	A	001	0EDC	0592	0449

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CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RTNCC	A	001	0EC8	0683	0594
RTNCD	A	001	0F93	0778	0685
RTNCE	A	001	1089	0894	0780
RTNCF	A	001	1398	1034	0896
RTNC1	A	001	0A51	0076	0041 0054
RTNC2	A	001	0A62	0096	0078
RTNC3	A	001	0A73	0116	0098
RTNC4	A	001	0A84	0135	0118
RTNC5	A	001	0A95	0155	0137
RTNC6	A	001	0AA6	0175	0157
RTNC7	A	001	0AE2	0211	0177
RTNC8	A	001	0B97	0300	0213
RTNC9	A	001	0C4F	0389	0302
RTRN	A	004	0ED8	0581	0515* 0535* 0555* 0575*
SBYTE2	C	001	020A	1846	1219
SET1	A	004	10D9	0937	0935*
SET2	A	004	10DD	0938	0936*
SIOCC2	A	003	186A	1538	1527* 1528*
SKPER	A	004	1784	1428	1425
SNCK	A	020	18A6	1787	0579 1567 1597 1610
SNSCK	A	012	1EAD	1816	0642 0732 0850 1091
SRT	C	001	0200	1848	
SRVCK	A	023	1E07	1808	0257
SRVR	A	033	1E28	1809	0343 0367
SSA	A	002	1967	1627	1540* 1544* 1545* 1550 1615 1621*
SSB	A	002	196C	1630	1541* 1548 1616 1622*
SSC	A	002	197D	1637	1546* 1557 1557 1617
SSW10	C	001	0080	1645	1219
SS0FA	A	002	1424	1097	1058* 1059* 1061 1061
SS0FB	A	002	1449	1115	1064* 1065 1065
SS07A	A	002	0B5C	0263	0235* 0236* 0238 0238
SS07B	A	002	0B80	0280	0242* 0247 0247
SS07C	A	002	0B85	0283	0243* 0245 0245
SS14A	A	002	0C19	0356	0327* 0328* 0334 0334
SS14B	A	002	0C3D	0373	0332* 0336 0336
SS15A	A	002	0CA9	0430	0413* 0414* 0416 0416
SS16A	A	002	0D86	0521	0472* 0476 0476
SS16B	A	002	0D88	0524	0473* 0478 0478
SS16C	A	002	0D90	0527	0474* 0480 0480
SS16E	A	002	0DB2	0541	0486* 0490 0490
SS16F	A	002	0DB7	0544	0487* 0492 0492
SS16H	A	002	0DBC	0547	0488* 0494 0494
SS16I	A	002	0DDE	0561	0500* 0504 0504
SS16J	A	002	0DE3	0564	0501* 0506 0506
SS16K	A	002	0DE8	0567	0502* 0508 0508
SS17B	A	002	0E8D	0648	0617* 0619 0619
SS17C	A	002	0EB1	0665	0625* 0627* 0630 0630
SS17D	A	002	0EB6	0668	0628* 0632 0632
SS18A	A	002	0F4F	0738	0708* 0710 0710 0728*
SS18B	A	002	0F54	0741	0707* 0712 0712
SS18D	A	002	0F7C	0759	0716* 0719 0719 0749*
SS18E	A	002	0F81	0762	0717* 0721 0721
SS19A	A	002	1025	0839	0802* 0803 0803
SS19B	A	002	1049	0856	0809* 0812 0812
SS19C	A	002	104E	0859	0810* 0814 0814
SS19D	A	002	1072	0876	0818* 0821 0821
SS19E	A	002	1077	0879	0819* 0823 0823
TAERR	A	004	160A	1309	1270* 1282 1286 1305*
TA1	A	004	15AF	1285	1274* 1280 1299 1299*
TA2	A	004	15A5	1281	1273* 1300 1300*
TA3	A	004	159E	1279	1272* 1301 1301* 1307
TBERR	A	004	1612	1311	1271* 1291 1295 1306*
TB1	A	004	15C7	1294	1277* 1289 1297 1302 1302*
TB2	A	004	158D	1290	1276* 1303 1303*
TB3	A	004	15B6	1288	1275* 1283 1304 1304* 1310
TC	A	004	15CE	1297	1292 1312

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CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
TEMP	A	006	1994	1841	0940* 0997 1008 1461 1478
TEMP1	A	002	1997	1024	1021*
TEST	A	006	1994	1648	0344* 0345 1200* 1201 1241 1615* 1616* 1617* 1841
THEADR	A	002	17C1	1453	1448*
TNF	A	004	1648	1334	1329* 1348 1350 1350* 1354
TNFF	A	004	165E	1341	1330* 1351 1351*
TRLCK	A	024	1E5E	1811	1109
TRY	A	004	1561	1252	1242
UNPACK	C	001	021E	1833	1510 1574 1578
UPSIOC	A	030	1A8E	1770	0046
WRTCK	A	027	1DDF	1806	0274
XPAC	A	023	1B8D	1788	1577 1581 1585
XPDTR	A	002	1804	1500	1512 1550 1552 1576 1621
XPLCR	A	002	1806	1501	1548 1622
XPT	A	002	1577	1266	1279 1288 1414* 1424
XR1	C	001	0001	1834	0054* 0055 0908* 0939* 0940 0941 0970* 0996* 0997 1008 1201* 1202 1203 1204 1205 1211 1226* 1227 1239* 1241 1244 1245 1252* 1253 1271 1332 1374* 1375 1412* 1413 1415* 1416 1420* 1430* 1431* 1433* 1434 1448 1461 1478
XR2	C	001	0002	1835	1270 1331 1419*
XYR1	A	006	1759	1417	1430

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

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OBJECT CARD LISTING

THE CHARACTER ° INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
°GBK°GBD°°°PN°55	58780°EC°825057°	3741°ATT°DATA°TR	ANSFER°TEST°°°°°	84@@84@@°°°°°°°°	°°°°°°°°40320000
T+-Y:ECH°°E°°B-7	M"4AE°°D°BVG°/OH	ĒE/BĒTUC-OH*BF-Q	PFD̄M&EA°8CEY¬)1°	80-D̄HML&AB-*°8°Z	<@YD°PA#40320001
T+-Z5A33-BU32/0E	28EZ<OH*BHUC/OH*	H̄D&D°Bw.°/1-.1°-	E0¬FL*MAA~°H̄*@B	GF°?6BDCA@RJA&U<	C°°Y°N1H40320002
T+-D̄O/<BGF°?Y8H̄C	A@RJ/JDM@°°D̄NOH*	0E=DHA*GIVHEFJOM	°BD̄$°/1-.8--H̄O¬F	N°M/IA-°H̄8%BG°/Z	EEJ0°P1#40320003
T+-..1UB¥OH*MP<B	GEJG0|CO1&JYO<MH	Ē<CEDF¥H1JJYO@4<	°0HH̄H5%BGEH̄?A&/K	J0H*BE-*°@-.°/OH	ĒJKM°9YQ40320004
T+-%¥G.F°Z@BGEE3	°/1MJ@CO@<MDĒ(CE	BFV°1JAZS|H̄YR¥CE	AFVT?-.-°JDC3JD°	0J&_*|°°.P°4AE50	.O7H°*.°40320005
T+-_/°KG3JH°0E->	°<DM./&4AB@M.-"H	A<E-/D-°.-?HAH̄<B	G°/$°/OHĒO/*:A4A	H̄0H*OM&MV°°°°"@B	GE+Y°7HU40320006
T+->*VMG°/OHSED-	°/CHU0H*BF%H$G)°	°L<BGEZUB80°°°°M	°D-°°"@BGE+D̄N&%E	G°SI°L<BG°/OH°°1	|OH*°QH@40320007
T+-?P°/ZEH̄J2<&H̄x	°/1J*0H*ND¬°@|CE	AFU-16/YO<M&ĒRTE	EFT°16JZD@4H°@4J	°@4J°<D<<FLACCAU	0J&0°50%40320008
T+-0K|&4ACAU<E"H	AC&4ACC4<+"HA&<B	G°/Q<HA@°GS-<AJW	MG3@<AJ@°FRL°/OH	Ē0V%¬)4A+CEY¬)1°	80H*°7YD40320009
T+-1(EZUC"0Q°°|"	°/1LD̄VOG°/OHS&D#	°/OHCOH*BF%H/GS/	°L&BGEZUEC&°°°|"	°/1LD̄VO.°/OHS&D"	°/OH°9-640320010
T+-2HE-U°C.?°/OH	ĒJJ4*Q4BZOH*MP<B	GEJGD|CO1&JY4<MH	ĒMTEDFWQ1JJYO<MD	Ē&|(B°|(D&|(D&CA	CCH̄:Ē9U40320011
T+-3C<D<<D̄&4ACH̄U	<Z@BA°/$°/OHĒO/8	;JUA&OH*DW&|"A°°	°"@BGE+D̄NQ@BG°SI	°K<BG°/QH̄°°8<OH*	BFUM°#--40320012
T+-3=FJ1F&H̄.°/1J	*0H*ND¬°@|CEAFT&	1JAZS<MMĒ<CEBFVO	1&JZ°@4D°@4J/@4J	/<DM(/TABCQ%0J°6	&C&D°;I440320013
T+-49CQ9(/!HA*°4	ACQ%(S¬HARO4ACR°	(T?HAP?(DQ?(DQTA	EC$HO&-67<D&(?°4	AC$H(%|HA$04AC$*	(_¬H°NH̄°40320014
T+-54°SO(°66@Cs.	2°N73JFT3JF-0J&7	;<DH(83ADC;-(°&/	;C)32°08(°&7TC;G	2°OH(°&7YC;$2°N3	°/OH°R/%40320015
T+-67ET1JC-¬°/07	:OH*OW&MTA&°°°YG	@°°°DFRU°°|"°/1L	D̄VCG°/CHS&EG°/OH	Q|EH+A@BGC¬.°/1Ē	RAK<°51Y40320016
T+-7D̄B-°°°YG*°°°	DFRY°°|"°/1LD̄VQG	°/OHS&E.°/OHO|E<	+A&BGC¬.°/1ĒRAK+	-°°°B-¬8°°°&R@0°	°"@°°12840320017
T+-8V/1LD̄VQG°/OH	S&E|°/OHO(°-+B@B	G°/.BEA>W&°C°/0°	°BO°+2<BG°/ZE.1?	X&H̄?°/1J*OH*ND¬°	@|CD"°3840320018
T+-9-&JY4<M&ĒQTE	EFT°16/Z:<MDĒ&|(	A°|(D)|(D)CABCY4	(°&:(CY?2°KO1JJY	O@/J/@4J/<DM+%LA	EC.D°M3&40320019
T+-:$<DH+_-4AC.D	+."HA<&4AC.O+_|H	AH<BG°/$°/OHĒO-0	;.MANOH*OW&HA"D°	°"@BGE+D̄N-%BG°SI	°N*°°QT°40320020

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CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-#O/0H0OH*BF%H	H̄G#/°N%BGEZUE@°M	°°°.T°°°°"@BGE+D̄	N-@BG°SI°N%BG°/Q	<°°=LOH*BFUMOG|R	°,<°°:&U40320021
T+-@J/1J*0H*ND¬°	@|CEAFU-1JJYO<MH	ĒMCEDF¥H1&JZ°@4M	°@4J°@4J°<DH|NCA	EC4@(°°°++C432°KY	(°&E°=Z840320022
T+-°<N°°K@-D/@4J	°<DM|¬CABC8D(°°°	@C7X2°LY(°&=AC7"	2°LG°/OHO|°°|L@B	G°/.ECA:_&E¬°/1Ē	RAKH°53840320023
T+-=G°°°°°Y<°°°C	"0H*M:ZOD0H*BHUA	PQH*BETO°C73°/0H	Ē0-Y:ĒDAQ0H*O¥&M	H°°°°°><°°°C"0H*	M:ZM°ĒY040320024
T+-"B/*BG°SI°0<B	G°/Q(°ABIOH*BFUM	-GJR°.*BGEE3°/1M	J@CO@<MDĒNCEBFVH	1JJY0<M&ĒQ?(A°|(	DO|<°MD%40320025
T+-"°JF°0JA°VC&D	&IJ°T@-EA@4J-@4J	-<D&&KLABDD8(°JA	IDD¬2°M8(°JA+DD3	2°MP3&0&0&/A2<DM	&)04°=AH40320026
T+/°8°JA2DGC2°NY	(°JA7DGP2°NG°/0H	00H*BF%H*FOZ°0*B	GEZUDFR*°|"°/1L	D̄V-G°/OHS&EX°/0H	00H*°0O@40320027
T+/A3°/.BCA:_&E.	°/1ĒRAAWD°°°B-¬H	°°|"°/1LD̄V-.°/0H	S&E.°/OHDOH*BF%H	|G.1°P<BGEZUB@¬H	°°°H°PY&40320028
T+/B>°°°°°|"°/1L	D̄V-|°/OHS&E3°/0H	OC-°L¥C7E°-C°°J(	¬0H*BFUM*GLI°.%B	GEE3B°J#3|B<P6C2	HE@-°OHU40320029
T+/C2C°DP2/ZFQH*	PY°0AE8YĒL<BGE:°	<°J¬HFU#°/1:-C°°	&6/ZXC°°&7/ZY+-°	&83Y°D+LB°J.0G<	RV°<LBH40320030
TH1D(L°<CF¥O#-A¥	N(O&ĒĒCEDFWH1&/Z	&<HDĒK<BGEJGO|C3	°/1.¬°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°1AU40320031
T+/<Ē@4°B@4D°@4L	D@4LDQH*K@<BGD?L	°/1.8OH*K"CS°FRP	2UFGB°J@H|B&P6C0	HE@-<°J¬HFU$°/1;	-C°D°1Z°40320032
T+/(NE@YĒL<BGE:°	<°J¬HFU#°/1:-OH*	NPC>°FRM5/AZY@4°	K0H*L&<BGD4L°/1(	HOH*LLCS°FRP2UAG	3&°4°JZ%40320033
T+/+&(&D&9DOC°1W	HOH*BH̄-C°/0HĒO/.	:¬4A:L°<CFRL°/1L	D̄VS.°/OHS&E#°/1(	¬+Y°RV*BGD8%OJJ+	P@4°°MQ&40320034
T+/|.C*BGD8<°°°@	°"""°/0HĒJKD)M4B	?0H*MP<BGEJGO|CO	1&JY4<NHĒMTEDF¥H	1&JZ°@4D°@4LH84L	HKDH°4$%40320035
T+/&FFB&O&/&U@4<	DC&DM:IA&S@-D4<D<	MK&4AEDUMJ"HAL|&	°C*E°D"¬°/0HD̄<B	G°/.BD/?=&FC°/1L	D̄VU&°8#%40320036
T+/JAOH*BHUA-0H*	BH̄-C°/0HĒ0-0:.MA	/0H*DW&.I&E°°"@B	GE+D̄O&*BG°SI°Q*B	G°SV°OH*BF%HQGV9	°Q%°°&KD40320037
T+/J@/1ĒR°"SS°°C	"0H*M:ZR80H*BHUA	S0H*BH̄-°4BAJ6<MD	Ē&CEBFT°1JJYO@4°	(DM°M!@8G°°C°/0H	ĒO/H°53<40320038
T+/K7F"9°|%BGE+D	&**BG°SI°|%BG°/$	°/0HĒ0-4*B4°"0H*	M:ZMSOH*BHU"0H*	BE%BG°/.8DJ7C&F$	°/1&°13D40320039
T+/L2:ZM/0H*BHUA	W0H*BET&ME+U@-JL	*@Y*H(°-M:L2BE(3	°/0HĒ°E%¬)O1Ē67*	¬:<BG°°°4BAWM(&D	RVA-°5QY40320040
T+/M_°/0S°A-CGB<	°F°H*I°DQ°10%°*B	G°/ŌFH/0_4H*B(°-	NILS°°-.2D°V+°JN	VFT$°/0°°|*HB°<°	AEKH°@A°40320041
T+/NY(&DNIMCA°/Y	=0H*NHT&HEOCB°JW	ĒL&MFFRL2°JQQ°/#	HA1-CG%UG0H*BFYH	+G%.°/0°°(-DE+X7	"*°°JL%40320042

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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/OT JNCC D;2JZ	>0H*NN& 4BAP	N(HOCL&AE/M8 J0	¬| DNZT:AE$ 8 J0	7| DN?T0AE*-8 JN	68/ 2C&40320043
T+/P;BT-AEPT2DE#	2/0*8 JN80ZAN+ D	N)"H&BT-AEPX2DD#	2/0*8 JN90ZAD+H	N2< & + A0OE$ + AM 7#840320044	
T+/QRZ/OWC- NX1O	¬C- N2APHC- N?/O	=C- N_1D7C0DOCJY	4C0D0EJY40H*NXT1	* C /1O6|E0 <B	GE*8 5T 40320045
T+/RM 6BAY2(-	OR&0AES8 0AE/X	CQHFTH4BAR#| D	CKL0AEv84 /R)(D	0*3- E/.2D *88AR	S8Y* QY040320046
Y+/E|AC31EV%0	+ OF"H&A330ExG	2/0&88JR1| CS	EUX D C- 0KJR	IC- 0P1R-C0D0PJY	4C0D JA840320047
T+/SHEx<E(<BGEu-	(-OY<HA 4 JE	DC OW |¬0DW|H	A8-1EG7*¬:C4AEZT	2 &Q<DA*KF%D* /E	Q8-D EY840320048
T+/*EC 0RG4&E3 0	|G5xE7C4CEZT2 &Q	<DJ*LF>8*AAEQ8-D	FCA&¬NA%C|&MOW|H	AC 0+G4Q8F&06G5%	8HT4 4R040320049
T+/) BAEQ8-DFC %	¬WA#"|0-O#|HAA-0	(G5D;#<BGE(<BJ*	CF7&<BJ*PF7# /1L	EC 8¬J/_DC 8¬0/_	DDH# *-040320050
T+/)#E(6 JY4(D	PH 0AEP# CQAFTS	4 J);C DN;& 0-H	¬J%HAG5. /1Q*EPX	/1LEC&DN)1N98YD	HC Y "S%40320051
T+/;6G3<Ex<BGEP.	/1L&(&DPPTQAFT.	/1E/(-DE<T&AE9"	/0 (-P_LODE8Y	4/A¬<C&DP3A¬HCHD	C& R1440320052
T+/¬1 J¬A0H*BF%H	N A E<BGEZU	|*< 0<RV<BGE+D	0H*8G S1 E<BGD5"	/0HE0/&¬GDAZL <	CFR& SL 40320053
T+/-%0H*N:T-A0H#	8HUAZ0H*LP0	CQHFT048A-	0C -Q8- C DR/A-	H8 <Q(0YC0H*BG-D	QAA% 20H40320054
T+//X0%8G /ZAIA_	+&HC /0HEA&4%0J8	GEE0< A/%F H< A/	?F . /1MJ@C0@<MD	E(CEBFVH1JAZS<MD	E&|< 40*40320055
T+/SS&&C3J C3J	0JJVX<DHR#|(CACA	EF0*0JJVX<D&R¬64	AFC0QA?HAU 4AF0*	QA|HA/04 F &R%|H	AD34 KD040320056
T+/T) &YC8-GSC&D	R¬JV#8-EG8Y¬0C	Q1A-H0H*BF%HMF:R	<8G /D8EA>K0H*	8G-DQAA>10H*8G-D	RW%X RD840320057
T+/UQ?<8G /D8E1>	C RS/TD|1&R-30	TFQL /1VLC RS/-	IC REA-IC D;2JZ	00H*BF%HMF:R <B	G /Y 1004O320058
T+/VL--8;2?HG<00	FLNQB&0 FQYR(*B	G /.EEA>W& * &Y	C8-DDC DRUAVXC D	RU/V%C DRVAV*0H*	N+00 22-40320059
T+/W+ JVWF &< JV	DF S /1ERA& B |8* &YC8-D	H0H*D8&&RW& *88	GE+Y <BG SI <B	G /Q) Y40320060	
T+/XI B 8A8%WQ &-	&¬DRW&HHD*X1FRU	LBA.I8JWRE -M2¬D	RWJHHF<X1FRU0B C	I8JU 2,<40320061	
T+/YDWJ*H<<X1FRU	QBEC I8JWRF&S62¬D	R%K HE*G1FRU1BA.	A8JWRD SOG¬DRWJD	HD<G0FRUGBACA8JW	QA&- 08H40320062
T+/Y"D<X1FRUK8AB	A8W%Q 0-&0¬DRV0H	TD<G1FRUD8 C/8A%	QA-< 8¬ R% T"	& B < A- G T	"= $Q<40320063
T+/Z:-8(N&RBDN&8	B HZND-DG |8 8 K	B&HB --H |% "U_	FR-E&/Y0D8| /1¬	T8?G0*)|E0:PE&<L	10** ¬YY40320064

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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/D55)$S8@XC&<|	O5)PE0=|O6MC05M?	D5UCS:+.T1)J 6*P	S1:(.&+.T0)XTK51	*P<PR6)$RPE1*1>L	N0=< JHM40320065
T+/.02)$N&(XE1@X	S8@PR8>|A8=LS&<.	Y8@PL1)PG8@/ 0*$	U5:(6*PG2OGO&+|	R0)PS1%PR&(|I5*P	S1<D Q& 40320066
T+/%.8@E 0*LD6*P	S8UCR1*¬I8>|E6MC	C2<PC4U?D2*GG5)$	S8@XC&<.Y8@PD0:|	A&+|R0)PS1%PR&(X	E1=H :S840320067
T+/_W2)PG4@N 08T	A6*GC8@PR&(XE0*J	8*XAE:.F1)V 8@P	S847D0:|A&<.Y8@N	9=).@DC1&|I @4C	46|M &HX40320068
T+/>/6|R *6CE0?I	0>TT1OA-1*.1&<.	Y8@N-0>TT1MCT6*G	N8%$E&MCC2<PC4U?	D0:|A&+|R0)PS1%P	R&<< @0840320069
T+/?*2<PC4U?E9*¬	E0=|E1DCX94A 0*|	T9<GL&+¬XK@LO&<P	N1DCO1UCT6*GN8%$	E6MA-1)$TQDCB:DC	R1*D R/840320070
T+/0P1DCC0)|L&(8	V1)XF4*$WK*|7*|E	2:I 5)$T&(XE0*L	YK*|7*|E 2:I 0>L	S:D?G5UCT5UC3**L	1&(& :S 40320071
T+/1K0)¬S&4CP0*¬	E&|C0@DCE5:|R:DC	0K@LO&|(1<GTOMC	R1*GD&+|R0)PS1%P	R@U?T1:.T&+.E6:P	I0@M 0 %40320072
T+/2(&(XE8_¬05:.	E&<LR2:PE6M?T1:.	T&+.E86GR1:.E84C	O1LCS1)XV2*|E&(X	E8_¬Q5:.E&(|A8@|	HK=H)#040320073
T+/3H2)PG4@N 08T	A6*GC8@PR&+$R2:|	E&+|R0)PS1%PR&+|	E8>(.8@PS84CFS_V	0>LS:DCO5OGO1%R	.1(Q 0J440320074
T+/4C&<PN1DCO1UC	T6*GN8%$E6MA-1)$	TQDCB:DCW&<XT1MC	C0)|L&($V1)XF4*$	WK@LE0*XE5<PN84C	D0:< =0Y40320075
T+/4=0MCA1<LR1:.	S&(XE1&XS8@PRK=|	E&>(8"¬46MCI5:|	E6)XU5=(0*.I4@X	T:D?T1:.1&<.A1DC	P0)U ¬0040320076
T+/592:|Y&<XN&<L	A8@E 8*XA5:.F1)V	.&@PS84C3*"L1&<G	N1DCI0)R 0:|T1)P	T2)$N&(|I1@TT8U?	R1:H =TH40320077
T+/641:(2<GL86_	1:¬P1*|T&|7*|E	0)PD&<V/5UCA8=|	E5:|I5_N 4@XG2+|	S&($NK@XF&<.O8@/	48U "SH40320078
T+/7?1@TT8UCN5>(	5_N.*|C0&:$R2:|	E&<|A4*(&8PR5<X	N0:|E&<|H1*|KK"|	7*|E 2:I 5)$T&<.	U8>-)ID40320079
T+/8DK=.E6:P10@N	6*PS5*$N8%N 08T	EC*I.8%PR9*XC1MC	R1:.PS_PS1MCL0:|	C2DCN5>(6*PS1:(	.8%M =8840320080
T+/9V6:P10@N 6*P	S5*$N8%N 1(XI9*P	R&<|H1*|KK@V/5UC	T6*GN8%$E6MCL2)P	E&<|H1*|KK@P084C	C2<M 3.D40320081
T+/:-0*I.2)PT1)X	U5=(1<XD&(P084C	00@|U6M73*"L1&<X	S&(XE0*LYK@V/5UC	A8=|E5:|I5_N 08T	E0*H 3C 40320082
T+/@$K=.E5:.E&<|	H1*|KK*$V1)XF4*$	W&<|H1*|KK&LA88E	0@TEC*I @|A.5)$	N&+.I5+LL0:|E1DC	C2<M $$ 40320083
T+/8D0*I.2*GR&|N	6*PG2:.T1)V 08T	EC*I.0)XR&|N 6*P	G2:.T1)V 0@TE0*I	.2*GR*GGA6)V C(S	RQD @:-40320084
TAJ@*0@TE0*I.					#Z 40320085
T A*8&					5KU40320086

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OBJECT CARD LISTING

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

EB/E*E7*=¬DC"PH$ ="7M&F| | C Fx ASC R A S0 Q 07090520750 613757#%40320087

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT                                  LAST CHG :08 01 74
                           2 *
                           3         DECK  4
                           4         SEQ   0
   0000                    5 X404    START 0
                           6         TREP
   0A00                    7         ORG   X'0A00'
                           8 ********************************************************************************
                           9 *                                                                              *
                          10 *                              SECTION PREFACE                                 *
                          11 *                                                                              *
                          12 ********************************************************************************
   0A00 4042          0A01 13         DC    XL2'4042'       PROGRAM ID AND REVISION LEVEL
   0A02 00            0A02 14         DC    XL1'00'         SECTION FLAGS
   0A03 01            0A03 15         DC    XL1'01'         CURRENT ROUTINE NUMBER
   0A04 0000          0A05 16         DC    XL2'0000'       RESERVED
   0A06 0A0D          0A07 17         DC    AL2(RTN01)      ADDRESS OF FIRST ROUTINE
   0A08 FFFF          0A09 18         DC    XL2'FFFF'       ERROR RECORDING TABLE
   0A0A 405000        0A0C 19 UDT1    DC    XL3'405000'     3741
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                          21 ****************
                          22 *  ROUTINE 1   *                                                               *
                          23 ********************************************************************************
                          24 *                                                                              *
                          25 *            THIS ROUTINE WRITES A PAT'ERN FOR SEVERAL RECORDS.                *
                          26 *            IT THEN READS THEM BACK AND COMPARES FOR PROPER DATA.             *
                          27 *            IT ASSUMES THAT 401. 402. AND 403 RAN WITHOUT ERROR.              *
                          28 *                                                                              *
                          29 ********************************************************************************
                          30
   0A0D 01            0A0D 31 RTN01   DC    XL1'01'         ROUTINE 1
   0A0E 80            0A0E 32         DC    XL1'80'         MANUAL INTERVENTION REQUIRED
   0A0F 0C4A          0A10 33         DC    AL2(RTN02)      NEXT ROUTINE
                          34
                          35 *  INSTRUCT C.E. TO SET UP 3741.
                          36
                          37
   0A11 31 41 1C76         38         LIO   FUNBIT.LFUNC    FUNCTION REG TO X'4000'
                          39
                          39
                          39
   0A15 3C 87 0CD0         40         MVI   JRW+1,X'87'     SET UP FOR PGM TO SPECIFY READ OR WRT
   0A19 3C FF 1C50         41         MVI   EXPFLG,X'FF'    EXPECT AN INTERRUPT
   0A1D 3C 00 1C5A         42         MVI   INTFLG,X'00'    CLEAR INTERRUPT FLAG
   0A21 C0 87 021A         43 BEG     B     PRINT
   0A25 42            0A25 44         DC    XL1'42'
   0A26 27            0A26 45         DC    AL1(ASTRK1-ASTRKS)
   0A27 149D          0A28 46         DC    AL2(ASTRK1)
   0A29 40F1          0A2A 47         DC    XL2'40F1'
   0A2B C0 87 021A         48         B     PRINT
   0A2F 02            0A2F 49         DC    XL1'02'
   0A30 27            0A30 50         DC    AL1(HD1-HD1B)
   0A31 15FC          0A32 51         DC    AL2(HD1)
   0A33 C0 87 021A         52         B     PRINT
   0A37 02            0A37 53         DC    XL1'02'
   0A38 27            0A38 54         DC    AL1(ASTRK1-ASTRKS)
   0A39 149D          0A3A 55         DC    AL2(ASTRK1)
   0A3B C0 87 021A         56         B     PRINT
   0A3F 01            0A3F 57         DC    XL1'01'
   0A40 27            0A40 58         DC    AL1(IN1B-IN1A)
   0A41 1317          0A42 59         DC    AL2(IN1B)
   0A43 C0 87 021A         60         B     PRINT
   0A47 01            0A47 61         DC    XL1'01'
   0A48 27            0A48 62         DC    AL1(IN1C-IN1B)
   0A49 133E          0A4A 63         DC    AL2(IN1C)
   0A4B C0 87 021A         64         B     PRINT
   0A4F 01            0A4F 65         DC    XL1'01'
   0A50 27            0A50 66         DC    AL1(IN1D-IN1C)
   0A51 1365          0A52 67         DC    AL2(IN1D)
   0A53 C0 87 021A         68         B     PRINT
   0A57 01            0A57 69         DC    XL1'01'
   0A58 27            0A58 70         DC    AL1(IN1E-IN1D)
   0A59 138C          0A5A 71         DC    AL2(IN1E)
   0A5B C0 87 021A         72         B     PRINT
   0A5F 01            0A5F 73         DC    XL1'01'
   0A60 27            0A60 74         DC    AL1(IN1-IN1E)
   0A61 13B3          0A62 75         DC    AL2(IN1)
   0A63 C0 87 021A         76         B     PRINT
   0A67 12            0A67 77         DC    XL1'12'
   0A68 C0 87 021A         78         B     PRINT
   0A6C 01            0A6C 79         DC    XL1'01'
   0A6D 27            0A6D 80         DC    AL1(ASTRK1-ASTRKS)
   0A6E 149D          0A6F 81         DC    AL2(ASTRK1)
   0A70 C0 87 021A         82         B     PRINT
   0A74 02            0A74 83         DC    XL1'02'
   0A75 27            0A75 84         DC    AL1(ASTRK1-ASTRKS)
   0A76 149D          0A77 85         DC    AL2(ASTRK1)
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           86          B       PRINT
 0A78 C0 87 021A           87          DC      XL1'01'
 0A7C 01                   88          DC      AL1(IN2B-IN2A)
 0A7D 27                   89          DC      AL2(IN2B)
 0A7E 1401                 90          B       PRINT
 0A80 C0 87 021A           91          DC      XL1'01'
 0A84 01                   92          DC      AL1(IN2C-IN2B)
 0A85 27                   93          DC      AL2(IN2C)
 0A86 1428                 94          B       PRINT
 0A88 C0 87 021A           95          DC      XL1'01'
 0A8C 01                   96          DC      AL1(IN2D-IN2C)
 0A8D 27                   97          DC      AL2(IN2D)
 0A8E 144F                 98          B       PRINT
 0A90 C0 87 021A           99          DC      XL1'02'
 0A94 02                  100          DC      AL1(IN2-IN2D)
 0A95 27                  101          DC      AL2(IN2)
 0A96 1476                102          B       PRINT
 0A98 C0 87 021A          103          DC      XL1'01'
 0A9C 01                  104          DC      AL1(ASTRK1-ASTRKS)
 0A9D 27                  105          DC      AL2(ASTRK1)
 0A9E 149D                106          B       PRINT
 0AA0 C0 87 021A          107          DC      XL1'01'
 0AA4 01                  108          DC      AL1(ASTRK1-ASTRKS)
 0AA5 27                  109          DC      AL2(ASTRK1)
 0AA6 149D                110          B       PRINT
 0AA8 C0 87 021A          111          DC      XL1'02'
 0AAC 02                  112          DC      AL1(ASTRK1-ASTRKS)
 0AAD 27                  113          DC      AL2(ASTRK1)
 0AAE 149D                114          B       PRINT
 0AB0 C0 87 021A          115          DC      XL1'12'
 0AB4 12                  116          B       PRINT
 0AB5 C0 87 021A          117          DC      XL1'02'
 0AB9 02                  118          DC      AL1(ASTRK1-ASTRKS)
 0ABA 27                  119          DC      AL2(ASTRK1)
 0ABB 149D                120          B       PRINT
 0ABD C0 87 021A          121          DC      XL1'01'
 0AC1 01                  122          DC      AL1(IN3B-IN2XC)
 0AC2 27                  123          DC      AL2(IN3B)
 0AC3 1539                124          B       PRINT
 0AC5 C0 87 021A          125          DC      XL1'02'
 0AC9 02                  126          DC      AL1(IN3-IN3B)
 0ACA 27                  127          DC      AL2(IN3)
 0ACB 1560                128          B       PRINT
 0ACD C0 87 021A          129          DC      XL1'01'
 0AD1 01                  130          DC      AL1(IN4A-IN4B)
 0AD2 27                  131          DC      AL2(IN4A)
 0AD3 15AE                132          B       PRINT
 0AD5 C0 87 021A          133          DC      XL1'06'
 0AD9 06                  134          DC      AL1(IN4-IN4A)
 0ADA 27                  135          DC      AL2(IN4)
 0ADB 15D5                136          B       HALT
 0ADD C0 87 0222  0AE2    137 HTF1     DC      XL2'40F1'
 0AE1 40F1                138
                          139          LIO     ZERO,LDTR
 0AE3 31 45 1C4C          140          SNS     SNS3,SLINES
 0AE7 30 43 1C7C          141          CLC     SNS3(2),XF900
 0AEB 0D 01 1C7C 1C4E     142          JNE     WRPOFF
 0AF1 F2 01 11            143          B       PRINT
 0AF4 C0 87 021A  0AF8    144          DC      XL1'16'
 0AF8 16                  145          B       PRINT
 0AF9 C0 87 021A  0AFD    146          DC      XL1'02'
 0AFD 02                  147          DC      AL1(MSG22-MSG22B)
 0AFE 4F          0B00    148          DC      AL2(MSG22)
 0AFF 1ACE                149          B       BEG
 0B01 C0 87 0A21  0B05    150 WRPOFF   EQU     *
                          151
                          152 *   -------
                          153 *     SET UP FOR WRITE LOOP
```

WAIT FOR CE TO PREPARE 3741

LOAD DATA TRANSFER REG WITH 0000
SNS IO TRANSFER LINES
  IF F900, WRAP CONNECTOR STILL ON.
IF WRAP CONN IS OFF, JUMP (CONTINUE)
SPACE 6

TELL HIM WRAP IS STILL ATTACHED.


```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          154 *
                          155 *   -------
 0B05 3C 55 1C57          156          MVI   CHAR,X'55'          START WITH 55 FIELD
 0B09 3C 34 1C58          157          MVI   RECCTR,NUMREC       NUMBER OF RECORDS TO WRITE
 0B0D 3C 42 0D16          158          MVI   DCSIO+1,SWRITE      PREPARE TO WRITE
                          159
 0B11 0C 00 1275 1C57     160          MVC   BUFF2+127(1),CHAR   PROPOGATE 'CHAR' THROUGH BUFFER
 0B17 0C 7E 1274 1275     161          MVC   BUFF2+126(127),BUFF2+127
 0B1D 0C 02 1C6B 1C68     162          MVC   SEQ(3),NUMONE       INITIALIZE COUNTER (F0F0F1)
 0B23 0C 02 11FB 1C68     163          MVC   BUFF2+5(3),SEQ      PUT COUNT INTO BUFFER
                          164
                          164
                          165 *     WRITE LOOP
                          166
 0B29                     167 WLOOP    EQU   *
 0B29 0C 7F 11F5 1275     168          MVC   BUFF1+127(128),BUFF2+127   MOVE PATTERN BUFFER TO I/O BUFF
                          169          B     RW
 0B2F C0 87 0CA3          170          SLC   RECCTR(1),ONE       DECREMENT RECORD COUNTER
 0B33 0F 00 1C58 1C48     171          JZ    ENDW                EXIT LOOP WHEN ALL RECORDS WRITTEN
 0B39 F2 81 0C            172          B     CHGBUF              CHANGE PATTERN IN BUFFER
 0B3C C0 87 0EB2          173          B     WLOOP               BRANCH BACK FOR NEXT WRITE
 0B40 C0 87 0B29          174          B     *+4                 FILLER
 0B44 C0 87 0B48  0B48    175 ENDW     EQU   *
                          176          B     GETINT              WAIT FOR INTERRUPT (READ MODE)
 0B48 C0 87 0F8C          177          SIO   REQJ+RSR,SCTL1      RESPOND EOJ AND SENSE RESPONSE
 0B4C F3 43 50            178          SIO   SDISAB,SCNTRL       DISABLE INTERRUPTS
 0B4F F3 40 04            179          B     *+4
 0B52 C0 87 0B56
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         181 *   READ 52 RECORDS AND COMPARE VALUES AS WRITTEN
                         182 *
  0B56 3C FF 1C50        183         MVI   EXPFLG,X'FF'          EXPECT AND INT
  0B5A C0 87 021A        184         B     PRINT
  0B5E 42          0B5E  185         DC    XL1'42'
  0B5F 27          0B5F  186         DC    AL1(ASTRK1-ASTRKS)
  0B60 149D        0B61  187         DC    AL2(ASTRK1)
  0B62 40F2        0B63  188         DC    XL2'40F2'
  0B64 C0 87 021A        189         B     PRINT
  0B68 02          0B68  190         DC    XL1'02'
  0B69 28          0B69  191         DC    AL1(HD2-HD28)
  0B6A 1624        0B6B  192         DC    AL2(HD2)
  0B6C C0 87 021A        193         B     PRINT
  0B70 02          0B70  194         DC    XL1'02'
  0B71 27          0B71  195         DC    AL1(IN1X-IN1XB)
  0B72 13DA        0B73  196         DC    AL2(IN1X)
  0E74 C0 87 021A        197         B     PRINT
  0B78 01          0B78  198         DC    XL1'01'
  0B79 27          0B79  199         DC    AL1(ASTRK1-ASTRKS)
  0B7A 149D        0B7B  200         DC    AL2(ASTRK1)
  0B7C C0 87 021A        201         B     PRINT
  0B80 12          0B80  202         DC    XL1'12'
  0B81 C0 87 021A        203         B     PRINT
  0B85 01          0B85  204         DC    XL1'01'
  0B86 27          0B86  205         DC    AL1(IN2XA-IN2XB)
  0B87 14C4        0B88  206         DC    AL2(IN2XA)
  0B89 C0 87 021A        207         B     PRINT
  0B8D 01          0B8D  208         DC    XL1'01'
  0B8E 27          0B8E  209         DC    AL1(IN2X-IN2XA)
  0B8F 14EB        0B90  210         DC    AL2(IN2X)
  0B91 C0 87 021A        211         B     PRINT
  0B95 02          0B95  212         DC    XL1'02'
  0B96 27          0B96  213         DC    AL1(IN2XC-IN2X)
  0B97 1512        0B98  214         DC    AL2(IN2XC)
  0B99 C0 87 021A        215         B     PRINT
  0B9D 01          0B9D  216         DC    XL1'01'
  0B9E 27          0B9E  217         DC    AL1(ASTRK1-ASTRKS)
  0B9F 149D        0BA0  218         DC    AL2(ASTRK1)
  0BA1 C0 87 021A        219         B     PRINT
  0BA5 12          0BA5  220         DC    XL1'12'
  0BA6 C0 87 021A        221         B     PRINT
  0BAA 02          0BAA  222         DC    XL1'02'
  0BAB 27          0BAB  223         DC    AL1(ASTRK1-ASTRKS)
  0BAC 149D        0BAD  224         DC    AL2(ASTRK1)
  0BAE C0 87 021A        225         B     PRINT
  0BB2 01          0BB2  226         DC    XL1'01'
  0BB3 27          0BB3  227         DC    AL1(IN3B-IN2XC)
  0BB4 1539        0BB5  228         DC    AL2(IN3B)
  0BB6 C0 87 021A        229         B     PRINT
  0BBA 02          0BBA  230         DC    XL1'02'
  0BBB 27          0BBB  231         DC    AL1(IN3X-IN3)
  0BBC 1587        0BBD  232         DC    AL2(IN3X)
  0BBE C0 87 021A        233         B     PRINT
  0BC2 01          0BC2  234         DC    XL1'01'
  0BC3 27          0BC3  235         DC    AL1(IN4A-IN4B)
  0BC4 15AE        0BC5  236         DC    AL2(IN4A)
  0BC6 C0 87 021A        237         B     PRINT
  0BCA 06          0BCA  238         DC    XL1'06'
  0BCB 27          0BCB  239         DC    AL1(IN4-IN4A)
  0BCC 15D5        0BCD  240         DC    AL2(IN4)
  0BCE C0 87 0222        241         B     HALT
  0BD2 40F2        0BD3  242 HTF2    DC    XL2'40F2'
                         243
                         244 *   --------
                         245 *     SET UP FOR READ LOOP
                         246 *
                         247 *   --------
  0BD4 3C 34 1C58        248         MVI   RECCTR,NUMREC         NUMBER OF RECORDS TO BE READ
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  0BD8 3C 41 0D16        249         MVI   DOSIO+1,SREAD          READ
  0BDC 3C 55 1C57        250         MVI   CHAR,X'55'            START EXPECTING 55'S
  0BE0 0C 00 1275 1C57   251         MVC   BUFF2+127(1),CHAR
  0BE6 0C 7E 1274 1275   252         MVC   BUFF2+126(127),BUFF2+127  PROPAGATE CHAR
  0BEC 0C 02 1C6B 1C68   253         MVC   SEQ(3),NUMONE         INITIALIZE COUNTER (F0F0F1)
  0BF2 0C 02 11FB 1C6B   254         MVC   BUFF2+5(3),SEQ        PUT COUNTER INTO BUFFER
                         255
                         256 *     READ LOOP
                         257
  0BF8 C0 87 0CA3        258 RLOOP  B     RW                     READ RECORD
  0BFC 0D 7F 11F5 1275   259         CLC   BUFF1+127(128),BUFF2+127  COMPARE READ AND EXPECTED DATA
  0C02 C0 01 0F01        260         BNE   CMPER
  0C06 0F 00 1C5B 1C48   261         SLC   RECCTR,ONE
  0C0C C0 81 0C1C        262         BZ    ENDR                   QUIT WHEN RECORDS READ
  0C10 C0 87 0EB2        263         B     CHGBUF                 CHANGE PATTERN IN BUFFER
  0C14 C0 87 0BF8        264         B     RLOOP
  0C18 C0 87 0C1C        265         B     *+4
                   0C1C  266 ENDR   EQU   *
  0C1C C0 87 0F8C        267         B     GETINT                 WAIT FOR INTERRUPT (READ MODE)
  0C20 30 43 1C7C        268         SNS   SNS3,SLINES            SNS I/O TRANSFER LINES FOR EOJ
  0C24 38 08 1C7C        269         TBN   SNS3,EOJ               IS END OF JOB   LINE UP.
  0C28 F2 10 10          270         JT    EOJISU
  0C2B C0 87 021A        271         B     PRINT                  EOJ NOT UP AFTER ALL READ BACK
  0C2F C6          0C2F  272         DC    XL1'C6'
  0C30 4F          0C30  273         DC    AL1(MSG12-MSG12B)
  0C31 19BA        0C32  274         DC    AL2(MSG12)
  0C33 408A        0C34  275         DC    XL2'408A'
                         276
  0C35 C0 87 0222        277         B     HALT
  0C39 408A        0C3A  278 HT6A    DC    XL2'408A'
                   0C3B  279 EOJISU  EQU   *
  0C3B F3 40 04          280         SIO   SDISAB,SCNTRL          DISABLE INTERRUPTS
  0C3E F3 43 08          281         SIO   RE,SCTL1               RESPOND TO EOJ
  0C41 C0 87 0C45        282         B     *+4
  0C45 C0 87 022A        283         B     LOAD                   TERMINATE
  0C49 00          0C49  284         DC    XL1'00'                NORMAL
```

4042 3741 DIAGNOSTIC FUNCTION TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                286 **************
                                287 * RTN 02     *
                                288 ***************************************
                                289
   0C4A 02                 0C4A 290 RTN02  DC    XL1'02'          ROUTINE NO.
   0C4B 80                 0C4B 291        DC    XL1'80'          MANUAL INTERVENTION
   0C4C FFFF               0C4D 292        DC    XL2'FFFF'        THIS IS LAST
                                293
   0C4E 3C 07 0CD0              294        MVI   JRW+1,X'07'      SET UP SO PROGRAM SELECTS READ OR WRT
   0C52 C0 87 021A              295        B     PRINT            ROUTINE 2 HEADING
   0C56 46                 0C56 296        DC    XL1'46'
   0C57 77                 0C57 297        DC    AL1(HD3-HD3B)
   0C58 169B               0C59 298        DC    AL2(HD3)
   0C5A 40F6               0C5B 299        DC    XL2'40F6'
   0C5C 38 04 020A              300 LOOP2  TBN   SBYTE2,SSW15   IF SSW 15 IS ON, DON'T HALT.
   0C60 F2 10 06                301        JT    KEEPON
   0C63 C0 87 0222              302        B     HALT             HALT BEFORE EXECUTION OF RTN
   0C67 40F6               0C68 303 HTF6   DC    XL2'40F6'
                                304
   0C69 3C FF 1C50              305 KEEPON MVI   EXPFLG,X'FF'     EXPECT INTERRUPT
   0C6D C0 87 0CA3              306        B     RW               DO READ OR WRITE
   0C71 F3 40 04                307        SIO   SDISAB,SCNTRL    DISABLE INTERRUPTS
   0C74 3D 41 0D16              308        CLI   DOSIO+1,SREAD    IF WE READ, PRINT RESULTS
   0C78 C0 81 0C88              309        BE    RDDONE
   0C7C C0 87 021A              310        B     PRINT            WRITE WAS DONE.
   0C80 06                 0C80 311        DC    XL1'06'
   0C81 4F                 0C81 312        DC    AL1(HD5-HD5B)
   0C82 1761               0C83 313        DC    AL2(HD5)
   0C84 C0 87 0C5C              314        B     LOOP2
                                315
                                316 RDDONE B     PRINT
   0C88 C0 87 021A              317        DC    XL1'02'
   0C8C 02                 0C8C 318        DC    AL1(HD4-HD4B)
   0C8D 77                 0C8D 319        DC    AL2(HD4)
   0C8E 1712               0C8F 320
                                321        MVC   X'8FF'(128),BUFF1+127   PUT BUFF IN DCP PRINT BUFFER
   0C90 0C 7F 08FF 11F5         322        B     PRINT
   0C96 C0 87 021A         0C9A 323        DC    XL1'22'
   0C9A 22                      324        B     DUMP1                 PRINT BUFFER IN HEX
   0C9B C0 87 10DF              325        B     LOOP2                 GO BACK
   0C9F C0 87 0C5C              326 *  1. OPEN/CLOSE DISK  2. F.S.LOWER   CHAR ADV 3. 43---128
                                327 *  4. F.S.LOWER   X    5. TYPE MESSAGE        6. F.S.LOWER  N
                                328 *  8. FIELD COR     ---->
                                329 *
                                330 *  1. F.S.LOWER  CHAR ADV  2. F.S.LOWER   W    3.  FIELD COR  <----
                                331 *
                                332 *
```


4042 3741 DIAGNOSTIC FUNCTION TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                334 **************
                                335 *  RW          *
                                336 ************************************************
                                337 *    READ OR WRITE ROUTINE.                    *
                                338 *     READS OR WRITES DUE TO PREVIOUS SET UP OR *
                                339 *     AS SET UP AT 3741 (SEE JRW JUMP)          *
                                340 ************************************************
                                341
   0CA3 34 08 0DFC              342 RW     ST    RWR+3,ARR        SET UP RETURN
   0CA7 C0 87 0F8C              343        B     GETINT           WAIT FOR INTERRUPT
                                344
   0CAB 30 43 1C7C              345        SNS   SNS3,SLINES      SNS IO TRANSFER LINES
   0CAF 39 FC 1C7C              346        TBF   SNS3,X'80'+EDS+BIPE+EOR+EOJ+AT INVALID REASON FOR INTR ?
   0CB3 C0 90 0DFD              347        BF    STATER           IF NOT OFF, GO PRINT STATUS ERROR
                                348
   0CB7 38 04 1C7B              349        TBN   SNS3-1,X'04'     IS THIS THING ON-LINE
   0CBB C0 90 10C7              350        BF    OFFLN
                                351
                                352 *  MAKE SURE ONE AND ONLY ONE MODE IS ON.
   0CBF 38 03 1C7B              353        TBN   SNS3-1,X'03'     SEE IF BOTH READ AND WRITE MODE ON
   0CC3 C0 10 1059              354        BT    BADMOD           STATUS ERROR IF BOTH ON
   0CC7 39 03 1C7B              355        TBF   SNS3-1,X'03'     SEE IF BOTH READ AND WRITE MODE OFF
   0CCB C0 10 1059              356        BT    BADMOD           STATUS ERROR IF BOTH OFF
                                357
                                357
                                357
                                358 *  SELECT SET UP AS PER PROGRAM OR AS PER 3741.  JUMP IS ALTERED.
   0CCF F2 00 12                359 JRW    JC    EXT,*-*
                                360
                                360
                                360
                                361 *  SET UP READ OR WRITE ACCORDING TO 3741 (READ OR WRITE IS ON)
   0CD2 3C 42 0D16              362        MVI   DOSIO+1,SWRITE
   0CD6 38 01 1C7B              363        TBN   SNS3-1,X'01'     IF READ MODE ON (S/3 WRITE)
   0CDA F2 10 29                364        JT    MODEOK
                                365
   0CDD 3C 41 0D16              366        MVI   DOSIO+1,SREAD
   0CE1 F2 87 22                367        J     MODEOK                 THEN CONTINUE READ
                                368
                                368
                                368
                                369 *  SET UP READ OR WRITE ACCORDING TO PROGRAM
   0CE4 3D 41 0D16              370 EXT    CLI   DOSIO+1,SREAD    IS THIS A READ SIO
   0CE8 F2 81 0F                371        JE    ISREAD
                           0CEB 372 ISWRIT EQU   *
   0CEB 38 01 1C7B              373        TBN   SNS3-1,X'01'     MAKE SURE READ MODE ON
   0CEF 39 02 1C7B              374        TBF   SNS3-1,X'02'       AND WRITE MODE OFF
   0CF3 C0 90 0F43              375        BF    SETER
   0CF7 F2 87 0C                376        J     MODEOK           IF OK, GO ON
                                377
                           0CFA 378 ISREAD EQU   *
   0CFA 38 02 1C7B              379        TBN   SNS3-1,X'02'     MAKE SURE 3741 WRITE MODE ON
   0CFE 39 01 1C7B              380        TBF   SNS3-1,X'01'       AND READ MODE OFF
   0D02 C0 90 0F43              381        BF    SETER
                                382
                                382
                                382
                           0D06 383 MODEOK EQU   *
   0D06 F3 43 08                384        SIO   RE,SCTL1         RESPOND TO WRITE/READ MODE
   0D09 31 42 1C72              385        LIO   LENGTH,LLCR      LOAD LENGTH COUNT REGISTER (7F)
   0D0D 31 44 1278              386        LIO   BUFF1@,LCAR      LOAD DATA ADDRESS REGISTER
   0D11 3C FF 1C50              387        MVI   EXPFLG,X'FF'     EXPECT AN INTERRUPT
                                388
                                389 *                             ------------
   0D15 F3 00 00                390 DOSIO  SIO   X'00',*-*         SIO TO READ OR WRITE
                                391 *                             ------------
   0D18 3C 02 0EA9              392 BLP    MVI   WSEC,2           WAIT 2 SEC FOR NOT BUSY (1 RECORD)
   0D1C C1 42 CD23              393 WAITBY TIO   ISBSY,TBSY       BRANCH IF BUSY
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0D20 F2 87 0C                394          J     SNOTBY
 0D23 C0 87 0E5A              395 ISBSY    B     WAIT                *WAIT
 0D27 C0 87 0EED              396          B     TOOBSY              *WAIT* COMES HERE IF TIMEOUT
 0D2B C0 87 0D1C              397          B     WAITBY              *WAIT* COMES HERE NORMALLY
                       0D2F   398 SNOTBY EQU   *
 0D2F C1 42 0D2F              399          TIO   *,TBSY
 0D33 C0 87 0F8C              400          B     GETINT              WAIT FOR INTERRUPT
                              401
                              402
 0D37 30 43 1C7C              403          SNS   SNS3,SLINES         SNS I/O TRANSFER LINES
 0D3B 0C 01 1C7A 1C82         404          MVC   SNS2(2),SNS2I       MOVE IN SNS AS PICKED UP IN INT RTN.
                              405
 0D41 3C FF 1C50              406          MVI   EXPFLG,X'FF'        EXPECT NEXT INT
                              407 * CHECK FOR NO-OP
                              408
 0D45 38 04 1C79              409          TBN   SNS2-1,X'04'        QUIT IF NO-OP BIT ON.
 0D49 C0 90 0D60              410          BF    NOOPOK
                              411
 0D4D F3 43 50                412          SIO   RSR+REOJ,SCTL1      SENSE RESPONSE/EOJ
 0D50 C0 87 021A              413          B     PRINT               NO-OP'D SIO
 0D54 C6                0D54  414          DC    XL1'C6'
 0D55 28                0D55  415          DC    AL1(MSG6-MSG6B)
 0D56 189A              0D57  416          DC    AL2(MSG6)
 0D58 4082              0D59  417          DC    XL2'4082'
                              418
 0D5A C0 87 0222              419          B     HALT
 0D5E 4082              0D5F  420 HT82     DC    XL2'4082'
                              421
                              422 * CHECK FOR DATA TRANSFER PARITY ERROR
                              423
 0D60 38 08 1C79              424 NOOPOK TBN     SNS2-1,X'08'        DATA XFER PARITY ERROR ?
 0D64 F2 90 31                425          JF    NODTPE
 0D67 F3 43 90                426          SIO   RSR+BOPE,SCTL1      SENSE RESPONSE / BUS OUT PARITY ERR
 0D6A C0 87 021A              427          B     PRINT               DATA TRANSFER REG. PARITY ERROR
 0D6E C1                0D6E  428          DC    XL1'C1'
 0D6F 27                0D6F  429          DC    AL1(MSG7-MSG7B)
 0D70 18C1              0D71  430          DC    AL2(MSG7)
 0D72 4081              0D73  431          DC    XL2'4081'
 0D74 3D 42 0D16              432          CLI   DOSIO+1,SWRITE      WAS THIS , WRITE (TO 3741)
 0D78 F2 81 0F                433          JE    PEWRIT
                       0D7B   434 PEREAD EQU   *                   PARITY ERROR WAS ON READ
 0D7B C0 87 021A              435          B     PRINT               *WHILE READING FROM 3741*
 0D7F 81                0D7F  436          DC    XL1'81'
 0D80 27                0D80  437          DC    AL1(MSG24-MSG24B)
 0D81 1B1C              0D82  438          DC    AL2(MSG24)
 0D83 C0 87 0F23              439          B     EXPFND                SO  TELL HIM EXPECTED AND FOUND
 0D87 F2 87 08                440          J     PEHALT
 0D8A C0 87 021A              441 PEWRIT B       PRINT               *WHILE WRITING TO 3741*
 0D8E 86                0D8E  442          DC    XL1'86'
 0D8F 27                0D8F  443          DC    AL1(MSG25-MSG25B)
 0D90 1B43              0D91  444          DC    AL2(MSG25)
                              445
 0D92 C0 87 0222              446 PEHALT B       HALT
 0D96 4081              0D97  447 HT81     DC    XL2'4081'
                              448
                              449 *  CHECK I/O TRANSFER LINES
                       0D98   450 NODTPE EQU   *
                              451
 0D98 39 EC 1C7C              452          TBF   SNS3,X'80'+EDS+BIPE+EOJ+AT  CHECK FOR STATUS ERRORS
 0D9C C0 90 0DFD              453          BF    STATER              IF NOT OFF, PRINT STATUS ERROR
                              454
                              455 *  CHECK FOR LCR ERROR
                              456
 0DA0 3D FF 1C7A              457          CLI   SNS2,X'FF'          LCR = FF ?
 0DA4 F2 81 38                458          JE    CKEOR               GO CHECK THAT EOR IS UP.
                              459
                              459
 0DA7 3C 01 0EA9              460          MVI   WSEC,1
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0DAB C0 87 0E5A              461 W1       B     WAIT                WAIT 1 SEC
 0DAF C0 87 0DB7              462          B     *+8
 0DB3 C0 87 0DAB              463          B     W1
                              464
 0DB7 F3 43 10                465          SIO   RSR,SCTL1           RESPONSE TO LCR ERROR
                              466
 0DBA C0 87 C21E              467          B     UNPACK              SET UP FOUND LCR VALUE
 0DBE 01                0DBE  468          DC    XL1'1'
 0DBF 1C7A              0DC0  469          DC    AL2(SNS2)
 0DC1 191C              0DC2  470          DC    AL2(MSG9)
                              471
 0DC3 C0 37 021A              472          B     PRINT
 0DC7 C1                0DC7  473          DC    XL1'C1'
 0DC8 33                0DC8  474          DC    AL1(MSG9-MSG9B)
 0DC9 191C              0DCA  475          DC    AL2(MSG9)
 0DCB 4088              0DCC  476          DC    XL2'4088'
 0DCD C0 87 021A              477          B     PRINT               *NOTE- LENGTH MUST BE 128 ...*
 0DD1 86                0DD1  478          DC    XL1'86'
 0DD2 77                0DD2  479          DC    AL1(MSG27-MSG27B)
 0DD3 1C09              0DD4  480          DC    AL2(MSG27)
 0DD5 C0 87 0222              481 LCRHLT   B     HALT                LCR ERROR
 0DD9 4088              0DDA  482 HT88     DC    XL2'4088'
 0DDB C0 87 0DD5              483          B     LCRHLT
                              484
                              484
                              484
                       0DDF   485 CKEOR  EQU   *
 0DDF 38 10 1C7C              486          TBN   SNS3,EOR            MAKE EOR IS UP (CAUSING BUSY TO DROP)
 0DE3 F2 10 10                487          JT    AOK                 IF SO, GO ISSUE RESPONSE
                              488
 0DE6 C0 87 021A              489          B     PRINT               *EOR NOT UP AFTER RECORD PROCESSED*
 0DEA C6                0DEA  490          DC    XL1'C6'
 0DEB 4F                0DEB  491          DC    AL1(MSG26-MSG26B)
 0DEC 1B92              0DED  492          DC    AL2(MSG26)
 0DEE 408F              0DEF  493          DC    XL2'408F'
 0DF0 C0 87 0222              494          B     HALT                END OF RECORD (EOR) NOT UP AFTER
 0DF4 408F              0DF5  495 HT8F     DC    XL2'408F'                 RECORD HAS BEEN PROCESSED
                              496
                              497 ***
                              498 ***      RESPOND TO SUCCESSFUL SIO
                              499 ***
                              500
 0DF6 F3 43 08                501 AOK      SIO   RE,SCTL1            RESPONSE (SIO SUCCESSFUL)
 0DF9 C0 87 0000              502 RWR      B     *-*                 RETURN TO CALLER
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                 504 ************************************************
                                 505 *     SUBROUTINES                              *
                                 506 *                                              *
                                 507 ************************************************
                                 508
                                 508
                                 509 ************
                                 510 * STATER
                                 511 ************************
                          0DFD   512 STATER EQU   *
  0DFD 34 08 0E59                513         ST    STATRR+3,ARR          SET UP RETURN
  0E01 F2 87 08                  514 EOJFLG  JC    STAT1,X'87'           CAN BE ALTERED TO IGNORE EOJ ERROR
  0E04 38 08 1C7C                515         TBN   SNS3,EOJ              IF ITS EOJ ONLY, IGNORE
  0E08 39 F7 1C7C                516         TBF   SNS3,X'FF'-EOJ
  0E0C F2 10 47                  517         JT    STATRR
                                 518
                          0E0F   519 STAT1   EQU   *
  0E0F F3 43 08                  520         SIO   RE,SCTL1              RESPOND
  0E12 C0 87 0E16                521         B     *+4
  0E16 C0 87 021E                522         B     UNPACK
  0E1A 02                0E1A    523         DC    IL1'2'
  0E1B 1C7C              0E1C    524         DC    AL2(SNS3)
  0E1D 114D              0E1E    525         DC    AL2(STATXX)
  0E1F C0 87 021A                526         B     PRINT
  0E23 C2                0E23    527         DC    XL1'C2'
  0E24 4F                0E24    528         DC    AL1(STATMG-STATB)
  0E25 1175              0E26    529         DC    AL2(STATMG)
  0E27 4083              0E28    530         DC    XL2'4083'             STATUS ERROR
                                 531
                                 532 *
                                 533 * SHIFT OFF BITS AND PUT IN MESSAGE DESCRIBING THAT BIT AND PRINT
                                 534 *
                                 535 *
  0E29 C2 01 128C                536         LA    STAB,XR1
  0E2D CC 01 1C6E 1C7C           537         MVC   WORK(2),SNS3          PUT SNS3 INTO WORK AREA
  0E33 0E 00 1C6E 1C6E           538 SPLOOP  ALC   WORK(1),WORK
  0E39 C0 A0 0E44                539         BOL   SETPT                 IF THAT BIT IS ON, GO PRINT
  0E3D D2 01 14                  540         LA    SLEN(,XR1),XR1
  0E40 C0 87 0E33                541         B     SPLOOP                CONTINUE UNTIL BIT FOUND
                          0E44   542 SETPT   EQU   *
  0E44 34 01 0E4F                543         ST    PB,XR1                POINT TO LINE WHICH DESCRIBES BIT
                                 544
  0E48 C0 87 021A                545         B     PRINT
  0E4C 86                0E4C    546         DC    XL1'86'
  0E4D 14                0E4D    547         DC    AL1(SLEN)
  0E4E 0000              0E4F    548 PB      DC    AL2(*-*)
                                 549
  0E50 C0 87 0222                550         B     HALT                  ERROR DURING WAIT FOR R/W MODE
  0E54 4083              0E55    551 MT83    DC    XL2'4083'
                                 552
  0E56 C0 87 0000                553 STATRR B      *-*       RETURN
                                 554
                                 554
                                 554
                                 555 ************
                                 556 * WAIT    *
                                 557 ****************************************
                                 558 *   SUBROUTINE  WAITS 1 MILLI SEC PER CALL.  AFTER EACH SEC IT
                                 559 *    DECREMENTS SECOND COUNT.
                                 560 *     SAMPLE LINKAGE --
                                 561 *
                                 562 *              MVI   WSEC,5      BEFORE LOOP, SET UP # OF SECONDS
                                 563 *        LOOP  B     WAIT       <---  LINKAGE TO TIMEOUT ROUTINE
                                 564 *              B     TIMOUT     <---  WAIT RETURNS HERE FOR TIMOUT
                                 565 *              B     LOOP       <---  WAIT RETURNS HERE NOMALLY
                                 566 *
                                 567 ****************************************
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                 568
                          0E5A   569 WAIT    EQU   *
  0E5A 34 08 0EA5                570         ST    WAITR+3,ARR           SET UP RETURN
  0E5E 3D 00 0EA9                571         CLI   WSEC,0                NEW COUNT VALUE ?
  0E62 F2 81 12                  572         JE    OLDSEC
  0E65 0C 01 0EAB 0EA9           573         MVC   WSECA(2),WSEC         PUT NEW SEC COUNT INTO WORK
  0E6B 0F C1 0EA9 0EA9           574         SLC   WSEC(2),WSEC          ZERO THE MAIN SEC COUNT.
  0E71 0C 01 0EA7 0EAD           575         MVC   WCNT(2),W1000         SET UP TO DO 1000 TIMES
  0E77 0D FF 0E77 0E77           576 OLDSEC  CLC   *(256),*              WAIT 1 MILLI
  0E7D 0D 38 0E7D 0E7D           577         CLC   *(60),*
  0E83 0F 01 0EA7 0EAF           578         SLC   WCNT(2),W0001         DO 1000 TIMES
  0E89 F2 01 10                  579         JNZ   WAITRN                  THROUGH LOOP
  0E8C 0C 01 0EA7 0EAD           580         MVC   WCNT(2),W1000         SET UP TO DO ANOTHER 1000 MILLI SEC
  0E92 0F C1 0EAB 0EAF           581         SLC   WSECA(2),W0001        DECREMENT NUMBER OF SEC TO WAIT
  0E98 C0 81 0EA2                582         BZ    WAITR                 IF IT TIMED OUT, RETURN DIRECTLY
  0E9C 0E 01 0EA5 0EB1           583 WAITRN  ALC   WAITR+3(2),W0004       RETURN TO CALLER +4
  0EA2 C0 87 0000                584 WAITR  B      *-*
                                 585
  0EA6 0000              0EA7    586 WCNT    DC    XL2'0000'
  0EA8 0000              0EA9    587 WSEC    DC    XL2'0000'
  0EAA 0000              0EAB    588 WSECA   DC    XL2'0000'
  0EAC 03E8              0EAD    589 W1000   DC    XL2'1000'
  0EAE 0001              0EAF    590 W0001   DC    XL2'1'
  0EB0 0004              0EB1    591 W0004   DC    XL2'4'
                                 592
                                 592
                                 592
                                 592
                                 593 ************
                                 594 * CHGBUF   *
                                 595 *          *
                                 596 ************************************************************
                                 597 *   CHANGE BUFFER FOR WRITE OR READ.                       *
                                 598 *       PATTERN - 55 AA FF 01 00 55 AA FF 01 00  ...       *
                                 599 ************************************************************
                                 600
  0EB2 34 08 0EEC                601 CHGBUF  ST    CHGBUR+3,ARR          FOR RETURN
  0EB6 3D 01 1C57                602         CLI   CHAR,X'01'            IF CHAR IS 01, FORCE TO 00
  0EBA F2 01 07                  603         JNE   CHG1
  0EBD 3C 00 1C57                604         MVI   CHAR,X'00'
  0EC1 F2 87 0D                  605         J     NORAP                 DON'T DO ALC
                          0EC4   606 CHG1    EQU   *
                                 607
  0EC4 0E 00 1C57 1C4F           608         ALC   CHAR(1),INCVAL
  0ECA F2 20 04                  609         JNOL  NORAP
  0ECD 3C 01 1C57                610         MVI   CHAR,X'01'            AFTER FF FORCE TO 01 FOR P BIT OFF
                          0ED1   611 NORAP   EQU   *
  0ED1 0C 00 1275 1C57           612         MVC   BUFF2+127(1),CHAR
  0ED7 0C 7E 1274 1275           613         MVC   BUFF2+126(127),BUFF2+127 PROPOGATE
  0EDD 06 02 1C68 1C68           614         AZ    SEQ(3),NUMONE         INCREMENT EBCDIC RECORD COUNTER
  0EE3 0C 02 11FB 1C6B           615         MVC   BUFF245(3),SEQ          AND PUT IT INTO BUFFER
                                 616
  0EE9 C0 87 0000                617 CHGBUR B      *-*                   RETURN TO CALLER
                                 618
                                 618
                                 618
                                 619 ************
                                 620 * TOOBSY   *
                                 621 ********************************
                                 622 *  BUSY TOO LONG (TIMEOUT)     *
                                 623 *                              *
                                 624 ********************************
                                 625
                          0EED   626 TOOBSY  EQU   *
  0EED C0 87 021A                627         B     PRINT                 BUSY TOO LONG
  0EF1 C6                0EF1    628         DC    XL1'C6'
  0EF2 27                0EF2    629         DC    AL1(MSG15-MSG15B)
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0EF3 1A2F             0EF4  630         DC    AL2(MSG15)
   0EF5 408E             0EF6  631         DC    XL2'408E'
   0EF7 C0 87 0222             632         B     HALT
   0EFB 408E             0EFC  633 HT8E    DC    XL2'408E'
   0EFD C0 87 0D18             634         B     BLP
                               635
                               635
                               635
                               636 ***********
                               637 * CMPER   *
                               638 ******************************
                               639 *  COMPARE ERROR             *
                               640 *                            *
                               641 ******************************
                               642
   0F01 34 08 0F22             643 CMPER   ST    CMPERR+3,ARR      FOR RETURN
   0F05 0C 02 1943 1C6B        644         MVC   MSG10(3),SEQ      PUT IN RECORD NUMBER
   0F0B C0 87 021A             645         B     PRINT             COMPARE ERROR ON RECORD XXX
   0F0F C2               0F0F  646         DC    XL1'C2'
   0F10 27               0F10  647         DC    AL1(MSG10-MSG10B)
   0F11 1943             0F12  648         DC    AL2(MSG10)
   0F13 4089             0F14  649         DC    XL2'4089'
   0F15 C0 87 0F23             650         B     EXPFND            PRINT EXPECTED AND FOUND DATA
   0F19 C0 87 0222             651         B     HALT              COMPARE ERROR
   0F1D 4089             0F1E  652 HT89    DC    XL2'4089'
   0F1F C0 87 0000             653 CMPERR  B     *-*               RETURN
                               654
                               654
                               654
                               654
                               655 ***********
                               656 * EXPFND  *
                               657 ******************************************************************
                               658 *  PRINTS EXPECTED (WRITTEN) DATA  AND  FOUND  (READ)  DATA
                               659 *
                               660 ******************************************************************
                               661
   0F23 34 08 0F42             662 EXPFND  ST    EXPFNR+3,ARR      FOR RETURN
   0F27 C0 87 021A             663         B     PRINT             DATA WRITTEN
   0F2B 81               0F2B  664         DC    XL1'81'
   0F2C 28               0F2C  665         DC    AL1(MSG20-MSG20B)
   0F2D 1A57             0F2E  666         DC    AL2(MSG20)
   0F2F C0 87 1103             667         B     DUMP2             DUMP EXPECTED BUFFER
   0F33 C0 87 021A             668         B     PRINT             DATA READ
   0F37 81               0F37  669         DC    XL1'81'
   0F38 28               0F38  670         DC    AL1(MSG21-MSG21B)
   0F39 1A7F             0F3A  671         DC    AL2(MSG21)
   0F3B C0 87 10DF             672         B     DUMP1             DUMP DATA READ BUFFER
   0F3F C0 87 0000             673 EXPFNR  B     *-*               RETURN
                               674
                               674
                               674
                               675 ***********
                               676 * SETER   *
                               677 ******************************
                               678 *  SET UP ERROR ROUTINE      *
                               679 *                            *
                               680 ******************************
                               681
   0F43 34 08 0F88             682 SETER   ST    SETERR+3,ARR      FOR RETURN
                               683
   0F47 0C 04 17FA 1C3B        684         MVC   MSG3A(5),CREAD    ASSUME READ (S/3 WRITES)
   0F4D 3D 42 0D16             685         CLI   DOSIO+1,SWRITE    WHERE WE IN A WRITE
   0F51 F2 81 06               686         JE    PRD
                               687
   0F54 0C 04 17FA 1C40        688         MVC   MSG3A(5),CWRITE   ASSUME READ (S/3 WRITES)
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0F5A C0 87 021A             689 PRD     B     PRINT                 'SET UP ERROR.  XXXXX MODE EXPECTED.'
   0F5E C2               0F5E  690         DC    XL1'C2'
   0F5F 4A               0F5F  691         DC    AL1(MSG3-MSG3B)
   0F60 1822             0F61  692         DC    AL2(MSG3)
   0F62 4085             0F63  693         DC    XL2'4085'
                               694
   0F64 38 01 1C7B             695         TBN   SNS3-1,X'01'          READ MODE ON ?
   0F68 F2 90 08               696         JF    RDOFF
   0F6B C0 87 021A             697         B     PRINT       PRINT READ MODE FOUND ON
   0F6F 86               0F6F  698         DC    XL1'86'
   0F70 28               0F70  699         DC    AL1(MSG4-MSG4B)
   0F71 184A             0F72  700         DC    AL2(MSG4)
                               701
   0F73 38 02 1C7B       0F73  702 RDOFF   EQU   *
   0F77 F2 90 08               703         TBN   SNS3-1,X'02'          WRITE MODE ON ?
   0F7A C0 87 021A             704         JF    WTOFF
                               705         B     PRINT       PRINT WRITE MODE FOUND ON
   0F7E 86               0F7E  706         DC    XL1'86'
   0F7F 28               0F7F  707         DC    AL1(MSG5-MSG5B)
   0F80 1872             0F81  708         DC    AL2(MSG5)
                               709
   0F82 C0 87 0222             710 WTOFF   B     HALT        SET UP ERROR
   0F86 4085             0F87  711 HT85    DC    XL2'4085'
   0F88 C0 87 0000             712 SETERR  B     *-*                   RETURN TO CALLER
                               713
                               713
                               713
                               713
                               714 ***********
                               715 * GETINT  *
                               716 ******************************
                               717 *  WAIT FOR AN INTERRUPT     *
                               718 *                            *
                               719 ******************************
                               720
   0F8C 34 08 1013             721 GETINT  ST    GETR+3,ARR        FOR RETURN
   0F90 3C 07 0EA9             722         MVI   WSEC,7            WAIT 7 SEC FOR INTERRUPT
   0F94 3D C5 0200             723         CLI   CPU,C'E'          IF THIS IS MODEL 'E' (15) ENABLE INT
   0F98 F2 81 23               724         JE    HNGINT
                               725
                               726 *   WAIT FOR INTERRUPT PENDING
   0F9B 30 42 1C7A             727 HNGPND  SNS   SNS2,SSTAT
   0F9F 0C 01 1C82 1C7A        728         MVC   SNS2I(2),SNS2     SIMULATE SNSING IN INTERRUPT ROUTINE
   0FA5 38 20 1C79             729         TBN   SNS2-1,X'20'      IS INTERRUPT PENDING BIT ON ?
   0FA9 F2 10 0C               730         JT    INTOC
   0FAC C0 87 0E5A             731         B     WAIT              WAIT UNTIL IT DOES
   0FB0 C0 87 0FE0             732         B     NOIERR
   0FB4 C0 87 0F9B             733         B     HNGPND
   0FB8 F3 40 01               734 INTOC   SIO   SRESET,SCNTRL     RESET IT WHEN IT COMES
   0FBB F2 87 1A               735         J     PEND
                               736
                         0FBE  737 HNGINT  EQU   *
   0FBE 35 84 1C59             738         L     INT5@,IAR5        LOAD INTERUPT 5 IAR.
   0FC2 F3 40 02               739         SIO   SENAB,SCNTRL      ENABLE INTERRUPTS
                               740
   0FC5 3D FF 1C5A             741 HNGIT   CLI   INTFLG,X'FF'      INTERRUPT RECEIEVED YET ?
   0FC9 F2 81 0C               742         JE    PEND
   0FCC C0 87 0E5A             743         B     WAIT              WAIT TIL IT DOES
   0FD0 C0 87 0FE0             744         B     NOIERR            TIMEDUT
   0FD4 C0 87 0FC5             745         B     HNGIT             LOOP BACK
                               746
                               746
   0FD8 3C 00 1C5A             747 PEND    MVI   INTFLG,X'00'      CLEAR INT FLAG
   0FDC C0 87 1010             748         B     GETR              GO RETURN TO CALLER
                               749
                               749
                               750 * FIRST SEE IF ON LINE.
   0FE0 30 43 1C7C             751 NOIERR  SNS   SNS3,SLINES       SNS I/O TRANSFER LINES
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0FE4 38 04 1C7B             752          TBN   SNS3-1,X'04'      ON-LINE ?
   0FE8 C0 90 10C7             753          BF    OFFLN             IF NOT, GO HALT
                               754
   0FEC 3D C5 0200             755          CLI   CPU,C'E'          IF MODEL 15, GIVE EXPECTED REAL INTS
   0FF0 F2 81 0D               756          JE    NOIE
                               757
   0FF3 C0 87 021A             758          B     PRINT             INT PEND BIT NOT ON
   0FF7 C6                0FF7 759          DC    XL1'C6'
   0FF8 28                0FF8 760          DC    AL1(MSG1-MSG1B)
   0FF9 1789              0FFA 761          DC    AL2(MSG1)
   0FFB 4084              0FFC 762          DC    XL2'4084'
   0FFD F2 87 0A               763          J     NOIHT
                               764
   1000 C0 87 021A             765 NOIE     B     PRINT             EXPECTED INTERRUPT DID NOT OCCUR
   1004 C6                1004 766          DC    XL1'C6'
   1005 4F                1005 767          DC    AL1(MSG2-MSG2B)
   1006 17D8              1007 768          DC    AL2(MSG2)
   1008 4084              1009 769          DC    XL2'4084'
                               770
   100A C0 87 0222             771 NOIHT    B     HALT              INTERRUPT DID NOT OCCUR
   100E 4084              100F 772 HT84     DC    XL2'4084'
   1010 C0 87 0000             773 GETR     B     *-*               RETURN TO CALLER
                               774
                               775 ***********
                               776 * INT5    *
                               777 *********************
                               778 *  INTERRUPT        *
                               779 *    ROUTINE        *
                               780 *********************
                          1014 781 INT5     EQU   *
   1014 34 04 1C52             782          ST    PSRSAV,PSR        SAVE PSR
   1018 30 42 1C82             783          SNS   SNS2I,SSTAT       SNS STATUS (DO BEFORE SIO TO RESET)
   101C 3D FF 1C50             784          CLI   EXPFLG,X'FF'      INTERRUPT EXPECTED ?
   1020 3C 00 1C50             785          MVI   EXPFLG,X'00'      NOT AGAIN
   1024 F2 81 0F               786          JE    WASEXP
                               787 * INT RECEIVED NOT EXPECTED FORCE A HALT.
   1027 C0 87 1028             788          B     *+4
   1028 34 20 1C54             789          ST    PIARSV,PIAR       SAVE    PROG LEVEL
   102F 35 20 1C56             790          L     UNE@,PIAR         PREPARE PROG LEVEL
   1033 F3 40 05               791          SIO   SRESET+SDISAB,SCNTRL  KILL INTERRUPT
                               792
                          1036 793 WASEXP   EQU   *
   1036 3A FF 1C5A             794          SBN   INTFLG,X'FF'      SHOW INTERRUPT OCCURRED
   103A 35 04 1C52             795          L     PSRSAV,PSR        RESTORE PSR
   103E F3 40 01               796          SIO   SRESET,SCNTRL     RESET INTERRUPT
   1041 C0 87 1014             797          B     INT5
                               798
                               798
                          1045 799 UNE      EQU   *
   1045 C0 87 021A             800          B     PRINT             UNEXP INTERRUPT.
   1049 C6                1049 801          DC    XL1'C6'
   104A 28                104A 802          DC    AL1(MSG11-MSG11B)
   104B 196B              104C 803          DC    AL2(MSG11)
   104D 4087              104E 804          DC    XL2'4087'
                               805
   104F C0 87 0222             806 HNI      B     HALT              UNEXPECTED INTERRUPT
   1053 4087              1054 807 HT87     DC    XL2'4087'
   1055 C0 87 104F             808          B     HNI
                               809
                               809
                               809
                               809
                               810 *************
                               811 *  BADMOD   *
                               812 *           *
                               813 *************************************
                               814 * READ MODE / WRITE MODE            *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               815 *   BOTH ON OR BOTH OFF.              *
                               816 *************************************
   1059 34 08 10C6             817 BADMOD ST     BADMOR+3,ARR          FOR RETURN
                               818 * PRINT BOTH FOUND ON OR BOTH FOUND OFF.
   105D 38 03 1C7B             819          TBN   SNS3-1,X'03'        SEE IF READ AND WRITE ON AT SAME TIME -
   1061 F2 90 0D               820          JF    NOT2
   1064 C0 87 021A             821          B     PRINT               BOTH MODES ON
   1068 C2                1068 822          DC    XL1'C2'
   1069 28                1069 823          DC    AL1(MSG8-MSG8B)
   106A 18E9              1068 824          DC    AL2(MSG8)
   106C 4086              106D 825          DC    XL2'4086'
   106E F2 87 0A               826          J     MDEXP               GO TELL HIM WHICH EXPECTED
                               827
   1071 C0 87 021A             828 NOT2     B     PRINT               BOTH MODES OFF
   1075 C2                1075 829          DC    XL1'C2'
   1076 27                1076 830          DC    AL1(MSG13-MSG13B)
   1077 19E1              1078 831          DC    AL2(MSG13)
   1079 408C              107A 832          DC    XL2'408C'
                               833
                               833
   107B 3D 87 0CD0             834 MDEXP    CLI   JRW+1,X'87'         IF 87, NAME MODE EXPECTED
   107F F2 81 08               835          JE    WHICH
                               836
   1082 C0 87 021A             837          B     PRINT               PRINT 'EITHER MODE EXPECTED'
   1086 86                1086 838          DC    XL1'86'
   1087 27                1087 839          DC    AL1(MSG14-MSG14B)
   1088 1AC8              1089 840          DC    AL2(MSG14)
   108A F2 87 1B               841          J     BADHLT              GO PRINT WHICH FOUND
                               842
                          108D 843 WHICH    EQU   *
   108D 0C 04 1C0E 1C3B        844          MVC   MSG40A(5),CREAD      ASSUME READ (S/3 WRITES)
   1093 3D 42 0D16             845          CLI   DOSIO+1,SWRITE      WHERE WE IN A WRITE ?
   1097 F2 81 06               846          JE    PMD
                               847
   109A 0C 04 1C0E 1C40        848          MVC   MSG40A(5),CWRITE     ASSUME READ (S/3 WRITES)
   10A0 C0 87 021A             849 PMD      B     PRINT               PRINT MODE EXPECTED ON
   10A4 86                10A4 850          DC    XL1'86'
   10A5 2D                10A5 851          DC    AL1(MSG40-MSG40B)
   10A6 1C36              10A7 852          DC    AL2(MSG40)
                               853
                               853
                          10A8 854 BADHLT   EQU   *
   10A8 38 03 1C7B             855          TBN   SNS3-1,X'03'        DECIDE FOR BOTH ON OR BOTH OFF HALT
   10AC F2 10 0A               856          JT    ONHLT
   10AF C0 87 0222             857 OFFHLT   B     HALT                READ/WRITE MODE BOTH OFF
   10B3 408C              10B4 858 HT8C     DC    XL2'408C'
   10B5 C0 87 10AF             859          B     OFFHLT
   10B9 C0 87 0222             860 CNHLT    B     HALT                READ/WRITE MODE BOTH ON
   10BD 4086              10BE 861 HT86     DC    XL2'4086'
   10BF C0 87 10B9             862          B     ONHLT
                               863
   10C3 C0 87 0000             864 BADMOR   B     *-*                 RETURN
                               865
                               865
                               865
                               865
                               866 *************
                               867 *  OFFLN    *
                               868 *           *
                               869 *************************************
                               870 * 3741 IS OFF LINE.                 *
                               871 *                                   *
                               872 *************************************
   10C7 34 08 10DE             873 OFFLN    ST    OFFLNR+3,ARR          FOR RETURN
   10CB C0 87 021A             874          B     PRINT               OFF LINE
   10CF C6                10CF 875          DC    XL1'C6'
   10D0 27                10D0 876          DC    AL1(MSG23-MSG23B)
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   10D1 1AF5             10D2  877         DC    AL2(MSG23)
   10D3 4080             10D4  878         DC    XL2'4080'
                               879
   10D5 C0 87 0222             880         B     HALT
   10D9 4080             10DA  881 HT80    DC    XL2'4080'           NOT ON-LINE
   10DB C0 87 0000             882 OFFLNR  B     *-*                 RETURN
                               883
                               883
                               883
                               883
                               884 *************
                               885 *  DUMP1    *
                               886 *           *
                               887 ***************************************
                               888 * DUMPS CONTENTS OF BUFFER 1          *
                               889 *                                     *
                               890 ***************************************
   10DF 34 08 1102             891 DUMP1   ST    DUMP1R+3,ARR        FOR RETURN
   10E3 C0 87 021E             892         B     UNPACK               UNPACK FIRST  HALF OF 128 BYTE REC
   10E7 40               10E7  893         DC    IL1'64'
   10E8 1185             10E9  894         DC    AL2(BUFF1+63)
   10EA 08FF             10EB  895         DC    XL2'8FF'            DCP BUFFER
   10EC C0 87 021A             896         B     PRINT
   10F0 A1               10F0  897         DC    XL1'A1'             FROM OWN BUFFER
                               898
   10F1 C0 87 021E             899         B     UNPACK               UNPACK SECOND HALF OF 128 BYTE REC
   10F5 40               10F5  900         DC    IL1'64'
   10F6 11F5             10F7  901         DC    AL2(BUFF1+127)
   10F8 08FF             10F9  902         DC    XL2'8FF'            DCP BUFFER
   10FA C0 87 021A             903         B     PRINT
   10FE A6               10FE  904         DC    XL1'A6'             FROM OWN BUFFER
   10FF C0 87 0000             905 DUMP1R  B     *-*                 RETURN TO CALLER
                               906
                               906
                               906
                               906
                               906
                               907 *************
                               908 *  DUMP2    *
                               909 *           *
                               910 ***************************************
                               911 * DUMPS CONTENTS OF BUFFER 2          *
                               912 *                                     *
                               913 ***************************************
   1103 34 08 1126             914 DUMP2   ST    DUMP2R+3,ARR        FOR RETURN
   1107 C0 87 021E             915         B     UNPACK               UNPACK FIRST  HALF OF 128 BYTE REC
   1108 40               1108  916         DC    IL1'64'
   110C 1235             110D  917         DC    AL2(BUFF2+63)
   110E 08FF             110F  918         DC    XL2'8FF'            DCP BUFFER
   1110 C0 87 021A             919         B     PRINT
   1114 A1               1114  920         DC    XL1'A1'             FROM OWN BUFFER
                               921
   1115 C0 87 021E             922         B     UNPACK               UNPACK SECOND HALF OF 128 BYTE REC
   1119 40               1119  923         DC    IL1'64'
   111A 1275             111B  924         DC    AL2(BUFF2+127)
   111C 08FF             111D  925         DC    XL2'8FF'            DCP BUFFER
   111E C0 87 021A             926         B     PRINT
   1122 A2               1122  927         DC    XL1'A2'             FROM OWN BUFFER
   1123 C0 87 0000             928 DUMP2R  B     *-*                 RETURN TO CALLER
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               930 ***************************************************
                               931 *                                                 *
                               932 *          MESSAGES                               *
                               933 *                                                 *
                               934 *                                                 *
                               935 *                                                 *
                               936 ***************************************************
                         1126  937 STATB   EQU   *-1
   1127 C960D640E3D9C1D5 114D  938 STATXX  DC    CL39'1-0 TRANSFER LINES      -SENSE 3-  XXXX'
   112F E2C6C5D9406D3C9D5      938
   1137 C5E2404040404040       938
   113F 60E2C5D5E2C540F3       938
   1147 604040E7E7E7E7         938
   114E 4040404040404C1 1175   939 STATMG  DC    CL40'       ACTIVE LINE IS NAMED BELOW      '
   1156 C3E3C9E5C540D3C9       939
   115E D5C540C9E240D5C1       939
   1166 D4C5C440C2C5D3D6       939
   116E E6404040404040         939
                               940
                               940
                         1176  941 BUFF1   EQU   *
   1176                  11F5  942         DS    CL128               READ BUFFER
                         11F6  943 BUFF2   EQU   *
   11F6                  1275  944         DS    CL128               READ BUFFER
   1276 40               1276  945         DC    CL1' '
                               946
   1277 1176             1278  947 BUFF1@  DC    AL2(BUFF1)          LEFT END OF READ FIELD
                               948
                               948
                               948
   1279 C1E3E3C1C3C8D4C5 128C  949 STAB    DC    CL20'ATTACHMENT RST      '
   1281 D5E340D9E2E34040       949
   1289 40404040               949
   128D C5D5C440D6C640C4 12A0  950         DC    CL20'END OF DATA SET     '
   1295 C1E3C140E2C5E340       950
   129D 40404040               950
   12A1 F3F7F4F140C2E4E2 12B4  951         DC    CL20'3741 BUS IN PRTY ERR'
   12A9 40C9D540D7D9E3E8       951
   12B1 40C5D9D9               951
   12B5 C5D5C440D6C640D9 12C8  952         DC    CL20'END OF RECORD       '
   12BD C5C3D6D9C4404040       952
   12C5 40404040               952
   12C9 C5D5C440D6C640D1 12DC  953         DC    CL20'END OF JOB          '
   12D1 D6C2404040404040       953
   12D9 40404040               953
   12DD F3F7F4F140C1E3E3 12F0  954         DC    CL20'3741 ATTENTION REQD '
   12E5 C5D5E3C9D6D540D9       954
   12ED C5D8C440               954
                               955
                         12F0  956 IN1A    EQU   *-1
   12F1 D9C5D406E5C540E6 1317  957 IN1B    DC    CL39'REMOVE WRAP CONNECTOR AND CONNECT 3741 '
   12F9 D9C1D740C3D6D5D5       957
   1301 C5C3E3D6D940C1D5       957
   1309 C440C3D6D5D5C5C3       957
   1311 E340F3F7F4F140         957
   1318 C3C1C2D3C5E24040 133E  958 IN1C    DC    CL39'CABLING.  INSERT A SCRATCH DISKETTE '
   1320 40C9D5E2C5D9E340       958
   1328 C140E2C3D9C1E3C3       958
   1330 C840C4C9E2D2C5E3       958
   1338 E3C54040404040         958
   133F D6D940E3C8C540C9 1365  959 IN1D    DC    CL39'OR THE I/O ADAPTER WRAP DIAGNOSTIC  '
   1347 61D640C1C4C1D7E3       959
   134F C5D940E6D9C3D740       959
   1357 C4C9C1C7D5D6E2E3       959
   135F C9C3404040404C         959
   1366 C4C9E2D2C5E3E3C5 138C  960 IN1E    DC    CL39'DISKETTE. P/N 2469460.      '
   136E 6B40D761D540F2F4        960
   1376 F6F9F4F6F04B4040        960
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    137E 4040404040404040          960
    1386 4040404040404040          960
    138D E3C8C540F3F7F4F1 1383     961 IN1     DC    CL39'THE 3741 SHOULD DISPLAY HDR1 DISPLAY.  *
    1395 40E2C8D6E4D3C440          961
    139D C4C9E2D7D3C1E840          961
    13A5 C8C4D9F140C4C9E2          961
    13AD D7D3C1E84B4040            961
                         13B3      962 IN1XB   EQU   *-1
    13B4 F3F7F4F140E2C8D6 13DA     963 IN1X    DC    CL39'3741 SHOULD DISPLAY HDR1 DISPLAY       *
    13BC E4D3C440C4C9E2D7          963
    13C4 D3C1E840C8C4D9F1          963
    13CC 40C4C9E2D7D3C1E8          963
    13D4 4040404040404040          963
                         13DA      964 IN2A    EQU   *-1
    13DB C9C640C140E2C3D9 1401     965 IN2B    DC    CL39'IF A SCRATCH DISKETTE IS USED. A DATA  *
    13E3 C1E3C3C840C4C9E2          965
    13EB D2C5E3E3C540C9E2          965
    13F3 40E4E2C5C46B40C1          965
    13FB 40C4C1E3C14040            965
    1402 E2C5E340E6C9E3C8 1428     966 IN2C    DC    CL39'SET WITH 128 BYTE RECORDS AND TWO OR   *
    140A 40F1F2F840C2E8E3          966
    1412 C540D9C5C3D6D9C4          966
    141A E240C1D5C440E3E6          966
    1422 D640D6D9404040            966
    1429 D4D6D5C540C1E5C1 144F     967 IN2D    DC    CL39'MORE AVAILABLE TRACKS MUST BE FOUND BY *
    1431 C9D3C1C2D3C540E3          967
    1439 D9C1C3D2E240D4E4          967
    1441 E2E340C2C540C6D6          967
    1449 E4D5C440C2E840            967
    1450 C4C5D7D9C5E2E2C9 1476     968 IN2     DC    CL39'DEPRESSING -REC ADV-.                  *
    1458 D5C74060D9C5C340          968
    1460 C1C4E5604B404040          968
    1468 4040404040404040          968
    1470 4040404040404040          968
                         1476      969 ASTRKS  EQU   *-1
    1477 5C5C5C5C5C5C5C5C 149D     970 ASTRK1  DC    CL39'**********************************'
    147F 5C5C5C5C5C5C5C5C          970
    1487 5C5C5C5C5C5C5C5C          970
    148F 5C5C5C5C5C5C5C5C          970
    1497 5C5C5C5C5C5C5C            970
                         149D      971 IN2XB   EQU   *-1
    149E C9C640C140E2C3D9 14C4     972 IN2XA   DC    CL39'IF A SCRATCH DISKETTE WAS USED. DEPRESS'
    14A6 C1E3C3C840C4C9E2          972
    14AE D2C5E3E3C540E6C1          972
    14B6 E240E4E2C5C46B40          972
    14BE C4C5D7D9C5E2E2            972
    14C5 60D9C5C340C1C4E5 14EB     973 IN2X    DC    CL39'-REC ADV- UNTIL SAME DATA SET AS BEFORE'
    14CD 6040E4D5E3C9D340          973
    14D5 E2C1D4C540C4C1E3          973
    14DD C140E2C5E340C1E2          973
    14E5 40C2C5C6D6D9C5            973
    14EC C9E240C6D6E405C4 1512     974 IN2XC   DC    CL39'IS FOUND.                              *
    14F4 4B4040404040404040        974
    14FC 4040404040404040          974
    1504 4040404040404040          974
    150C 4040404040404040          974
    1513 60D5E4D440E2C8C9 1539     975 IN3B    DC    CL39'-NUM SHIFT-  TYPE 41                   *
    151B C6E3604040E3E8D7          975
    1523 C540F4F140404040          975
    152B 4040404040404040          975
    1533 4040404040404040          975
    153A 60C6E4D5C3E340E2 1560     976 IN3     DC    CL39'-FUNCT SEL UPPER-  -INPUT-              *
    1542 C5D340E4D7D7C5D9          976
    154A 60404060C9D5D7E4          976
    1552 E3604040404040C0          976
    155A 4040404040404040          976
    1561 60C6E4D5C3E340E2 1587     977 IN3X    DC    CL39'-FUNCT SEL UPPER-  -OUTPUT-             *
    1569 C5D340E4D7D7C5D9          977
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    1571 60404060D6E4E3D7          977
    1579 E4E3604040404040          977
    1581 4040404040404040          977
                         1587      978 IN4B    EQU   *-1
    1588 E6C8C5D540E2C5E3 15AE     979 IN4A    DC    CL39'WHEN SET UP IS COMPLETE.               *
    1590 40E4D740C9E240C3          979
    1598 D6D4D7D3C5E3C56B          979
    15A0 4040404040404040          979
    15A8 4040404040404040          979
    15AF D9C5E2C5E340E2E8 15D5     980 IN4     DC    CL39'RESET SYSTEM/3 HALT.                   *
    15B7 E2E3C5D461F340C8          980
    15BF C1D3E34B4040404040        980
    15C7 4040404040404040          980
    15CF 4040404040404040          980
                         15D5      981 HD1B    EQU   *-1
    15D6 F5F240D9C5C3D6D9 15FC     982 HD1     DC    CL39'52 RECORDS WILL BE WRITTEN TO 3741     *
    15DE C4E240E6C9D3D340          982
    15E6 C2C540E6D9C9E3E3          982
    15EE C5D540E3D640F3F7          982
    15F6 F4F14040404040            982
                         15FC      983 HD2B    EQU   *-1
    15FD F5F240D9C5C3D6D9 1624     984 HD2     DC    CL40'52 RECORDS WILL BE READ AND COMPARED   *
    1605 C4E240E6C9D3D340          984
    160D C2C540D9C5C1C640          984
    1615 C1D5C440C3D6D4D7          984
    161D C1D9C5C4404040C0          984
                         1624      985 HD3B    EQU   *-1
    1625 E2C5E340E4D740F3 1648     986         DC    CL39'SET UP 3741 TO READ OR WRITE.  WHEN F6 *
    162D F7F4F140E3D640D9          986
    1635 C5C1C440D6D940E6          986
    163D D9C9E3C54B4040E6          986
    1645 C8C5D540C6F640            986
    164C C8C1D3E340C9E240 1673     987         DC    CL40'HALT IS RESET. SYSTEM 3 WILL READ OR   *
    1654 D9C5E2C5E36B40E2          987
    165C E8E2E3C5D440F340          987
    1664 E6C9D3D340D9C5C1          987
    166C C440D6D940404040          987
    1674 E6D9C9E3C540D6D5 1698     988 HD3     DC    CL40'WRITE ONE RECORD.                      *
    167C C540D9C5C3D6D9C4          988
    1684 4B4040404040404040        988
    169C 4040404040404040          988
    1694 4040404040404040          988
                         1698      989 HD4B    EQU   *-1
    169C D6D5C540D9C5C3D6 16C2     990         DC    CL39'ONE RECORD WAS READ.  RECORD IS PRINTED'
    16A4 D9C440E6C1E240D9          990
    16AC C5C1C44B4040D9C5          990
    16B4 C3D6D9C440C9E240          990
    16BC D7D9C9D5E3C5C4            990
    16C3 40F240E3C9D4C5E2 16EA     991         DC    CL40' 2 TIMES.  ONCE IN PRINTABLE EBCDIC.   *
    16CB 4B4040D6D5C3C540          991
    16D3 C9D540D7D9C9D5E3          991
    16DB C1C2D3C540C5C2C3          991
    16E3 C4C9C36B4040404040        991
    16EB D6D5C3C540C9D540 1712     992 HD4     DC    CL40'ONCE IN HEX.                           *
    16F3 C8C5E74B4040404040        992
    16FB 4040404040404040          992
    1703 4040404040404040          992
    170B 4040404040404040          992
                         1712      993 HD5B    EQU   *-1
    1713 D6D5C540D9C5C3D6 1739     994         DC    CL39'ONE RECORD WAS WRITTEN.  DATA USED FOR '
    171B D9C440E6C1E240E6          994
    1723 D9C9E3E3C5D54B40          994
    172B 40C4C1E3C140E4E2          994
    1733 C5C440C6D6D940            994
    173A E6D9C9E3C540E6C1 1761     995 HD5     DC    CL40'WRITE WAS SAME AS PREVIOUSLY READ.     *
    1742 E240E2C1D4C540C1          995
    174A E240D7D9C5E5C9D6          995
    1752 E4E2D3E840D9C5C1          995
```

4042 3741 DIAGNOSTIC FUNCTION TEST

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    175A C44B4040404040   995
                     1761  996 MSG1B  EQU   *-1
    1762 60C9D5E3C5D9D9E4 1789  997 MSG1   DC    CL40'-INTERRUPT PENDING- BIT DID NOT COME ON '
    176A D7E34007C5D5C4C9       997
    1772 D5C76040C2C9E340       997
    177A C4C9C440D5D6E340       997
    1782 C3D6D4C540D6D540       997
                     1789  998 MSG2B  EQU   *-1
    178A C9D5E3C5D9D9E4D7 1780  999        DC    CL39'INTERRUPT LEVEL 5 DID NOT OCCUR AFTER 7'
    1792 E34CD3C5E5C5D340       999
    179A F540C4C9C440D5D6       999
    17A2 E340D6C3C3E4D940       999
    17AA C1C6E3C5D940F7         999
    17B1 40E2C5C3D6D5C4E2 17D8 1000 MSG2   DC    CL40' SECONDS.                                '
    17B9 4B4040404040404040     1000
    17C1 4040404040404040       1000
    17C9 4040404040404040       1000
    17D1 4040404040404040       1000
                     17D8 1001 MSG3B  EQU   *-1
    17D9 F3F7F4F140E2C5E3 17FA 1002 MSG3A  DC    CL34'3741 SET UP IMPROPERLY.       XXXX'
    17E1 40E4D740C9D4D7D9       1002
    17E9 D6D7C5D9D3E84B40       1002
    17F1 4040404040E7E7         1002
    17F9 E7E7                   1002
    17FB 40D4D6C4C540C5E7 1822  1003 MSG3   DC    CL40' MODE EXPECTED ON.                       '
    1803 D7C5C3E3C5C440D6       1003
    180B D54B4040404040C0       1003
    1813 4040404040404040       1003
    181B 4040404040404040       1003
                     1822 1004 MSG4B  EQU   *-1
    1823 D9C5C1C440D4D6C4 184A  1005 MSG4   DC    CL40'READ MODE FOUND ON.                      '
    182B C540C6D6E4D5C440       1005
    1833 D6D54B4040404040       1005
    183B 4040404040404040       1005
    1843 4040404040404040       1005
                     184A 1006 MSG5B  EQU   *-1
    184B E6D9C9E3C540D4D6 1872  1007 MSG5   DC    CL40'WRITE MODE FOUND ON.                     '
    1853 C4C540C6D6E4D5C4       1007
    185B 40D6D54B4040404040     1007
    1863 4040404040404040       1007
    186B 4040404040404040       1007
                     1872 1008 MSG6B  EQU   *-1
    1873 E2C9D640D5D660D6 189A  1009 MSG6   DC    CL40'SIO NO-OP.                               '
    187B D74B4040404040C0       1009
    1883 4040404040404040       1009
    188B 4040404040404040       1009
    1893 4040404040404040       1009
                     189A 1010 MSG7B  EQU   *-1
    189B C4C1E3C140E3D9C1 18C1  1011 MSG7   DC    CL39'DATA TRANSFER REGISTER PARITY ERROR      '
    18A3 D5E2C6C5D940D9C5       1011
    18AB C7C9E2E3C5D940D7       1011
    18B3 C1D9C9E3E840C5D9       1011
    18BB D9D6D940404040         1011
                     18C1 1012 MSG8B  EQU   *-1
    18C2 C2D6E3C840D9C5C1 18E9  1013 MSG8   DC    CL40'BOTH READ AND WRITE MODE WERE ON.        '
    18CA C440C1D5C440E6D9       1013
    18D2 C9E3C540D4D6C4C5       1013
    18DA 40E6C5D9C540D6D5       1013
    18E2 4B4C4040404040C0       1013
                     18E9 1014 MSG9B  EQU   *-1
    18EA D3C5D5C7E3C840C3 1910  1015        DC    CL39'LENGTH COUNT REGISTER ERROR. EXPECTED    '
    18F2 D6E4D5E340D9C5C7       1015
    18FA C9E2E3C5D940C5D9       1015
    1902 D9D6D94B40C5E7D7       1015
    190A C5C3E3C5C44040         1015
    1911 C6C66B40C6D6E4D5 191C  1016 MSG9   DC    CL12'FF. FOUND XX'
    1919 C440E7E7               1016
                     191C 1017 MSG10B EQU   *-1
```


4042 3741 DIAGNOSTIC FUNCTION TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    191D C3D6D4D7C1D9C540 1943 1018 MSG10  DC    CL39'COMPARE ERROR.     RECORD NUMBER    XXX'
    1925 C5D9D9D6D94B4040       1018
    192D 4040400D9C5C3D6D9      1018
    1935 C440D5E4D4C2C5D9       1018
    193D 404C4040E7E7E7         1018
                     1943 1019 MSG11B EQU   *-1
    1944 E4D5C5E7D7C5C3E3 1968  1020 MSG11  DC    CL40'UNEXPECTED INTERRUPT.                    '
    194C C5C440C9D5E3C5D9       1020
    1954 D9E4D7E34B404040       1020
    195C 404C4040404040C0       1020
    1964 4040404040404040       1020
                     1968 1021 MSG12B EQU   *-1
    196C 60C5D5C440D6C640 1992  1022        DC    CL39'-END OF JOB- LINE NOT ACTIVE AFTER       '
    1974 D1D6C26040D3C9D5       1022
    197C C540D5D6E340C1C3       1022
    1984 E3C9E5C540C1C6E3       1022
    198C C5D94040404040         1022
    1993 D9C5C1C4C9D5C740 19BA  1023 MSG12  DC    CL40'READING ALL RECORDS OF DATA SET.         '
    199B C1D3D340D9C5C3D6       1023
    19A3 D9C4E240D6C640C4       1023
    19AB C1E3C140E2C5E34B       1023
    19B3 404C4040404040C0       1023
                     19BA 1024 MSG13B EQU   *-1
    19BB D9C5C1C440D4D6C4 19E1  1025 MSG13  DC    CL39'READ MODE AND WRITE MODE BOTH OFF.       '
    19C3 C540C1D5C440E6D9       1025
    19CB C9E3C540D4D6C4C5       1025
    19D3 40C2D6E3C840D6C6       1025
    19DB C64B4040404040         1025
                     19E1 1026 MSG14B EQU   *-1
    19E2 C5E7D7C5C3E3C5C4 1A08  1027 MSG14  DC    CL39'EXPECTED EITHER READ OR WRITE MODE.      '
    19EA 40C5C9E3C8C5D940       1027
    19F2 D9C5C1C440D6D940       1027
    19FA E6D9C9E3C540D4D6       1027
    1A02 C4C54B4040404040       1027
                     1A08 1028 MSG15B EQU   *-1
    1A09 F3F7F4F140C2E4E2 1A2F  1029 MSG15  DC    CL39'3741 BUSY TOO LONG.                      '
    1A11 E840E3D6D640D3D6       1029
    1A19 D5C74B4040404040       1029
    1A21 404C4040404040C0       1029
    1A29 4040404040404040       1029
                     1A2F 1030 MSG20B EQU   *-1
    1A30 C4C1E3C140D7D9C5 1A57  1031 MSG20  DC    CL40'DATA PREVIOUSLY WRITTEN WAS               '
    1A38 E5C9D6E4E2D3E840       1031
    1A40 E6D9C9E3E3C5D540       1031
    1A48 E6C1E24040404040       1031
    1A50 404C4040404040C0       1031
                     1A57 1032 MSG21B EQU   *-1
    1A58 C4C1E3C140D9C5C1 1A7F  1033 MSG21  DC    CL40'DATA READ BACK WAS                        '
    1A60 C440C2C1C3D240E6       1033
    1A68 C1E2404040404040       1033
    1A70 404C4040404040C0       1033
    1A78 4040404040404040       1033
                     1A7F 1034 MSG22B EQU   *-1
    1A80 5C6C5C605C605C40 1AA6  1035        DC    CL39'*-*-*-*  THE WRAP CONNECTOR IS STILL     '
    1A88 404CE3C8C540E6D9       1035
    1A90 C1D740C3D6D5D5C5       1035
    1A98 C3E3D6D940C9E240       1035
    1AA0 E2E3C9D3D34040         1035
    1AA7 C9D5E2E3C1D3D3C5 1ACE  1036 MSG22  DC    CL40'INSTALLED.  FOLLOW DIRECTIONS.            '
    1AAF C44B4040C6D6D3D3       1036
    1AB7 D6E640C4C9D9C5C3       1036
    1ABF E3C9D6D5E24B4040       1036
    1AC7 4040404040404040       1036
                     1ACE 1037 MSG23B EQU   *-1
    1ACF F3F7F4F140C9E240 1AF5  1038 MSG23  DC    CL39'3741 IS NOT ON LINE                      '
    1AD7 D5D6E3400D6D540D3      1038
    1ADF C9D5C54040404040       1038
    1AE7 4040404040404040       1038
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1AEF 4040404040404040        1038
                         1AF5 1039 MSG24B EQU   *-1
   1AF6 4040C4E4D9C9D5C7 1B1C 1040 MSG24  DC    CL39' DURING READ FROM 3741 TO SYSTEM 3.  '
   1AFE 40D9C5C1C440C6D9        1040
   1B06 D6D440F3F7F4F140        1040
   1B0E E3D640E2E8E2E3C5        1040
   1B16 D44CF34B404040          1040
                         1B1C 1041 MSG25B EQU   *-1
   1B1D 4040C4E4D9C9D5C7 1B43 1042 MSG25  DC    CL39' DURING WRITE TO 3741 FROM SYSTEM 3. '
   1B25 40E6D9C9E3C540E3        1042
   1B2D D640F3F7F4F140C6        1042
   1B35 D9D6D440E2E8E2E3        1042
   1B3D C5D440F34B4040          1042
                         1B43 1043 MSG26B EQU   *-1
   1B44 60C5D5C440D6C640 1B6A 1044        DC    CL39'-END OF RECORD- LINE NOT ACTIVE AFTER '
   1B4C D9C5C3D6D9C46040        1044
   1B54 D3C9D5C540D5D6E3        1044
   1B5C 40C1C3E3C9E5C540        1044
   1B64 C1C6E3C5D94040          1044
   1B6B E3D9C1D5E2C6C5D9 1B92 1045 MSG26  DC    CL40'TRANSFER OF A 128 BYTE RECORD.        '
   1B73 40D6C640C140F1F2        1045
   1B7B F840C2E8E3C540D9        1045
   1B83 C5C3D6D9C44B4040        1045
   1B8B 4040404040404040        1045
                         1B92 1046 MSG27B EQU   *-1
   1B93 4040D5D6E3C56040 1BB9 1047        DC    CL39' NOTE-  THIS ERROR CAN BE CAUSED BY  '
   1B9B 40E3C8C9E240C5D9        1047
   1BA3 D9D6D940C3C1D540        1047
   1BAB C2C540C3C1E4E2C5        1047
   1BB3 C440C2E8404040          1047
   1BBA E4E2C9D5C740C140 1BE1 1048        DC    CL40'USING A 3741 DATA SET WHOSE RECORDS ARE '
   1BC2 F3F7F4F140C4C1E3        1048
   1BCA C140E2C5E340E6C8        1048
   1BD2 D6E2C540D9C5C3D6        1048
   1BDA D9C4E240C1D9C540        1048
   1BE2 D5D6E340F1F2F840 1CC9 1049 MSG27  DC    CL40'NOT 128 BYTES IN LENGTH.              '
   1BEA C2E8E3C5E240C9D5        1049
   1BF2 40D3C5D5C7E3C84B        1049
   1BFA 404C404040404040        1049
   1C02 4040404040404040        1049
                                1050
                                1051
                                1052
                                1053
                                1054
                                1055
                                1056
                                1057
                                1058
                         1C09 1059 MSG40B EQU   *-1
   1C0A 4040404040       1C0E 1060 MSG40A DC    CL5'     '
   1C0F 40D4D6C4C540C5E7 1C36 1061 MSG40  DC    CL40' MODE EXPECTED ON.                    '
   1C17 D7C5C3E3C5C440D6        1061
   1C1F D54B404040404040        1061
   1C27 4040404040404040        1061
   1C2F 4040404040404040        1061
                                1062
   1C37 40D9C5C1C4       1C3B 1063 CREAD  DC    CL5' READ'
   1C3C E6D9C9E3C5       1C40 1064 CWRITE DC    CL5'WRITE'
                                1065 ************************************************
                                1066 *                                              *
                                1067 *                                              *
                                1068 *          DC'S                                *
                                1069 *                                              *
                                1070 *                                              *
                                1071 *                                              *
                                1072 ************************************************
                                1073
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1C41 0000             1C42 1074 S       DC    XL2'0000'      *      CONTAINS SWITCHES AS SENSED
   1C43 00               1C43 1075 S1      DC    XL1'00'        *
   1C44 00               1C44 1076 S2      DC    XL1'00'        * KEEP TOGETHER AND LENGTH 6
   1C45 00               1C45 1077 S3      DC    XL1'00'        *
   1C46 00               1C46 1078 S4      DC    XL1'00'        *
   1C47 0001             1C48 1079 ONE     DC    XL2'0001'
   1C49 0002             1C4A 1080 TWO     DC    XL2'0002'
   1C4B 0000             1C4C 1081 ZERO    DC    XL2'0000'
   1C4D F900             1C4E 1082 XF900   DC    XL2'F900'            FOR WRAP CONNECTOR SNS
   1C4F 55               1C4F 1083 INCVAL  DC    IL1'85'              BUMPS 'CHAR'
   1C50 00               1C50 1084 EXPFLG  DC    XL1'00'
   1C51 0000             1C52 1085 PSRSAV  DC    XL2'0000'
   1C53 0000             1C54 1086 PIARSV  DC    XL2'0000'
   1C55 1045             1C56 1087 UNEA    DC    AL2(UNE)       ADDRESS OF FORCED HALT DUE TO UNEXP INT
   1C57 00               1C57 1088 CHAR    DC    AL1(*-*)
   1C58 1014             1C59 1089 INT5A   DC    AL2(INT5)
   1C5A 00               1C5A 1090 INTFLG  DC    AL1(*-*)
   1C5B 00               1C5B 1091 RECCTR  DC    AL1(*-*)
   1C5C F0F0             1C5D 1092 CTBUF   DC    XL2'F0F0'
   1C5E F0F0             1C5F 1093 Z0      DC    XL2'F0F0'
   1C60 F0F1             1C61 1094 Z1      DC    XL2'F0F1'
   1C62 F0F2             1C63 1095 Z2      DC    XL2'F0F2'
   1C64 0000             1C65 1096 CTR     DC    XL2'0000'
   1C66 F0F0F1           1C68 1097 NUMONE  DC    XL3'F0F0F1'
   1C69 000000           1C6B 1098 SEQ     DC    XL3'000000'
   1C6C 00               1C6C 1099 QWORK   DC    XL1'00'
   1C6D 0000             1C6E 1100 WORK    DC    XL2'0'
   1C6F 0000             1C70 1101         DC    XL2'0'
   1C71 007F             1C72 1102 LENGTH  DC    XL2'007F'      255-L     (EG. 255-128 = 127 = X'7F')
   1C73 0000             1C74 1103 X0000   DC    XL2'0000'
   1C75 4000             1C76 1104 FUNBIT  DC    XL2'4000'       EB-1 BIT 0 *6 USEC PULSES     '
   1C77 0000             1C78 1105 SNS1    DC    XL2'0000'
   1C79 0000             1C7A 1106 SNS2    DC    XL2'0000'
   1C7B 0000             1C7C 1107 SNS3    DC    XL2'0000'
   1C7D 0000             1C7E 1108 SNS4    DC    XL2'0000'
   1C7F 0000             1C80 1109 SNS5    DC    XL2'0000'
   1C81 0000             1C82 1110 SNS2I   DC    XL2'0000'            FOR INTERRUPT LEVEL SNSING
   1C83 0000             1C84 1111 SENS    DC    XL2'0000'
   1C85 0000             1C86 1112 SENS0   DC    XL2'0000'
   1C87 0000             1C88 1113 SENS1   DC    XL2'0000'
   1C89 0000             1C8A 1114 SENS2   DC    XL2'0000'
   1C8B 0000             1C8C 1115 SENS3   DC    XL2'0000'
   1C8D 0000             1C8E 1116 SENS4   DC    XL2'0000'
   1C8F 0000             1C90 1117 SENS5   DC    XL2'0000'
   1C91 0000             1C92 1118 SENS6   DC    XL2'0000'
                                1119 ************************************************************************
                                1120 *                                                                      *
                                1121 *       EQUATES                                                        *
                                1122 *                                                                      *
                                1123 *                                                                      *
                                1124 *                                                                      *
                                1125 ************************************************************************
                                1126
                                1127 ********************************
                                1128 *       STANDARD DCP  EQUATES  *
                                1129 ********************************
                          0222 1130 HALT    EQU   X'222'
                          0216 1131 LINK    EQU   X'216'
                          021A 1132 PRINT   EQU   X'21A'
                          0212 1133 TEST    EQU   X'212'
                          021E 1134 UNPACK  EQU   X'21E'
                          0020 1135 PIAR    EQU   X'20'            PROGRAM INSTRUCTION ADDRESS REGISTER
                          0200 1136 CPU     EQU   X'200'           LOCATION OF CPU MODEL LETTER.
                          0001 1137 XR1     EQU   01
                          0002 1138 XR2     EQU   02
                          0008 1139 ARR     EQU   X'08'
                          0004 1140 PSR     EQU   X'04'
                          00C0 1141 IAR1    EQU   X'C0'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         0084 1142 IAR5    EQU   X'84'
                         0020 1143 P1IAR   EQU   X'20'
                         0200 1144 SYSTEM  EQU   512
                         0226 1145 PACK    EQU   X'226'
                         022A 1146 LOAD    EQU   X'22A'
                         0080 1147 BIT0    EQU   X'80'
                         0040 1148 BIT1    EQU   X'40'
                         0020 1149 BIT2    EQU   X'20'
                         0010 1150 BIT3    EQU   X'10'
                         0008 1151 BIT4    EQU   X'08'
                         0004 1152 BIT5    EQU   X'04'
                         0002 1153 BIT6    EQU   X'02'
                         0001 1154 BIT7    EQU   X'01'
                         0208 1155 SBYTE0  EQU   X'0208'
                         020A 1156 SBYTE2  EQU   X'020A'   SENSE SWITCH BYTE 2
                         020B 1157 SBYTE3  EQU   X'020B'   SENSE SWITCH BYTE 3
                         0020 1158 SSW02   EQU   X'20'     MANUAL INTERVENTION
                         0008 1159 SSW04   EQU   X'08'     BYPASS NON-ERROR PRINTING (DCP)
                         0001 1160 SSW07   EQU   X'01'     LOAD AND GO (DCP)
                         0080 1161 SSW10   EQU   X'80'
                         0040 1162 SSW11   EQU   X'40'
                         0020 1163 SSW12   EQU   X'20'
                         0010 1164 SSW13   EQU   X'10'
                         0008 1165 SSW14   EQU   X'08'
                         0004 1166 SSW15   EQU   X'04'
                         0002 1167 SSW16   EQU   X'02'
                         0001 1168 SSW17   EQU   X'01'
                         0080 1169 SSW18   EQU   X'80'
                         0040 1170 SSW19   EQU   X'40'
                         0020 1171 SSW1A   EQU   X'20'
                         0001 1172 SSW2F   EQU   X'01'
                              1173
                         0034 1174 NUMREC  EQU   52                READ 52 RECORDS
                         0014 1175 SLEN    EQU   20
                              1176
                              1177 ********************************************
                              1178 *       EQUATE USE FOR PROGRAM CODING      *
                              1179 ********************************************
                         0003 1180 H1      EQU   X'03'
                         0071 1181 HZ      EQU   X'71'
                         003C 1182 HF      EQU   X'3C'
                         007C 1183 HE      EQU   X'7C'
                         0068 1184 HL      EQU   X'68'
                         006F 1185 H0      EQU   X'6F'
                         0076 1186 H2      EQU   X'76'
                         0057 1187 H3      EQU   X'57'
                         001B 1188 H4      EQU   X'1B'
                         005D 1189 H5      EQU   X'5D'
                         007D 1190 H6      EQU   X'7D'
                         0007 1191 H7      EQU   X'07'
                         007F 1192 H8      EQU   X'7F'
                         005F 1193 H9      EQU   X'5F'
                         003F 1194 HA      EQU   X'3F'
                         0079 1195 HB      EQU   X'79'
                         006C 1196 HC      EQU   X'6C'
                         0073 1197 HD      EQU   X'73'
                         0004 1198 HUP     EQU   X'04'
                         0040 1199 HDN     EQU   X'40'
                              1200 ****************************
                              1201 *
                              1202 *  EQUATES FOR 3741
                              1203 *
                              1204 ****************************
                              1205
                              1206 * TIO
                              1207
                         0040 1208 TNR     EQU   X'40'     TIO NOT READY OR ERROR
                         0042 1209 TBSY    EQU   X'42'     TIO FOR BUSY
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1210
                              1211 * LIO
                              1212
                         0041 1213 LFUNC   EQU   X'41'     LIO FUNCTION REGISTER
                         0042 1214 LLCR    EQU   X'42'     LIO LENGTH COUNT REGISTER
                         0044 1215 LDAR    EQU   X'44'     LIO DATA ADDRESS REGISTER
                         0045 1216 LDTR    EQU   X'45'     LIO DATA TRANSFER REGISTER
                              1217
                              1218 * SIO
                              1219
                         0040 1220 SCNTRL  EQU   X'40'     SIO CONTROL INTERRUPT STATUS
                         0041 1221 SREAD   EQU   X'41'     SIO READ
                         0042 1222 SWRITE  EQU   X'42'     SIO WRITE
                         0043 1223 SCTL1   EQU   X'43'     SIO I/O CONTROL 1
                         0044 1224 SCTL2   EQU   X'44'     SIO I/O CONTROL 2
                              1225
                              1226 * SNS
                              1227
                         0041 1228 SFUNR   EQU   X'41'     SNS FUNCTION REGISTER
                         0042 1229 SSTAT   EQU   X'42'     SNS CCR + STATUS     (STAT=EB2)
                         0043 1230 SLINES  EQU   X'43'     SNS I/O TRANSFER LINES
                         0044 1231 SDAR    EQU   X'44'     SNS DATA ADDRESS REGISTER (DAR)
                         0045 1232 SDXFR   EQU   X'45'     SNS DATA TRANSFER + DIAG   (DIAG=EB2)
                              1233
                              1234 * R-BYTES FOR SIO 0
                              1235
                              1236 *                         BIT
                         0001 1237 SRESET  EQU   X'01'      7      SIO I-R  RESET INTERRUPT
                         0002 1238 SENAB   EQU   X'02'      6      SIO I-R  ENABLE INTERRUPTS
                         0004 1239 SDISAB  EQU   X'04'      5      SIO I-R  DISABLE INTERRUPTS
                         0008 1240 SNOBSY  EQU   X'08'      4      SIO I-R  FORCE NOT BUSY
                         0010 1241 SUPINT  EQU   X'10'      3      SIO I-R  SET INTERRUPT REQUEST
                              1242
                              1242
                              1243 * ERROR MASKS SNS-3
                              1244
                              1245 *
                         0040 1246 EDS     EQU   X'40'              END OF DATA SET
                         0020 1247 BIPE    EQU   X'20'              BUSS IN PARITY ERROR
                         0010 1248 EOR     EQU   X'10'              END OF RECORD
                         0008 1249 EOJ     EQU   X'08'              END OF JOB
                         0004 1250 AT      EQU   X'04'              3741 ATTENTION
                              1251 *
                              1252
                              1253 *                    I/O SELECT
                              1254 *                      LINE #          MEANING
                              1255 *                       1,2            NOT USED
                         0004 1256 RSU     EQU   X'04'   3              SET UP ERROR (READ VS. WRITE MODE)
                         0008 1257 RE      EQU   X'08'   4              RESPONSE
                         0010 1258 RSR     EQU   X'10'   5              SENSE RESPONSE
                         0020 1259 REOD    EQU   X'20'   6              END OF DATA SET
                         0040 1260 REOJ    EQU   X'40'   7              END OF JOB
                         0080 1261 BOPE    EQU   X'80'   8              BUS OUT PARITY ERROR
                         FFFF 1262         END
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
AOK	A	003	0DF6	0501	0487
ARR	C	001	0C08	1139	0342 0513 0570 0601 0643 0662 0682 0721 0817 0873 0891 0914
ASTRKS	A	001	1476	0969	0045 0054 0080 0084 0104 0108 0112 0118 0186 0199 0217 0223
ASTRK1	A	039	149D	0970	0045 0046 0054 0055 0080 0081 0084 0085 0104 0105 0108 0109
					0112 0113 0118 0119 0186 0187 0199 0200 0217 0218 0223 0224
AT	C	001	0004	1250	0346 0452
BADHLT	A	001	10A8	0854	0841
BADMOD	A	004	1059	0817	0354 0356
BADMOR	A	004	10C3	0864	0817*
BEG	A	004	0A21	0043	0149
BIPE	C	001	0020	1247	0346 0452
BIT0	C	001	0080	1147	
BIT1	C	001	0040	1148	
BIT2	C	001	0020	1149	
BIT3	C	001	0010	1150	
BIT4	C	001	0008	1151	
BIT5	C	001	0004	1152	
BIT6	C	001	0002	1153	
BIT7	C	001	0001	1154	
BLP	A	004	0D18	0392	0634
BOPE	C	001	0080	1261	0426
BUFF1	A	001	1176	0941	0168* 0259 0321 0894 0901 0947
BUFF1@	A	002	1278	0947	0386
BUFF2	A	001	11F6	0943	0160* 0161 0161* 0163* 0168 0251* 0252 0252* 0254* 0259 0612* 0613
					0613* 0615* 0917 0924
CHAR	A	001	1C57	1088	0156* 0160 0250* 0251 0602 0604* 0608* 0610* 0612
CHGBUF	A	004	0EB2	0601	0172 0263
CHGBUR	A	004	0EE9	0617	0601*
CHG;	A	001	0EC4	0606	0603
CKEOR	A	001	0DDF	0485	0458
CMPER	A	004	0F01	0643	0260
CMPERR	A	004	0F1F	0653	0643*
CPU	C	001	0200	1136	0723 0755
CREAD	A	005	1C38	1063	0684 0844
CTBUF	A	002	1C5D	1092	
CTR	A	002	1C65	1096	
CWRITE	A	005	1C40	1064	0688 0848
DOSIO	A	003	0D15	0390	0158* 0249* 0308 0362* 0366* 0370 0432 0685 0845
DUMP1	A	004	10DF	0891	0324 0672
DUMP1R	A	004	10FF	0905	0891*
DUMP2	A	004	1103	0914	0667
DUMP2R	A	004	1123	0928	0914*
EDS	C	001	0040	1246	0346 0452
ENDR	A	001	0C1C	0266	0262
ENDW	A	001	0B48	0175	0171
EOJ	C	001	0C08	1249	0269 0346 0452 0515 0516
EOJFLG	A	003	0ED1	0514	
EOJISU	A	001	0C3B	0279	0270
EOR	C	001	0010	1248	0346 0486
EXPFLG	A	001	1C50	1084	0041* 0183* 0305* 0387* 0406* 0784 0785*
EXPFND	A	004	0F23	0662	0439 0650
EXPFNR	A	004	0F3F	0673	0662*
EXT	A	004	0CE4	0370	0359
FUNBIT	A	002	1C76	1104	0038
GETINT	A	004	0F8C	0721	0176 0267 0343 0400
GETR	A	004	1010	0773	0721* 0748
HA	C	001	003F	1194	
HALT	C	001	0222	1130	0136 0241 0277 0302 0419 0446 0481 0494 0550 0632 0651 0710
					0771 0806 0857 0860 0880
HB	C	001	0079	1195	
HC	C	001	006C	1196	
HD	C	001	0073	1197	
HDN	C	001	0040	1199	
HD1	A	039	15FC	0982	0050 0051
HD1B	A	001	15D5	0981	0050
HD2	A	040	1624	0984	0191 0192

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
HD2B	A	001	15FC	0983	0191
HD3	A	040	169B	0988	0297 0298
HD3B	A	001	1624	0985	0297
HD4	A	040	1712	0992	0318 0319
HD4B	A	001	169B	0989	0318
HD5	A	040	1761	0995	0312 0313
HD5B	A	001	1712	0993	0312
HE	C	001	007C	1183	
HF	C	001	003C	1182	
HL	C	001	0068	1184	
HNGINT	A	001	0FBE	0737	0724
HNGIT	A	004	0FC5	0741	0745
HNGPND	A	004	0F9B	0727	0733
HNI	A	004	104F	0806	0808
HTF1	A	002	0AE2	0137	
HTF2	A	002	0B03	0242	
HTF6	A	002	0C68	0303	
HT8A	A	002	0C3A	0278	
HT8C	A	002	10B4	0858	
HT8E	A	002	0EFC	0633	
HT8F	A	002	0DF5	0495	
HT80	A	002	10DA	0881	
HT81	A	002	0D97	0447	
HT82	A	002	0D5F	0420	
HT83	A	002	0E55	0551	
HT84	A	002	100F	0772	
HT85	A	002	0F87	0711	
HT86	A	002	10BE	0861	
HT87	A	002	1054	0807	
HT88	A	002	0DCA	0482	
HT89	A	002	0F1E	0652	
HUP	C	001	0004	1198	
HZ	C	001	0071	1181	
H0	C	001	006F	1185	
H1	C	001	0003	1180	
H2	C	001	0076	1186	
H3	C	001	0057	1187	
H4	C	001	0018	1188	
H5	C	001	005D	1189	
H6	C	001	007D	1190	
H7	C	001	0037	1191	
H8	C	001	007F	1192	
H9	C	001	005F	1193	
IAR1	C	001	00C0	1141	
IAR5	C	001	0084	1142	0738*
INCVAL	A	001	1C4F	1083	0608
INTFLG	A	001	1C5A	1090	0042* 0741 0747* 0794*
INTOC	A	003	0FB8	0734	0730
INT5	A	001	1014	0781	0797 1089
INT5@	A	002	1C59	1089	0738
IN1	A	039	13B3	0961	0074 0075
IN1A	A	001	12F0	0956	0058
IN1B	A	039	1317	0957	0058 0059 0062
IN1C	A	039	133E	0958	0062 0063 0066
IN1D	A	039	1365	0959	0066 0067 0070
IN1E	A	039	138C	0960	0070 0071 0074
IN1X	A	039	13CA	0963	0195 0196
IN1XB	A	001	13B3	0962	0195
IN2	A	039	1476	0968	0100 0101
IN2A	A	001	13CA	0964	0088
IN2B	A	039	1401	0965	0088 0089 0092
IN2C	A	039	1428	0966	0092 0093 0096
IN2D	A	039	144F	0967	0096 0097 0100
IN2X	A	039	14EB	0973	0209 0210 0213
IN2XA	A	039	14C4	0972	0205 0206 0209
IN2XB	A	001	149D	0971	0205

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
IN2XC	A	039	1512	0974	0122 0213 0214 0227
IN3	A	039	1560	0976	0126 0127 0231
IN3B	A	039	1539	0975	0122 0123 0126 0227 0228
IN3X	A	039	1587	0977	0231 0232
IN4	A	039	15D5	0980	0134 0135 0239 0240
IN4A	A	039	15AE	0979	0130 0131 0134 0235 0236 0239
IN4B	A	001	1587	0978	0130 0235
ISBSY	A	004	0D23	0395	0393
ISREAD	A	001	0CFA	0378	0371
ISWRIT	A	001	0CEB	0372	
JRW	A	003	0CCF	0359	0040* 0294* 0834
KEEPON	A	004	0C69	0305	0301
LCRHLT	A	004	0DD5	0481	0483
LDAR	C	001	0044	1215	0386*
LDTR	C	001	0045	1216	0139*
LENGTH	A	002	1C72	1102	0385
LFUNC	C	001	0041	1213	0038*
LINK	C	001	0216	1131	
LLCR	C	001	0042	1214	0385*
LOAD	C	001	022A	1146	0283
LOOP2	A	004	0C5C	0300	0314 0325
MDEXP	A	004	1078	0634	0826
MODEOK	A	001	0DD6	0383	0364 0367 0376
MSG1	A	040	1789	0997	0760 0761
MSG1B	A	001	1761	0996	0760
MSG10	A	039	1943	1018	0644* 0647 0648
MSG10B	A	001	191C	1017	0647
MSG11	A	040	196B	1020	0802 0803
MSG11B	A	001	1943	1019	0802
MSG12	A	040	198A	1023	0273 0274
MSG12B	A	001	196B	1021	0273
MSG13	A	039	19E1	1025	0830 0831
MSG13B	A	001	198A	1024	0830
MSG14	A	039	1A08	1027	0839 0840
MSG14B	A	001	19E1	1026	0839
MSG15	A	039	1A2F	1029	0629 0630
MSG15B	A	001	1A08	1028	0629
MSG2	A	040	17D8	1000	0767 0768
MSG2B	A	001	1789	0998	0767
MSG20	A	040	1A57	1031	0665 0666
MSG20B	A	001	1A2F	1030	0665
MSG21	A	040	1A7F	1033	0670 0671
MSG21B	A	001	1A57	1032	0670
MSG22	A	040	1ACE	1036	0147 0148
MSG22B	A	001	1A7F	1034	0147
MSG23	A	039	1AF5	1038	0876 0877
MSG23B	A	001	1ACE	1037	0876
MSG24	A	039	1B1C	1040	0437 0438
MSG24B	A	001	1AF5	1039	0437
MSG25	A	039	1B43	1042	0443 0444
MSG25B	A	001	1B1C	1041	0443
MSG26	A	040	1B92	1045	0491 0492
MSG26B	A	001	1B43	1043	0491
MSG27	A	040	1C09	1049	0479 0480
MSG27B	A	001	1B92	1046	0479
MSG3	A	040	1822	1003	0691 0692
MSG3A	A	034	17FA	1002	0684* 0688*
MSG3B	A	001	17D8	1001	0691
MSG4	A	040	184A	1005	0699 0700
MSG4B	A	001	1822	1004	0699
MSG40	A	040	1C36	1061	0851 0852
MSG40A	A	005	1C0E	1060	0844* 0848*
MSG40B	A	001	1C09	1059	0851
MSG5	A	040	1872	1007	0707 070E
MSG5B	A	001	184A	1006	0707
MSG6	A	040	189A	1009	0415 0416

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
MSG6B	A	001	1872	1008	0415
MSG7	A	039	18C1	1011	0429 0430
MSG7B	A	001	189A	1010	0429
MSG8	A	040	18E9	1013	0823 0824
MSG8B	A	001	18C1	1012	0823
MSG9	A	012	191C	1016	0470 0474 0475
MSG9B	A	001	18E9	1014	0474
NODTPE	A	001	0D98	0450	0425
NOIE	A	004	1000	0765	0756
NOIERR	A	004	0FE0	0751	0732 0744
NOIHT	A	004	100A	0771	0763
NOOPOK	A	004	0D60	0424	0410
NORAP	A	001	0ED1	0611	0605 0609
NOT2	A	004	1071	0828	0820
NUMONE	A	003	1C68	1097	0162 0253 0614
NUMREC	C	001	0034	1174	0157 0248
OFFHLT	A	004	10AF	0857	0859
OFFLN	A	004	10C7	0873	0350 0753
OFFLNR	A	004	10D8	0882	0873*
OLDSEC	A	006	0E77	0576	0572
ONE	A	002	1C48	1079	0170 0261
ONHLT	A	004	1059	0860	0856 0862
P@	A	002	0E4F	0548	0543*
PACK	C	001	0226	1145	
PEHALT	A	004	0D92	0446	0440
PEND	A	004	0FD8	0747	0735 0742
PEREAD	A	001	0D7B	0434	
PEWRIT	A	004	0D8A	0441	0433
PIAR	C	001	0020	1135	0789 0790*
PIARSV	A	002	1C54	1086	0789*
PMD	A	004	10A0	0849	0846
PRD	A	004	0F5A	0689	0686
PRINT	C	001	021A	1132	0043 0048 0052 0056 0060 0064 0068 0072 0076 0078 0082 0086 0090 0094 0098 0102 0106 0110 0114 0116 0120 0124 0128 0132 0143 0145 0184 0189 0193 0197 0201 0203 0207 0211 0215 0219 0221 0225 0229 0233 0237 0271 0295 0310 0316 0322 0413 0427 0435 0441 0472 0477 0489 0526 0545 0627 0645 0663 0668 0689 0697 0705 0758 0765 0800 0821 0828 0837 0849 0874 0896 0903 0919 0926
PSR	C	001	0004	1140	0782 0795*
PSRSAV	A	002	1C52	1085	0782* 0795
PIIAR	C	001	0020	1143	
QWORK	A	001	1C6C	1099	
RDDONE	A	004	0C88	0316	0309
RDOFF	A	001	0F73	0702	0696
RE	C	001	0008	1257	0281 0384 0501 0520
RECCTR	A	001	1C5B	1091	0157* 0170* 0248* 0261*
REOD	C	001	0020	1259	
REOJ	C	001	0040	1260	0177 0412
RLOOP	A	004	0BF8	0258	0264
RSR	C	001	0010	1258	0177 0412 0426 0465
RSU	C	001	0004	1256	
RTN01	A	001	0A0D	0031	0017
RTN02	A	001	0CAA	0290	0033
RW	A	004	0CA3	0341	0169 0258 0306
RWR	A	004	0DF9	0502	0342*
S	A	002	1C42	1074	
SBYTE0	C	001	0208	1155	
SBYTE2	C	001	020A	1156	0300
SBYTE3	C	001	020B	1157	
SCNTRL	C	001	0040	1220	0178 0280 0307 0734 0739 0791 0796
SCTL1	C	001	0043	1223	0177 0281 0384 0412 0426 0465 0501 0520
SCTL2	C	001	0044	1224	
SDAR	C	001	0044	1231	
SDISAB	C	001	0004	1239	0178 0280 0307 0791
SDXFR	C	001	0045	1232	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SENAB	C	001	0002	1238	0739
SENS	A	002	1C84	1111	
SENSG	A	002	1C86	1112	
SENS1	A	002	1C88	1113	
SENS2	A	002	1C8A	1114	
SENS3	A	002	1C8C	1115	
SENS4	A	002	1C8E	1116	
SENS5	A	002	1C90	1117	
SENS6	A	002	1C92	1118	
SEQ	A	003	1C6B	1098	0162* 0163 0253* 0254 0614* 0615 0644
SETER	A	004	0F43	0682	0375 0381
SETERR	A	004	0F88	0712	0682*
SETPT	A	001	0E44	0542	0539
SFUNR	C	001	0041	1228	
SLEN	C	001	0014	1175	0540 0547
SLINES	C	001	0043	1230	0140 0268 0345 0403 0751
SNOBSY	C	001	0008	1240	
SNOTBY	A	001	0D2F	0398	0394
SNS1	A	002	1C78	1105	
SNS2	A	002	1C7A	1106	0404* 0409 0424 0457 0469 0727* 0728 0729
SNS2I	A	002	1C82	1110	0404 0728* 0783*
SNS3	A	002	1C7C	1107	0140* 0141 0268* 0269 0345* 0346 0349 0353 0355 0363 0373 0374 0379 0380 0403* 0452 0486 0515 0516 0524 0537 0695 0703 0751* 0752 0819 0855
SNS4	A	002	1C7E	1108	
SNS5	A	002	1C80	1109	
SPLOOP	A	006	0E33	0538	0541
SREAD	C	001	0041	1221	0249 0308 0366 0370
SRESET	C	001	0031	1237	0734 0791 0796
SSTAT	C	001	0042	1229	0727 0783
SSW02	C	001	0020	1158	
SSW04	C	001	0008	1159	
SSW07	C	001	0001	1160	
SSW1A	C	001	0020	1171	
SSW10	C	001	0080	1161	
SSW11	C	001	0040	1162	
SSW12	C	001	0020	1163	
SSW13	C	001	0010	1164	
SSW14	C	001	0008	1165	
SSW15	C	001	0004	1166	0300
SSW16	C	001	0002	1167	
SSW17	C	001	0001	1168	
SSW18	C	001	0080	1169	
SSW19	C	001	0040	1170	
SSW2F	C	001	0001	1172	
STAB	A	020	128C	0949	0536
STATB	A	001	1126	0937	0528
STATER	A	001	0DFD	0512	0347 0453
STATMG	A	040	1175	0939	0528 0529
STATRR	A	004	0E56	0553	0513* 0517
STATXX	A	039	114D	0938	0525
STAT1	A	001	0E0F	0519	0514
SUPINT	C	001	0010	1241	
SWRITE	C	001	0042	1222	0158 0362 0432 0685 0845
SYSTEM	C	001	0200	1144	
S1	A	001	1C43	1075	
S2	A	001	1C44	1076	
S3	A	001	1C45	1077	
S4	A	001	1C46	1078	
TBSY	C	001	0042	1209	0393 0395
TEST	C	001	0212	1133	
TNR	C	001	0040	1208	
TODBSY	A	001	0EED	0626	0396
TWD	A	002	1C4A	1080	
UDT1	A	003	0A0C	0019	
UNE	A	001	1045	0799	1087

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
UNE0	A	002	1C56	1087	0790
UNPACK	C	001	021E	1134	0467 0522 0892 0899 0915 0922
WAIT	A	001	0E5A	0569	0395 0461 0731 0743
WAITBY	A	004	0D1C	0393	0397
WAITR	A	004	0EA2	0584	0570* 0582 0583*
WAITRN	A	006	0E9C	0583	0579
WASEXP	A	001	1036	0793	0786
WCNT	A	002	0EA7	0586	0575* 0578* 0580*
WHICH	A	001	108D	0843	0835
WLOOP	A	001	0B29	0167	0173
WOPK	A	002	1C6E	1100	0537* 0538 0538*
WRPOFF	A	001	0B05	0150	0142
WSEC	A	002	0EA9	0587	0392* 0460* 0571 0573 0574 0574* 0722*
WSECA	A	002	0EAB	0588	0573* 0581*
WTOFF	A	004	0F82	0710	0704
W0001	A	002	0EAF	0590	0578 0581
W0004	A	002	0E81	0591	0583
W1	A	004	0DAB	0461	0463
W1000	A	002	0EAD	0589	0575 0580
XF900	A	002	1C4E	1082	0141
XR1	C	001	0001	1137	0536* 0540 0540* 0543
XR2	C	001	0002	1138	
X0000	A	002	1C74	1103	
X404	A	001	0000	0005	
ZERO	A	002	1C4C	1081	0139
Z0	A	002	1C5F	1093	
Z1	A	002	1C61	1094	
Z2	A	002	1C63	1095	

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

4042 3741 DIAGNOSTIC FUNCTION TEST

OBJECT CARD LISTING

THE CHARACTER ° INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
°GBK°GBD°°°PN°55	58775°EC°825057°	404°-°3741°FUNCT	ION°TEST°°°°°°°°	84@@84@@°°°°°°°°	°°°°°°°°40420000
T+-Y:£DH°°£°°B-7	""4A£°°F°CDY1£J1	6|H*<4C3"GE°@°A1	ĒOH*BFUHXEI5°@*B	G°/YBI1P@OH*BF-H	XEI4°#9D40420001
T+-Z5OH*BF-DXD1¬	°/OHĒ°K*L|%BG°/Y	AII(VOH*BF-DXD83	°/OHĒ°K*L%@BG°/Y	KOH*BF-DXEI7°/OH	Ē°S*°RHM40420002
T+-D̄OEI7°/OHĒ°K*	M°*BG°/YAI1£YOH*	BF-DXED"°/OHĒ°S*	M)%BG°/YAI1K)OH*	BF-DXEI7°/OHĒ°S*	MX*°°OD̄-40420003
T+-../OHĒD%BG°/Y	BI1K)OH*BF-DXELX	°/OHĒ°S*NO<BG°/Y	AI1O>OH*BF-QXE)P	°/OHS£|D1JJ1<<D<	*¬°4°:.440420004
T+-%W°J1@GD#2°JG	°/OHĒE%BG°/YBL1,	+OH*H̄HL1NGE*£(A1	$|DH(E-0°DXM*NO1	=DX£K)£0BGF%*Ē°0	BD¬%°:$M40420005
T+-_/GF%<¬1G5DXP	°/02TCO°*011H@YD	<OH*+%%BGB2X°/O_	HOH*|T|(CM|(°A<B	GB5@@"11£OH*BFUH	XEI4°ĒL040420006
T+->*£|.°/OHĒ°S-	OI<BG°/YBI1|ĒOH*	BF-DXEI7°/OHĒD%B	G°/YAI1LDOH*BF-D	XE+?°/OHĒ°S*ND%B	G°/Y 2£040420007
T+-?P°K*MX*BG°/Y	KOH*BF-HXEI7°/OH	Ē°K*N+*BG°/YBI1O	GOH*BF-DXEĒ#°/OH	ĒAS*N5*BG°SI°@TO	4GE%°¬AU40420008
T+-OK|DD(ETINGE*	<°A15GE*<¬/14DXH	<°/1.GF-<°/G*GF?	°/O2TCP@J°JI5O°D	|°£@°GE%*K<BACA3	°/08°@*B40420009
T+-1(X%BGB"T°/OO	*OH*|TCACGGO8BA1	@@/°£OH*3F%R|FSZ	°S%BG°SI°S?(°A|(	CB<BGCDP°/OHD̄°°H	°""@°K#*40420010
T+-2H|°*<4<BG°/Z	F)IĒ$£|Q8A°HH@/°	FOH*BHUC6||@*M<B	GCH̄|3£°£°££4OOHD	<S<BG°/YFL1)/OH*	<P<°°:BY40420011
T+-3C/OHĒ°X*PD-1	"B|@J°*BG°/YSOH*	&7@BGCEO4B°7@OH*	|TCACGG09"A1@OI°	("L-DGG?°UAC6+°<	*;@°°O-°40420012
T+-3=DAAR+£<*;@°	£DEX2°AM@£-40+°D	*;"H£H̄L1ACJS2/2H	°££4O@YD|+°D*;3U	BGG?°U°+C@Y*<+°H	*;3U°)T440420013
T+-49°J1#OI°|£"(	CBCEBGG*M1JA18||@	*M|<°°COBCD̄XA£-4	T@Y*<OH*+O%BGC>7	°/O4*CMH(.@BGC80	0£10°=T°40420014
T+-54¬°CAGGY*-T3	"GE°8AA190I°(Q|(	CM<BG°/.FHASĒ£M.°	°/OHS£HH8BA19@Z°	1@4+£OH*BF%DXF<E	°-L4°;YO40420015
T+-67£-4@YD|OH*	BFYOXF13°/O@T@Y*	HOH*BFYOXF4|°/OH	S£MD9#A1@OI°("L7	"GG,2-L-* £:2OH*	+D%°°*J840420016
T+-7D̄/0670H*(D̄"(	CD<BG°/@AGGYRG<B	G°/.A<1U*£HT°/OH	Ē/X**B*BG°SI°S<B	GC)M8DA1@@/°£OH*	BF%Q°=2@40420017
T+-8VL1>K£H"°/OH	S&H"3£GT°/O°°(°-	+O¬HGB3-HGG09*11	@@/A£@4<HOH**E%B	G°/8BGGOJL*EG°/.	BL1D°*AO40420018
T+-9-)MBCO-DKT°O	AGF8*¬°8°GF8*S%B	-CULK°JL°/083(°D	+L£BG°/DFE°°°OH*	BHUBCOH*°°C£HCDM	°°8¬1-40420019
T+-:$D̄¬HAD-OACD̄%	+D̄£@ACD̄U+D̄£OACD̄*	+.£7"CX*+)O4#CX4	+¬£@ACD̄*+,"HAD°O	ACD̄*+.£@ACD̄%+.@B	ACD̄H M3 40420020

4042 3741 DIAGNOSTIC FUNCTION TEST

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-#OC-D+Z£:1OH*	°°°°°°°°°°|Y°°D	°AC£HC>O°°J1P@-D	G|°°*N"H̄GC£8°GE*	*L"H-ACOAGE*<°AI	5GE*°K$440420021
T+-@JCG@K)AI5A-H	*Ē11YC°HJ=11,OH*	°°<BG°/.FI1Y7£H#°	°/OH5£H#°/O4Q(°-	|H-O8FM<*Ē@BG°/.	BI1U°4:H40420022
T+-'<£4BIOH*|H@B	G°SI°S*8G°°°4B°'	BOH*BFYDYFV¬°/1D	COH*BFYDYFX"°/1C	¬OH*°°C£HC8%<AA¬	:GC%°M/D40420023
T+-=G|MH(EYH̄AA-O	DE"Y*£<BG°/.BK/-	S£HM8°J1#8Z°HOH*	BFYQYFDY8°/1#@Z°	HOH*BFYQYFG.°/OH	S£HM°"B<40420024
T+-"BOH*°°C£HDA<	@AO:Z|*MB°|H̄AH3A	BGGY<°J2EGGY8HA1	9@/°<OH*+O%BGC=C°	°/O=$@4°A@Y*Ē(O£	*O¬<°M:Y40420025
T+-"'£°H'"11Ē@YD	<OH*+O%BGC=C°/O"	E|°°*O%BGCA°0£11	@+°£*;£B£D<*'1£H°	@YD(OH*BF%QYE8V°	/|H°$D̄<40420026
T+/°8/O.°/OHĒ1U@	P6DBDOH*BHUBDOH*	°°C£DGEHO£/2B|¬@	*MCO°GEC2-£"°/1°	.(B°*NCM-GE$3£°M	:"10°71°40420027
T+/A3OTMDGE.3£°G	°/1°MOH*BF%QYFO_	°/@BG°SI°/@BGDD@	4BACF+°<*;"H̄£C*B	G°/.BH̄ATZ£H$2/O.	°/OH°4:U40420028
T+/B>F%HXF:E°TC6	GC(C2-£?°/OHĒ/S*	ĒB|H̄CFOODC°B*+35	BCJ$2-£Q<AAO+GDC	°/OHĒ/S4*(T-CGG?	2D°Y°R.£40420029
T+/CZOH*BHUB<OH*	£.@BG°SI°/%BGD.X	°/O°°(°-£7%BG°/.	FII.S£HC°/OHS£HC	°/O°°(°-J°%BG°/9	°DSM°8J%40420030
T+/DUB|"°/OHĒY*B	G°/9°D¬MH"°@BG°/D̄	W0H*°°C£HDK$°/OH	:£AHSB|"°/OHĒY*B	G°/9°DXMH"°@BG°/D̄	SOH*°6T*40420031
T+/E¬°°CIQ(R°8'X	A5:.F1)V°4@XN1;I	°£DA°£DA-8%PN8%N	°@£A°£+¬X9=)°£DA	°£DA°0*|T2:PE£(|	I5*M"B*40420032
TEJES£<XS£(PA5<P	D£<.E4*$W£DA°£DA	°£°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°°	°°°°°¬.*40420033
T+/H̄0£AE60:|TO*|	H5<PN84CR8>(°£DA	°£DCE5*J°5%R°1<G	TOMCS1:(°£DA°£||	7°|E°O>LS£<XN£(¬	R8=-°K#440420034
T+/.,£<PR6*PN1DC	C1UCR1*|O£*J°£DA	°£DA°1)PD£($F£(G	OOUA°£DA°£DA°£DC	3°"L1£<GT8@PN8@X	O5M°°89U40420035
T+/<W6?PQ1DCR1)L	O9*N°9_XA54CC5_P	N1*|T5_V°O)PD£<|	O5)PEO=(°@"¬4@MC	CO*.LI:1.£DC15:.	E6;<°@9°40420036
T+/(/£<E°8%|RO:|	C2DCD2:.K1:|T1MA	°£DA°5_V°8@TE£<V	/5UCA1<GP8@PR£+$	RO))°1<XA1°PO8>|	IO4°°=040420037
T+/+*£DA°£<LI8_.	E8=|EĒ4CPC)N°@?L	6=¬L6@D_°£DA°£DA	°£DA°£DA°£DA*£+|	H1MC3:"L1£+.H5>L	L1D°°ME%40420038
T+/|P1<XS5*|A:DC	H1(X1£<LI8_¬LO:/	.£DC3:"L1£+.H5>L	L1DCD2:.P4@GYE<T	D6¬E°1<XS5*|A:DA	°£D°°0H<40420039
T+/£K£DA°2*R°OMC	SO*XA8@|H£<LI8_.	E@=|E£<XS£+LS1*J	.£<E°1<GTOMA°8%P	T£+$I8@/ @¬.86<.	Y8@M°$QU40420040
T+/J(£(XEO*$R1+I°	O)PD£+|W5UCO6MA°	£(LO6*N°O:PA2)|	AO_|E£+|RC*|K8UC	M9+.T£<.E£<$O9(P	D£<H°£H%40420041
T+/KH:DCD1)¬R1:.	S2)PG£FCR1*(°O*L	VGD_°£DA°£DA°£DA	°£DA°£DA°£DA*PE1	*PE1*PE1*PE1*PE1	*PEC°4DC40420042

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/LCPE1*PE1*PE1	*PE1*PE1*PE1*PE1	*2*R OMCS0'XA8@|	H&<LI8_.E8=|E&+$	A8UCU8%PDE4CD1)¬	R1;H 9R&4C420043
T+/L=8WCR1*(0*L	VQDCU5;|I44CS0)L	E&<LA8@E 8%PT&<G	S&<.E1_$R1*XS&<$	O9(PDK4A &DA &DA	&D E0440420044
T+/M9&DA &DA &DA	&DA &DA &DA &DA	-5;LM&+.H2*$TQDA	8=TP1MC4@MA &DA	&DA &DA &DA &DA	&D @R&40420045
T+/N4Q<$U5*|T&+.	E44CU5'¬E6QA &FC	I5)¬U86A &DA &DA	&DA &DA Q<$U5*|	T&+.E44CU5'¬E6QA	&F 'H@40420046
T+/O?5>LT5=LTQDA	&DA &DA &DA &+$	H1)N 8%PT&+LF&<X	S&<|O5(¬L1;|EE4A	&DA &DA &DA &DA	&(U " M40420047
T+/PD1;.E84CS:+.	T1)J/@4CM0)|TK4A	&DA &DA &DA &DA	&DA &DC5@UCR1*|	D6*LS&+$I4*(0%N	9_U :#040420048
T+/QV2;|T1)N 8'R	@"¬4@MA &DA '¬I	6*PC5_XD8UCW2)|	L&<.E&(XE0*J 0)P	D&<|O5(¬A6*PD&DA	&+H &A040420049
T+/R-1;(9() @"¬	4@MLT5UCR1*GD&($	R&+$R2;|EK4A 9%T	E5MCF'UCH0)|T&<X	S&(XE8%PTE4CS:+.	T1)& 9#&40420050
T+/E$&|(9%XL44C	R1*GD&($R&DA &+$	R2;|E&($N1MCR1*|	O6*J.&DA &DA &DA	&DA &DA &DA &DA	&D 3J-40420051
T+/$O5_PE&(XE0'$	R1DCW0;I 6*PA1D_	&(XE0'$R1DCI8UC	P6*XN8@PD&|I 8&X	M1;I.&DCO5*|E&<X	N&(* ¬ZY40420052
T+/*J6*XN8@GB4@N	1*.C1<XCE4A &DC	O5*|E&<XN&<TE94_	&DA &DA &DA &DA	&DA &DA &DA &DA	&D MYH40420053
T+/)<&($N1MCF1*|	O6*J 9%GS&+$R2;|	T1)N.&DCD0;|A&+L	S1*J 1_$R&+$K2;|	E&+$A8UCS:)LE&<G	S&(* PCH40420054
T+/;G6*PV2)$U8_|	Y&(XE0*J.&DA &DA	Q<XN8@PR6;LP84C	P1)P&2)PGQDCB2;(	1<XD&(P084CC5_L	E&(Q N/<40420055
T+/¬B5MCI5;|E6)X	U5=(4@PV1)('MC	D2*J 5)$T&($C0=L	R&<GF8@PR&|) 8%P	C&_PD8U_ SDA &DA	&D POU40420056
T+/¬'&DA &DA &DA	&DA &DA &DA &DA	&||7'|E 8%PT&+L	P&<XM5'XO5@PR4=/	.&DA &DA &+¬X9=)	5(Q 9/Y40420057
T+/-81<N 1;¬P1*|	T1*J 5_N.&DA &DA	&DA &DA &DA &DA	&DA &(XE0*J 5($	D1MCF5>LN1DCO5M_	&D LJ*40420058
T+//3&DA &DA &DA	&DA &DA &DA 9_X	I&@N 5($D1MCF5>L	N1DCO5M_ &DA &DA	&DA &DA &DA &DA	&+H JI@40420059
T+/S>2)R 5)R-5_)	.&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA 1<GTQMC	T6*GN8%$E6MCR1*¬	I8>< 8,U40420060
T+/TZ1)V 5@GR2;|	Y&<PR6)$R&DA &<.	O8@/ 6*PA1DCA5*J	9_XI8@N 5($D1MC	W1)XE6($NK4A &DA	&D &1%40420061
T+/UU4@PN1=|H&<|	O9(PT&(XE1@XS8@P	R&<PR&)$RK4CE9'¬	E0=|E1DA 1%R,&<$	O9(PD&+¬X0'$M5@G	R1M :. 40420062
T+/V¬1)XR5_V.&DA	&DCR1*|O&*J 5;L	MC%PR&DA &+¬X9=L	N1;¬P1*|T1*J 2)F	T1)XR9(¬TK4A &DA	&D 1$M40420063
T+/WE&DA &DA &DA	&DA Q<PN1DCO1UC	J5%I-&(|I5*N 5)$	T&<GC8@XV1MCA1>|	E6MA &DA 6*PA1<X	N14 &S-40420064

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/XN0)|L&(XE0'$	R1+I 5%R 1<GT0MC	S1;(.&DA &DA &DC	R1*GD&(LO1<N 0)P	D&+$R2;|E&(LO1<N	0_Q Q.04C420065
T+/Y&9@/ 5%$FK4A	&DA 1;¬P1*|T1*J	1*XT2<PR&(XE0*J	S_V 9_XI8@N 5($	D1M_ &DA @"¬4@MC	B9+H OE@40420066
T+/Z.:DCT5_R 4'$	N14_ &DA &DA &DA	&DA &DA &DA &<L	A8&E 5'XE9*XO9+.	L:DCW6*XT8@PN&+$	A8U 6C 40420067
T+/DF&DA &DA &DA	&DA 1<GT0MCR1*G	D&<.A0'I 9%GS&DA	&DA &CA &DA &DA	&DA &DA &E1-PFA	*QE0 :.M40420068
T+/.A&DA 8@TE&+$	R0)) 0'$N5*PC8'$	R&<XS&+.T2)|L&DC	I&:.TC)|L1*J.&DC	F5_|L5>R 1<XR1*|	T2)C Q C40420069
T+/.@5;I.&DA &DA	&DA &||7'|E 2;I	E)$T&($N&(|I5*N	&DA &DA &DA &DA	&DA &DA &DA 1+L	R2)M *JU40420070
T+/%714CR1*GD&<$	R5_J @"¬4@MCT5UC	S:+.T1)J @4_ &DA	&<LU6*XN14CW6*X	T1MCT5UC3'"L1&<$	R5_& 78&40420071
T+/_2&+.Y8>|E5DC	3K4A Q<PN1DCO1UC	R1*|O6*J-&(|I5*N	5)$T&<GC8@XV1MC	A1>|E6MA 8'XAE:.	F1)U 6SY40420072
T+/>_&($F&<E @¬.	8&<.Y8@N 6*PC5_X	DK4A &DA &DA &DA	&(PO8@N-&DCT2<X	S&<PR6)$R&<|A5MC	B1M JZD40420073
T+/?Y0@GU8%PD&<.	Y&DA 9+.I5*) JMC	3'"L1&<LA8@E 8%P	T&+$H5>.E&(XE0'$	R1+I 0)XE&(PO84C	1@?- N8M40420074
T+/0T&<.Y8@PS&<X	N&(|E5*¬T2D_ &DA	&DA &DA &DA &DA	&DA &DA 5($D1MC	E9'¬E0=|E1DCO5M_	&D E#840420075
T+/1:&DA &DA &DA	&DA &DA &DA &DC	R1*GD9_XI8@M	& B C9 EM	AAE A M C	0@| 1-M4C420076
T<12K@|C1@|H |C	0@& G@ D				6T<40420077
E"'"'*E7*=¬DC"PH$	="7M&F| | C	F% ASC R A	S0 Q	07090520750	613752$D40420078

LAST PAGE

EOF1 EOF - 5203 PRINTER SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                 2          DECK  1
   0000                          3 EOF      START 0
   0A00                          4          ORG   X'A00'
                                 5 ***********************************************************************
                                 6 *                          SECTION PREFACE                            *
                                 7 ***********************************************************************
                                 8 *                                                                     *
                                 9 *   THIS AREA CONTAINS INFORMATION NECESSARY FOR SECTION OPERATION.   *
                                10 *   THE PROGRAM IDENTIFICATION, FLAGS, FIRST ROUTINE ADDRESS AND      *
                                11 *   ERROR RECORDING TABLE ADDRESS ARE LOADED BY ASSEMBLED DATA.  THE  *
                                12 *   CURRENT ROUTINE NUMBER IS SUPPLIED BY THE CONTROL PROGRAM.  THE   *
                                13 *   UNIT DEFINITION TABLE, SPUT, IS NOT USED BY THIS SECTION.         *
                                14 *                                                                     *
                                15 ***********************************************************************
   0A00 E0F1             0A01   16 PROGID DC    XL2'E0F1'              PROGRAM IDENTIFICATION
   0A02 00               0A02   17 SPFLGS DC    XL1'0'                 FLAGS
   0A03 01               0A03   18 RNUM   DC    IL1'1'                 CURRENT ROUTINE NUMBER
   0A04 0000             0A05   19        DC    XL2'0'                 NOT USED
   0A06 0A99             0A07   20 FRTN   DC    AL2(RTN01)             ADDRESS OF FIRST ROUTINE PREFIX
   0A08 0A0D             0A09   21 TABADR DC    AL2(ERRTAB)            ADDRESS OF ERROR RECORDING TABLE
                         0A0A   22 SPUDT  EQU   *                      UNIT TABLE
   0A0A E05000           0A0C   23        DC    XL3'E05000'
                                24
                                25 *
                                26 **  ERROR RECORDING TABLE.
                                27 *
   0A0D 80               0A0D   28 ERRTAB DC    XL1'80'
   0A0E 0C               0A0E   29        DC    IL1'12'
   0A0F F5F2F0F340D7D9C9 0A1A   30        DC    CL12'5203 PRINTER'
   0A17 D5E3C5D9                30
   0A1B 80               0A1B   31        DC    XL1'80'
   0A1C 0F               0A1C   32        DC    IL1'15'
   0A1D D3C1E2E340F340C3 0A2B   33        DC    CL15'LAST 3 COMMANDS'
   0A25 D6D4D4C1D5C4E2          33
   0A2C 40               0A2C   34        DC    XL1'40'
   0A2D 02               0A2D   35        DC    IL1'2'
   0A2E 0000             0A2F   36 CMD1   DC    XL2'0'
   0A30 40               0A30   37        DC    XL1'40'
   0A31 02               0A31   38        DC    IL1'2'
   0A32 0000             0A33   39 CMD2   DC    XL2'0'
   0A34 40               0A34   40        DC    XL1'40'
   0A35 02               0A35   41        DC    IL1'2'
   0A36 0000             0A37   42 CMD3   DC    XL2'0'
   0A38 80               0A38   43        DC    XL1'80'
   0A39 0D               0A39   44        DC    IL1'13'
   0A3A D3C1E2E340F340C5 0A46   45        DC    CL13'LAST 3 ERRORS'
   0A42 D9D9D6D9E2              45
                                46
   0A47 80               0A47   47        DC    XL1'80'
   0A48 19               0A48   48        DC    IL1'25'
   0A49 40C3D6D4D4C1D5C4 0A61   49 ECMDS  DC    CL25' COMMANDS  XXXX XXXX XXXX'
   0A51 E24040E7E7E7E740        49
   0A59 E7E7E7E740E7E7E7        49
   0A61 E7                      49
                                50
   0A62 80               0A62   51        DC    XL1'80'
   0A63 19               0A63   52        DC    IL1'25'
   0A64 40C3D240E2E3C1E3 0A7C   53 SNS011 DC    CL25' CK STATUS XXXX XXXX XXXX'
   0A6C E4E240E7E7E7E740        53
   0A74 E7E7E7E740E7E7E7        53
   0A7C E7                      53
                                54
   0A7D 80               0A7D   55        DC    XL1'80'
   0A7E 19               0A7E   56        DC    IL1'25'
   0A7F 40D7D9C9D5E340D7 0A97   57 SNS110 DC    CL25' PRINT POS  XXX  XXX  XXX'
   0A87 D6E24040E7E7E740        57
   0A8F 40E7E7E74040E7E7        57
   0A97 E7                      57
```


EOF1 EOF - 5203 PRINTER SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                58
   0A98 FF               0A98   59        DC    XL1'FF'
```

EOF1 EOF - 5203 PRINTER SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                61 **************************************************************
                                62 *                  ROUTINE 01 - 5203 SYSTEM TEST MODULE      *
                                63 **************************************************************
                                64 *                                                            *
                                65 *   COMMANDS ARE ISSUED TO THE 5203 IN RANDOM ORDER FROM A COMMAND *
                                66 *   TABLE.  SKIPS ARE TO THE NEXT LINE ONLY.                 *
                                67 *                                                            *
                                68 **************************************************************
    0A99 01                0A99 69 RTN01  DC    XL1'01'                  ROUTINE PREFIX
    0A9A 00               -0A9A 70        DC    XL1'0'
    0A9B FFFF              0A9C 71        DC    XL2'FFFF'
                           0A9D 72        USING BEGIN,1
                           0A9D 73        USING BEGIN,2
    0A9D C2 02 0A9D             74 BEGIN  LA    BEGIN,XR2                LOAD BASE REGISTER
    0AA1 3C 40 0DC7             75        MVI   PFIELD+131,C' '          PUT BLANKS IN PRINT AREA
    0AA5 3C 40 0DC6             76        MVI   PFIELD+130,C' '
    0AA9 30 E3 0DC9             77        SNS   PSTAT,X'E3'              STORE PRINTER STATUS
    0AAD 38 04 0DC9             78        TBN   PSTAT,X'04'
    0AB1 F2 90 0F               79        JF    LD120                    BRANCH IF NOT 48 CHARACTER CHAIN
    0AB4 0C 2F 0DC5 082F        80        MVC   PFIELD+129(48),LPIMAG+47   SET UP FOR 48 CHARACTER CHAIN
    0ABA 0C 51 0D95 0DC7        81        MVC   PFIELD+81(82),PFIELD+131
    0AC0 F2 87 0C               82        J     SETPRF
    0AC3 0C 77 0DC5 0877        83 LD120  MVC   PFIELD+129(120),LPIMAG+119 SET UP FOR 120 CHARACTER CHAIN
    0AC9 0C 09 0D4D 0DC7        84        MVC   PFIELD+9(10),PFIELD+131
    0ACF 3C 00 0876             85 SETPRF MVI   LPDATA-1,X'00'           LOAD SYSTEM TEST FLAG INTO PRINT FLD
    0AD3 31 E0 0CDA             86        LIO   N112,X'E0'               LOAD PRINTER LSRS
    0AD7 31 E4 0CDC             87        LIO   X800,X'E4'
    0ADB 31 E6 0CDE             88        LIO   X87C,X'E6'
    0ADF C2 01 0D01             89 FIRSTC LA    CMDTAB-2,XR1             INITIALIZE POINTER TO COMMAND TABLE
    0AE3 34 01 0DCB             90        ST    CMDPTR,XR1
    0AE7 35 01 0DCB             91 LDPTR  L     CMDPTR,XR1               INCREMENT POINTER FOR NEXT COMMAND
    0AEB D2 01 02               92        LA    2(,XR1),XR1
    0AEE 7D 00 00               93        CLI   0(,XR1),X'0'             RE-INITIALIZE IF THIS IS LAST
    0AF1 E0 81 42               94        BE    FIRSTC(,XR2)              COMMAND
    0AF4 34 01 0DCB             95        ST    CMDPTR,XR1
    0AF8 C1 E0 0B0C             96        TIO   LPERR,X'E0'              BRANCH IF ANY PRINTER ERRORS/NOT RDY
    0AFC 30 E3 0DC9             97        SNS   PSTAT,X'E3'              STORE STATUS
    0B00 39 E2 0DC9             98        TBF   PSTAT,X'E2'
    0B04 39 F7 0DC8             99        TBF   PSTAT-1,X'F7'
    0B08 C0 10 0BB2            100        BT    CKBUSY                   BRANCH IF NO ERROR STATUS
    0B0C 30 E3 0DC9            101 LPERR  SNS   PSTAT,X'E3'              STORE STATUS
    0B10 39 E2 0DC9            102        TBF   PSTAT,X'E2'              IF NO CHECK CONDITIONS, GO EXIT
    0B14 39 F7 0DC8            103        TBF   PSTAT-1,X'F7'
    0B18 C0 10 0CC8            104        BT    GOOUT
    0B1C 38 02 0DC9            105        TBN   PSTAT,X'02'              SKIP ERROR HALT IF UNPRINTABLE
    0B20 38 80 0DD6            106        TBN   FLAG,X'80'                CHARACTER ERROR AND HAS ALREADY
    0B24 C0 10 0CC8            107        BT    GOOUT                     BEEN INDICATED
    0B28 3A 80 0DD6            108        SBN   FLAG,X'80'
    0B2C 30 E6 0DD3            109        SNS   PSTAT2,X'E6'             STORE LPDAR
    0B30 0C 03 0A57 0A5C       110        MVC   ECMDS-10(4),ECMDS-5      PUT LAST COMMAND IN PUSHDOWN TABLE
    0B36 0C 03 0A5C 0A61       111        MVC   ECMDS-5(4),ECMDS          OF ERROR COMMANDS
    0B3C C0 87 021E            112        B     UNPACK
    0B40 02               0B40 113        DC    IL1'2'
    0B41 0A37             0B42 114        DC    AL2(CMD3)
    0B43 0A61             0B44 115        DC    AL2(ECMDS)
    0B45 0C 03 0A72 0A77       116        MVC   SNS011-10(4),SNS011-5 PUT CHECK STATUS IN PUSHDOWN TABLE
    0B4B 0C 03 0A77 0A7C       117        MVC   SNS011-5(4),SNS011
    0B51 C0 87 021E            118        B     UNPACK                   PUT STATUS IN ERROR TABLE
    0B55 02               0B55 119        DC    IL1'2'
    0B56 0DC9             0B57 120        DC    AL2(PSTAT)
    0B58 0A7C             0B59 121        DC    AL2(SNS011)
    0B5A 0C 02 0A8D 0A92       122        MVC   SNS110-10(3),SNS110-5  PUT PRINT POSITION IN TABLE
    0B60 0C 02 0A92 0A97       123        MVC   SNS110-5(3),SNS110
    0B66 0F 00 0DD3 0CE1       124        SLC   PSTAT2(1),X78
    0B6C 04 20 0A97 0CD7       125        ZAZ   SNS110(3),DZERO(1)
    0B72 06 20 0A97 0CD8       126 PPLOOP AZ    SNS110(3),DONE(1)
    0B78 0F 00 0DD3 0CD4       127        SLC   PSTAT2(1),ONE
    0B7E C0 01 0B72            128        BNZ   PPLOOP
```


EOF1 EOF - 5203 PRINTER SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               129 *
                               130 **  THE FOLLOWING CODING DETERMINES WHICH FAILURE HAS OCCURRED AND
                               131 **  SETS UP THE PROPER HALT CODE.
                               132 **
                               133 **      04 - CHAIN SYNC CHECK.
                               134 **      05 - INCREMENTER SYNC OR SLIP CHECK.
                               135 **      06 - INCREMENTER FAILURE CHECK.
                               136 **      09 - HAMMER ECHO CHECK.
                               137 **      0A - ANY HAMMER ON CHECK.
                               138 **      07 - THERMAL CHECK.
                               139 **      01 - CARRIAGE SYNC CHECK.
                               140 **      02 - CARRIAGE SPACE CHECK.
                               141 **      03 - FORMS CHECK JAM.
                               142 **      08 - NO OP STATUS BIT SET WITH NO OTHER ERROR.
                               143 **      0C - UNPRINTABLE CHARACTER SKIPPED.
                               144 *
    0B82 C2 01 0CDF            145        LA    SNSTAB-3,XR1             POINT AT TABLE OF SENSE /HALT INFO
    0B86 D2 01 03              146 SNSLP  LA    3(,XR1),XR1              INCREMENT TO NEXT ENTRY
    0B89 1C 00 0894 00         147        MVC   CHECK1+1(1),0(,XR1)      MOVE MASK TO CHECK NEXT ERROR BIT
    0B8E 1C 00 0898 01         148        MVC   CHECK2+1(1),1(,XR1)
    0B93 39 00 0DC8            149 CHECK1 TBF   PSTAT-1,*-*              CHECK TO SEE IF THIS IS ERROR BIT
    0B97 39 00 0DC9            150 CHECK2 TBF   PSTAT,*-*                 DETECTED
    0B9B C0 10 0B86            151        BT    SNSLP                    CONTINUE IF NOT
    0B9F 1C 00 0BA9 02         152        MVC   PHALT(1),2(,XR1)         FOUND IT - SET UP HALT
    0BA4 C0 87 0222            153 DOHALT B     HALT                     ERROR HALT
    0BA8 E000             0BA9 154 PHALT  DC    XL2'E000'
    0BAA 3C 00 0878            155        MVI   LPDATA-1,X'0'
    0BAE C0 87 0CC8            156        B     GOOUT                    EXIT MODULE
    0BB2 C1 E6 0BB9            157 CKBUSY TIO   ISBUSY,X'E6'             BRANCH IF PRINTER BUSY
    0BB6 F2 87 14              158        J     CKCARR                   GO ISSUE COMMAND IF NOT BUSY
    0BB9 0F 01 0DD5 0CD4       159 ISBUSY SLC   TIMOUT(2),ONE            GO BACK TO SUPERVISOR IF NO TIMEOUT
    0BBF C0 01 0CC8            160        BNZ   GOOUT
    0BC3 C0 87 0222            161        B     HALT                    *BUSY TOO LONG
    0BC7 E014             0BC8 162        DC    XL2'E014'
    0BC9 C0 87 0CC8            163        B     GOOUT                    EXIT SUBROUTINE
    0BCD 38 80 0209            164 CKCARR TBN   SBYTE1,SSW08             SET UP TO CHECK LEFT OR RIGHT CARR.
    0BD1 F2 90 07              165        JF    SLEFT                     LINE COUNTER DEPENDING ON SSW08
    0BD4 30 E0 0DCD            166        SNS   LCIS,X'E0'                --RIGHT CARRIAGE
    0BD8 F2 87 04              167        J     CKDCP
    0BDB 30 E0 0DCE            168 SLEFT  SNS   LCIS+1,X'E0'              --LEFT CARRIAGE
    0BDF 3D FF 0878            169 CKDCP  CLI   LPDATA-1,X'FF'           BRANCH IF DCP DID NOT PRINT
    0BE3 F2 81 0A              170        JE    CKLINE
    0BE6 0C 00 0DCF 0DCD       171        MVC   LCSB(1),LCIS             NO OP LINE COUNTER CHECK
    0BEC 3C FF 0878            172        MVI   LPDATA-1,X'FF'
    0BF0 0D 00 0DCD 0DCF       173 CKLINE CLC   LCIS(1),LCSB             CHECK LINE COUNTER
    0BF6 F2 81 50              174        JE    LDCMD
    0BF9 04 20 0D35 0CD7       175        ZAZ   LCERR-13(3),DZERO(1)
    0BFF 04 20 0D41 0CD7       176        ZAZ   LCERR-1(3),DZERO(1)
    0C05 0C 00 0DD1 0DCD       177        MVC   WORK(1),LCIS             SET UP ACTUAL LINE COUNTER
    0C0B 06 20 0D35 0CD8       178 ISLOOP AZ    LCERR-13(3),DONE(1)
    0C11 0F 00 0DD1 0CD4       179        SLC   WORK(1),ONE
    0C17 C0 01 0C0B            180        BNZ   ISLOOP
    0C1B 0C 00 0DD1 0DCF       181        MVC   WORK(1),LCSB             SET UP EXPECTED LINE COUNTER
    0C21 06 20 0D41 0CD8       182 SBLOOP AZ    LCERR-1(3),DONE(1)
    0C27 0F 00 0DD1 0CD4       163        SLC   WORK(1),ONE
    0C2D C0 01 0C21            184        BNZ   SBLOOP
    0C31 C0 87 021A            185        B     PRINT                    PRINT LINE COUNTER ERROR
    0C35 C5               0C35 186        DC    XL1'C5'                   MESSAGE
    0C36 27               0C36 187        DC    IL1'39'
    0C37 0D42             0C38 188        DC    AL2(LCERR)
    0C39 E033             0C3A 189        DC    XL2'E033'
    0C3B C0 87 0222            190        B     HALT                     HALT ON ERROR
    0C3F E033             0C40 191        DC    XL2'E033'
    0C41 3C 00 0878            192        MVI   LPDATA-1,X'0'            SET UP TO SKIP NEXT LINE CTR CHECK
    0C45 C0 87 0BB2            193        B     CKBUSY
    0C49 35 01 0DCB            194 LDCMD  L     CMDPTR,XR1               LOAD POINTER FOR THIS COMMAND
    0C4D 1C 01 0CC1 01         195        MVC   STRTIO+2(2),1(,XR1)      MOVE INTO COMMAND
    0C52 78 02 00              196        TBN   0(,XR1),X'02'            BRANCH IF NO PRINT
```

EOF1 EOF - 5203 PRINTER SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    0C55 F2 90 12                197        JF    CKSKIP
    0C58 0C 00 0D43 0DC7         198        MVC   PFIELD-1(1),PFIELD+131     RIPPLE PRINT FIELD
    0C5E 0C 83 0DC7 0DC6         199        MVC   PFIELD+131(132),PFIELD+130
    0C64 0C 83 08FF 0DC7         200        MVC   LPDATA+131(132),PFIELD+131 MOVE TO PRINTOUT AREA
    0C6A 7D FF 01                201 CKSKIP CLI   1(,XR1),X'FF'          BRANCH IF NOT SKIP TO NEXT LINE
    0C6D F2 01 1B                202        JNE   SETLC
    0C70 0E 00 0DCF 0CD4         203        ALC   LCSB(1),ONE
    0C76 0C 00 0CC1 0DCF         204        MVC   STRTIO+2(1),LCSB       SET UP TO SKIP TO NEXT LINE
    0C7C 3D 70 0CC1              205        CLI   STRTIO+2,112           IS WE OVERFLOW LENGTH, SET UP
    0C80 F2 04 1B                206        JNH   LDETAB                  TO GO TO LINE 1
    0C83 3C 01 0CC1              207        MVI   STRTIO+2,1
    0C87 3C 00 0DCF              208        MVI   LCSB,0
    0C8B 0E 00 0DCF 0CC1         209 SETLC  ALC   LCSB(1),STRTIO+2       SET UP EXPECTED LINE COUNTER TO WHAT
    0C91 3D 70 0DCF              210 CK112  CLI   LCSB,112                IT SHOULD BE AFTER THIS COMMAND
    0C95 F2 04 06                211        JNH   LDETAB
    0C98 0F 00 0DCF 0C92         212        SLC   LCSB(1),CK112+1        TAKE CARE OF CROSSING LINE 112
    0C9E 38 80 0209              213 LDETAB TBN   SBYTE1,SSW08           PRINT USING RIGHT CARRIAGE IF SSW08
    0CA2 F2 90 04                214        JF    *+7                     IS ON
    0CA5 3A 08 0CC0              215        SBN   STRTIO+1,X'08'
    0CA9 3B 80 0DD6              216        SBF   FLAG,X'80'             TURN OFF UPC FLAG
    0CAD 0C 01 0A2F 0A33         217        MVC   CMD1(2),CMD2           PUT THIS COMMAND IN PUSH-DOWN TABLE
    0CB3 0C 01 0A33 0A37         218        MVC   CMD2(2),CMD3
    0CB9 0C 01 0A37 0CC1         219        MVC   CMD3(2),STRTIO+2
    0CBF F3 00 00                220 STRTIO SIO   *-*,*-*                 DO COMMAND
    0CC2 0C 01 0DD5 0CE0         221        MVC   TIMOUT(2),TIME         SET UP BUSY TIMEOUT
    0CC8 3D E0 0A00              222 GOOUT  CLI   X'A00',X'E0'           CHECK TO SEE IF SECTION RELOCATED
    0CCC C0 01 0A0A              223        BNE   ENTRY                   YES, GO TO SYSTEM TEST SUPERVISOR
    0CD0 E0 87 4A                224        B     LDPTR(,XR2)             NO, REMAIN IN TEST
                                 225
                                 226 *************
                                 227 * CONSTANTS ***************************************************************
                                 228 *************
    0CD3 0001          0CD4      229 ONE    DC    IL2'1'
    0CD5 0002          0CD6      230 TWO    DC    IL2'2'
    0CD7 F0            0CD7      231 DZERO  DC    DL1'0'
    0CD8 F1            0CD8      232 DONE   DC    DL1'1'
    0CD9 7070          0CDA      233 N112   DC    XL2'7070'
    0CDB 0800          0CDC      234 X800   DC    XL2'800'
    0CDD 087C          0CDE      235 X87C   DC    XL2'87C'
    0CDF 1770          0CE0      236 TIME   DC    IL2'6000'
    0CE1 7B            0CE1      237 X7B    DC    XL1'7B'
                       0CE2      238 SNSTAB EQU   *                      TABLE OF ERROR STATUS/HALTS
    0CE2 0080040040051000 0CF6   239        DC    XL21'00800400400510000604000902000A002007800001'
    0CEA 0604000902000A00        239
    0CF2 2007800001              239
    0CF7 4000022000030100 0D02   240        DC    XL12'40000220000301000800020C'
    0CFF 0800020C                240
                                 241 *
                                 242 **  TABLE OF COMMANDS.
                                 243 *
                       0D03      244 CMDTAB EQU   *
    0D03 E201          0D04      245        DC    XL2'E201'              PRINT & SPACE 1
    0D05 E202          0D06      246        DC    XL2'E202'              PRINT & SPACE 2
    0D07 E201          0D08      247        DC    XL2'E201'
    0D09 E203          0D0A      248        DC    XL2'E203'              PRINT & SPACE 3
    0D0B E201          0D0C      249        DC    XL2'E201'
    0D0D E000          0D0E      250        DC    XL2'E000'              SPACE 0
    0D0F E201          0D10      251        DC    XL2'E201'
    0D11 E001          0D12      252        DC    XL2'E001'              SPACE 1
    0D13 E201          0D14      253        DC    XL2'E201'
    0D15 E6FF          0D16      254        DC    XL2'E6FF'              PRINT & SKIP TO LINE XX
    0D17 E201          0D18      255        DC    XL2'E201'
    0D19 E4FF          0D1A      256        DC    XL2'E4FF'              SKIP TO LINE XX
    0D1B 00            0D1B      257        DC    XL1'0'
                                 258
                                 259 *************
                                 260 * PRINTOUTS ***************************************************************
                                 261 *************
```


EOF1 EOF - 5203 PRINTER SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    0D1C D3C9D5C540C3D6E4 0D42   262 LCERR  DC    CL39'LINE COUNTER ERROR. IS XXX. SHD BE XXX.'
    0D24 D5E3C5D940C5D9D9        262
    0D2C D6D94B40C9E240E7        262
    0D34 E7E74B40E2C8C440        262
    0D3C C2C540E7E7E748          262
                                 263
                                 264 *******************
                                 265 * RESERVED STORAGE ***********************************************************
                                 266 *******************
    0D43                 0D43    267        DS    CL1                    DUMMY BYTE FOR RIPPLE
                         0D44    268 PFIELD EQU   *                      PRINTER WORK FIELD
    0D44                 0DC7    269        DS    CL132
    0DC8                 0DC9    270 PSTAT  DS    CL2                    PRINTER STATUS
    0DCA                 0DCB    271 CMDPTR DS    CL2                    COMMAND TABLE POINTER
    0DCC                 0DCD    272 LCIS   DS    CL2                    ACTUAL LINE COUNTER
    0DCE                 0DCE    273        DS    CL1
    0DCF                 0DCF    274 LCSB   DS    CL1                    EXPECTED LINE COUNTER
    0DD0                 0DD1    275 WORK   DS    CL2
    0DD2                 0DD3    276 PSTAT2 DS    CL2
    0DD4                 0DD5    277 TIMOUT DS    CL2
    0DD6                 0DD6    278 FLAG   DS    CL1
                                 279
                                 280 ***********
                                 281 * EQUATES ****************************************************************
                                 282 ***********
                         0010    283 IAR    EQU   X'10'                  INSTRUCTION ADDRESS REGISTER
                         0008    284 ARR    EQU   X'08'                  ADDRESS RECALL REGISTER
                         0001    285 XR1    EQU   X'01'                  INDEX REGISTER 1
                         0002    286 XR2    EQU   X'02'                  INDEX REGISTER 2
                                 287
                         0208    288 SBYTE0 EQU   X'208'                 FIRST BYTE OF COMMON SENSE SWITCHES
                         0209    289 SBYTE1 EQU   X'209'                 SECOND BYTE OF COMMON SENSE SWITCHES
                         020A    290 SBYTE2 EQU   X'20A'                 FIRST BYTE OF SECTION SSWS
                         0208    291 SBYTE4 EQU   X'208'                 SECOND BYTE OF SECTION SSWS
                         0212    292 TEST   EQU   X'212'                 SRT - ENTRY TO CHECK CONSOLE SWS
                         0216    293 LINK   EQU   X'216'                     - ENTRY TO CHAIN ROUTINE
                         021A    294 PRINT  EQU   X'21A'                     - ENTRY TO PRINT
                         021E    295 UNPACK EQU   X'21E'                     - ENTRY TO CONVERT HEX TO EBCDIC
                         0222    296 HALT   EQU   X'222'                     - ENTRY TO HALT
                         0226    297 PACK   EQU   X'226'                     - ENTRY TO PACK EBCDIC TO HEX
                         0232    298 UTAB   EQU   X'232'                     - DCP UNIT TABLE
                         0800    299 LPIMAG EQU   X'800'                 FIRST BYTE OF 5203 PRINT IMAGE FIELD
                         087C    300 LPDATA EQU   X'87C'                 FIRST BYTE OF 5203 PRINT DATA FIELD
                                 301
                                 302 *
                                 303 ** SENSE SWITCHES.
                                 304 *
                         0004    305 SSW05  EQU   X'04'                  PRINT ON MFCU
                         0080    306 SSW08  EQU   X'80'                  USE 5203 RIGHT CARRIAGE
                                 307
                         0A0A    308 ENTRY  EQU   X'A0A'                 MULTIPROGRAMMING ENTRY
                         0A9D    309        END   BEGIN
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ARR	C	001	0008	0284	
BEGIN	A	004	0A9D	0074	0072 0073 0074 0309
CHECK1	A	004	0B93	0149	0147*
CHECK2	A	004	0B97	0150	0148*
CKBUSY	A	004	0BB2	0157	0100 0193
CKCARR	A	004	0BCD	0164	0158
CKDCP	A	004	0BDF	0169	0167
CKLINE	A	006	0BF0	0173	0170
CKSKIP	A	003	0C6A	0201	0197
CK112	A	004	0C91	0210	0212
CMDPTR	A	002	0DCB	0271	0090* 0091 0095* 0194
CMDTAB	A	001	0D03	0244	0089
CMD1	A	002	0A2F	0036	0217*
CMD2	A	002	0A33	0039	0217 0218*
CMD3	A	002	0A37	0042	0114 0218 0219*
DOHALT	A	004	0BA4	0153	
DONE	A	001	0CD8	0232	0126 0178 0182
DZERO	A	001	0CD7	0231	0125 0175 0176
ECMDS	A	025	0A61	0049	0110 0110* 0111 0111* 0115
ENTRY	C	001	0A0A	0308	0223
ERRTAB	A	001	0A0D	0028	0021
EOF	A	001	0000	0003	
FIRSTC	A	004	0ADF	0089	0094
FLAG	A	001	0DD6	0278	0106 0108* 0216*
FRTN	A	002	0A07	0020	
GOOUT	A	004	0CC8	0222	0104 0107 0156 0160 0163
HALT	C	001	0222	0296	0153 0161 0190
IAR	C	001	0010	0283	
ISBUSY	A	006	0BB9	0159	0157
ISLOOP	A	006	0C0B	0178	0180
LCERR	A	039	0D42	0262	0175* 0176* 0178* 0182* 0188
LCIS	A	002	0DCD	0272	0166* 0168* 0171 0173 0177
LCSB	A	001	0DCF	0274	0171* 0173 0181 0203* 0204 0208* 0209* 0210 0212*
LDCMD	A	004	0C49	0194	0174
LDETAB	A	004	0C9E	0213	0206 0211
LDPTR	A	004	0AE7	0091	0224
LD120	A	006	0AC3	0083	0079
LINK	C	001	0216	0293	
LPDATA	C	001	087C	0300	0085* 0155* 0169 0172* 0192* 0200*
LPERR	A	004	0B0C	0101	0096
LPIMAG	C	001	0800	0299	0080 0083
N112	A	002	0CDA	0233	0086
ONE	A	002	0CD4	0229	0127 0159 0179 0183 0203
PACK	C	001	0226	0297	
PFIELD	A	001	0D44	0268	0075* 0076* 0080* 0081 0081* 0083* 0084 0084* 0198 0198* 0199 0199* 0200
PHALT	A	002	0BA9	0154	0152*
PPLOOP	A	006	0B72	0126	0128
PRINT	C	001	021A	0294	0185
PROGID	A	002	0A01	0016	
PSTAT	A	002	0DC9	0270	0077* 0078 0097* 0098 0099 0101* 0102 0103 0105 0120 0149 0150
PSTAT2	A	002	0DD3	0276	0109* 0124* 0127*
RNUM	A	001	0A03	0018	
RTN01	A	001	0A99	0069	0020
SBLOOP	A	006	0C21	0182	0184
SBYTE0	C	001	0208	0288	
SBYTE1	C	001	0209	0289	0164 0213
SBYTE2	C	001	020A	0290	
SBYTE4	C	001	020B	0291	
SETLC	A	006	0C8B	0209	0202
SETPRF	A	004	CACF	0085	0082
SLEFT	A	004	0BD3	0168	0165
SNSLP	A	003	0B86	0146	0151
SNSTAB	A	001	0CE2	0238	0145
SNS011	A	025	0A7C	0053	0116 0116* 0117 0117* 0121
SNS110	A	025	0A97	0057	0122 0122* 0123 0123* 0125* 0126*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SPFLGS	A	001	0A02	0017	
SPUDT	A	001	0A0A	0022	
SSW05	C	001	0004	0305	
SSW08	C	001	0080	0306	0164 0213
STRTIO	A	003	0CBF	0220	0195* 0204* 0205 0207* 0209 0215* 0219
TABADR	A	002	0A09	0021	
TEST	C	001	0212	0292	
TIME	A	002	0CE0	0236	0221
TIMOUT	A	002	0DD5	0277	0159* 0221*
TWO	A	002	0CD6	0230	
UNPACK	C	001	021E	0295	0112 0118
UTAB	C	001	0232	0298	
WORK	A	002	0DD1	0275	0177* 0179* 0181* 0183*
XR1	C	001	0001	0285	0089* 0090 0091* 0092 0092* 0093 0095 0145* 0146 0146* 0147 0148 0152 0194* 0195 0196 0201
XR2	C	001	0002	0286	0074* 0094 0224
X7B	A	001	0CE1	0237	0124
X800	A	002	0CDC	0234	0087
X87C	A	002	0CDE	0235	0088

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

THE CHARACTER ° INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

SB@PO1UA &°°°°°7 P°°°°°°°°°°°°°°  °°°°°°°°°°°°°°°  °°°°°°°°°°°°°°°  °°°°°°°°°°°°°°°  °°°°°
                                                                                          PYHEOF10001
T+°Y88|D°°&°BZU  H̄C;A&°H<°.0@4C  P6*XN8@PR-°"LO;.  T&|{°0'$M5<GN1+I  °°-°°&°H°D°B°B  °°°UG*H̄GEOF10002
T+-Z3C)|A8>(°@4C  E6)XO6;H̄°FMCC5_L  MO}PD8UA°9=¬X94C  X9=¬X&+¬X9=;°FMC  C4UCS8@GT9+I°9=¬  X94°°7O<EOF10003
T(-DD̄9=¬X94CX9=¬  X-AV°5'XI5;(°5'$  S&DCX9=)°&+¬X94A  °9=¬X"OD°"""B°-D̄  )|D°(131°C*QO8O°  °(C°%5O@EOF10004
T<°,$C*U8A°7I@Z°  |CB@(1&-?CED(V&7  G@Y*<CG*(1&/7C°U  (L&7G|°°H;3G-C(Y  19°3*<&°?H̄2</F1&  KC°MA;KMEOF10005
T<°%<9-3;O-D(°L&  AC*%5°&7.4-DB¬&°  °8HEB(°D(2@G-8OO  O8O7I+;H(2LX7C*T  °D°>2<°°?H̄2*TG1%  +B-QB)L°EOF10006
T.°%9807I+;H(2LX  7C*T°D°3H+°H(2LS  °C)$°D°3H+Y°(5TC  WC)<<°OZPBVO<°OZ  *°°°°.B-WH/8ĒE/H  +B-QB2JYEOF10007
T.&_XBWG°/OH;°-Y  7BWD<°OZ2BX*<°OZ  7BX3°/OH;°-7IBXO  <°-D̄(8ZH<°-D̄K8Z*  |°°°,H̄KMTG14OEA°  +B—AK.°EOF10008
T.°>MC)<<8&&-BZ*  <5OQ-BZ*<6°@°C)<  <5<°AB7.B°&3¬4-D  CG°°.V°°*°°>Q°LU  °°°°°H̄K&)FJMLCO4  IAO<ADQ*EOF10009
T<&?FC*-9°°7IOA°  .//O°B:UBOH*BH>°  °|°°H;@BGC<TA9->  9@Y*MCOD(5&3MO°D  <2<BG°SH°.KUXHAO  (B&MA&14EOF10010
T<O?:8AL°/O3H+H°  BB¬H̄&A3C-C*72/O&  O8°7+|¬@H;"HAB-O  °C*@(3L3"BG%(°°7  (C*"2-N°DH°°>.B&  SE1°EMS4EOF10011
H̄OOWCLM<5O&-CMD  <5OO°C)D(3&Q-CLM  <6°@°C)D<5<°AC°%  <°°7JC*@FH°5AC(-  °H̄2UVH1@$FJMLCO4  IAO<A38DEOF10012
T<-1RCO°(4&3MO°D  <H*BG°/,EIO5B8C|  °/OHS8C<@°°/#OH*  .%TMAC*%*°&3A°P-  B°|H̄&D-O°°°°ZIKD  JB&MCNZ&EOF10013
T.-2HCM<(1O2CC**  (1-2CB|@(177"¬H  AF08°C*@<5°O°C<D  (3350C<G2AA%@°&3  A|°°°°BOVHJ@$F&@  IAO<A*C@EOF10014
T.&26C*@+°°7|C<D  °*°7|@-&FCO°(3O2  K+H°BB¬H̄&ACYHC<°  #-°7OC°DH̄.OY3C°D  H̄<O°°°B4ZI2<¬EAH  .AOMA¬HYEOF10015
T(&3%BT*<°&Y7C<G  3°°°<°&7NC+°'8°Y  °O°DH̄B>BGK-°A°°.  O@PAOB°°H¬A)O;OB  °A°A°AJ°°A-&°°A°  +AOMA&:QEOF10016
T+-4XB&H°B-°-A8°  °°M°°°S°°°OD°Ē°°  &C+HA8-.S°;HC8-G  -°+HAB°GS°;$"8-G  U"OCL2)PE&<|O9(P  T1)U°&IHEOF10017
TF-5B&<PR6)$RK4C  I8UCX9=).&+.H1DC  B1MCX9=).°°°°°°°  °°°°°°°°°°°°°°°  °°°°°°°°°°°°°°°  °°°°°
                                                                                          72DEOF10018
EBZ5*E7*=¬DC"PH$  ="7N&F|°°°|°C°°F%°°°ASC°°°R°A  SO°°°Q°°°°°°°°°°  °°°°°°°°°
                                                                    1011690  1267008QEOF10019
```

LAST PAGE

E013 5203 LINE PRINTER FUNCTION TESTS

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           2        DECK 4
 0A00                      3 E013   START X'A00'
                           4 ********************************************************************
                           5 *                          SECTION PREFACE                         *
                           6 ********************************************************************
                           7 *   THIS AREA CONTAINS INFORMATION NECESSARY FOR SECTION OPERATION.  *
                           8 *   THE PROGRAM IDENTIFICATION, FLAGS AND FIRST ROUTINE ADDRESS      *
                           9 *   ARE LOADED BY ASSEMBLED DATA. THE CURRENT ROUTINE NUMBER IS      *
                          10 *   SUPPLIED BY THE CONTROL PROGRAM.  SECTION UDT ENTRIES ARE        *
                          11 *   DEFINED PARTIALLY BY THE SECTION SO THAT THE CONTROL PROGRAM     *
                          12 *   CAN SUPPLY OPTION BYTES.                                         *
                          13 ********************************************************************
 0A00 E013          0A01  14         DC    XL2'E013'          PROGRAM IDENTIFICATION
 0A02 00            0A02  15         DC    XL1'0'             FLAGS
 0A03 01            0A03  16 RNUM    DC    XL1'1'             CURRENT ROUTINE NUMBER
 0A04 0000          0A05  17         DC    XL2'0'             RESERVED
 0A06 0A0F          0A07  18         DC    AL2(RTN1)          ADDRESS OF FIRST ROUTINE PREFIX
 0A08 1F91          0A09  19         DC    AL2(ERT1)          ADDRESS OF ERROR RECORDING TABLE
 0A0A E05000        0A0C  20 SPUDT   DC    XL3'E05000'        UNIT DEFINITION TABLE - PRINTER
                          21 ********************************************************************
                          22 *                                                                  *
                          23 *      ROUTINE 1 - SENSE COMMAND TO PRINTER                        *
                          24 *                  (RESTORE CARRIAGE(S) BEFORE EXECUTING)          *
                          25 *                                                                  *
                          26 ********************************************************************
 0A0D 0101          0A0E  27 EXP12   DC    XL2'0101'
                          28
 0A0F 01            0A0F  29 RTN1    DC    XL1'1'             ROUTINE NUMBER
 0A10 00            0A10  30         DC    XL1'0'             FLAGS
 0A11 0A93          0A12  31         DC    AL2(RTN2)          ADDRESS OF NEXT ROUTINE PREFIX
                          32 ********************************************************************
 0A13 38 01 0A0C           33         TBN   SPUDT,B'1'         DUAL FEED
 0A17 F2 10 04             34         JT    NIGEB
 0A1A 3C 00 0A0E           35         MVI   EXP12,X'00'
 0A1E 30 E0 1F95           36 NIGEB   SNS   STAIX,X'E0'       SENSE FOR CARR.LOC.
 0A22 D0 01 1F95 0A0E      37         CLC   STAIX(2),EXP12     ARE LINE COUNTERS AT LINE 1
 0A28 F2 81 25             38         JE    SPALT              JUMP OVER HALT
 0A2B 38 04 0208           39         TBN   SBYTE0,SSW05        PRINT ON MFCU
 0A2F F2 90 18             40         JF    GRALT
 0A32 C0 87 021A           41         B     PRINT              PRINT 'CMD DECODE ERROR'
 0A36 C1            0A36   42         DC    XL1'C1'
 0A37 10            0A37   43         DC    IL1'16'
 0A38 1B84          0A39   44         DC    AL2(REDDP)
 0A3A E030          0A3B   45         DC    XL2'E030'
 0A3C 0C 01 1BD1 1BD7      46         MVC   MAP(2),CHT13       PUT CHART NO. IN MSG.
 0A42 C0 87 021A           47         B     PRINT              PRINT PROCESSOR CHK.MSG.
 0A46 81            0A46   48         DC    XL1'81'
 0A47 0A            0A47   49         DC    IL1'10'
 0A48 1BD1          0A49   50         DC    AL2(MAP)
 0A4A C0 87 0222           51 GRALT   B     HALT               INVALID 'N' FIELD IN SENSE COMD.
 0A4E E030          0A4F   52         DC    XL2'E030'
 0A50 C1 E2 0A54           53 SPALT   TIO   JEXT,PBBUSY
 0A54 3D FF 0878           54 JEXT    CLI   UCSFLG,X'FF'       120 CHAR.IMAG
 0A58 F2 01 04             55         JNE   SESTAT
 0A5B 3C 39 0A63           56         MVI   TECHBI,X'39'       SET TEST FOR BIT OFF
 0A5F 30 E3 1F93           57 SESTAT  SNS   STAT6,X'E3'        SENSE STATUS BYTES
 0A63 38 04 1F93           58 TECHBI  TBN   STAT6,B'100'       TEST 48 CHAR.BIT ON OR OFF
 0A67 F2 10 25             59         JT    OKYDOK
 0A6A 38 04 0208           60         TBN   SBYTE0,SSW05       PRINT ON MFCU
 0A6E F2 90 18             61         JF    HALIT
 0A71 C0 87 021A           62         B     PRINT              PRINT CHAIN CHK.ERR
 0A75 C1            0A75   63         DC    XL1'C1'
 0A76 25            0A76   64         DC    IL1'37'
 0A77 1C9C          0A78   65         DC    AL2(CHACHE)
 0A79 E00E          0A7A   66         DC    XL2'E00E'
 0A7B 0C 01 1BD1 1BDF      67         MVC   MAP(2),CHT19       PUT CHART NO. IN MSG.
 0A81 C0 87 021A           68         B     PRINT              PRINT PRINTER MAP CHART NO.
 0A85 81            0A85   69         DC    XL1'81'
```


E013 5203 LINE PRINTER FUNCTION TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0A86 0A                  0A86  70         DC    IL1'10'
 0A87 1BD1                0A88  71         DC    AL2(MAP)
 0A89 C0 87 0222                72 HALIT   B     HALT
 0A8D E00E                0A8E  73         DC    XL2'E00E'
 0A8F C0 87 0216                74 OKYDOK  B     LINK
                                75
                                76 ********************************************************************
                                77 *                                                                  *
                                78 *      ROUTINE 2 - TIO TO NOT READY DEVICE                         *
                                79 *                  (PRINTER MUST BE NOT READY BEFORE EXECUTING)    *
                                80 *                                                                  *
                                81 ********************************************************************
 0A93 02                  0A93  82 RTN2    DC    XL1'2'             ROUTINE NUMBER
 0A94 80                  0A94  83         DC    XL1'80'            FLAGS - MANUAL INTERVENTION
 0A95 0AE2                0A96  84         DC    AL2(RTN3)          ADDRESS OF NEXT ROUTINE PREFIX
                                85 ********************************************************************
 0A97 C1 E0 0ADE                86         TIO   R1NRDY,NRDY        SHOULD BRANCH ON TEST OF NOT READY
 0A9B 38 04 0208                87         TBN   SBYTE0,SSW05       PRINT ON MFCU
 0A9F F2 90 10                  88         JF    LOARR              JUMP TO SKIP PRINTING
 0AA2 0C 02 1B91 1BAD           89         MVC   RORN(3),TON        PUT NOT IN MSG.
 0AA8 C0 87 021A                90         B     PRINT              PRINT MAKE NOT READY
 0AAC 41                  0AAC  91         DC    XL1'41'
 0AAD 13                  0AAD  92         DC    IL1'19'
 0AAE 1B97                0AAF  93         DC    AL2(MANORE)
 0AB0 E0E0                0AB1  94         DC    XL2'E0E0'
 0AB2 F0 7C 6F                  95 LOARR   HPL   X'6F',X'7C'         NOT READY HALT
 0AB5 C1 E0 0ADE                96         TIO   R1NRDY,NRDY        IF PRINTER OK, SHOULD BRANCH
 0AB9 38 04 0208                97         TBN   SBYTE0,SSW05       PRINT ON MFCU
 0ABD F2 90 18                  98         JF    TALT
 0AC0 C0 87 021A                99         B     PRINT              PRINT NOT READY ERROR
 0AC4 C1                  0AC4 100         DC    XL1'C1'
 0AC5 1A                  0AC5 101         DC    IL1'26'
 0AC6 1BB1                0AC7 102         DC    AL2(CCRINS)
 0AC8 E031                0AC9 103         DC    XL2'E031'
 0ACA 0C 01 1BD1 1BD3           104         MVC   MAP(2),CHT10       PUT CHART NO. IN MSG.
 0ADO C0 87 021A                105         B     PRINT              PRINT PRINTER MAP CHART NO.
 0AD4 81                  0AD4  106         DC    XL1'81'
 0AD5 0A                  0AD5  107         DC    IL1'10'
 0AD6 1BD1                0AD7  108         DC    AL2(MAP)
 0AD8 C0 87 0222                109 TALT   B     HALT               *ERROR - TIO FAILED TO BRANCH
 0ADC E031                0ADD  110         DC    XL2'E031'
 0ADE C0 87 0216                111 R1NRDY B     LINK               GO TO DCP TO LINK TO NEXT ROUTINE
                                112
                                113 ********************************************************************
                                114 *                                                                  *
                                115 *      ROUTINE 3 - TIO ON BUSY TO NOT READY DEVICE                 *
                                116 *                                                                  *
                                117 ********************************************************************
 0AE2 03                  0AE2  118 RTN3    DC    XL1'3'             ROUTINE NUMBER
 0AE3 00                  0AE3  119         DC    XL1'0'             FLAGS
 0AE4 0B16                0AE5  120         DC    AL2(RTN4)          ADDRESS OF NEXT ROUTINE PREFIX
                                121 ********************************************************************
 0AE6 C1 E6 0AED                122         TIO   PRFCU,BUSY         BRANCH SHOULD NOT OCCUR
 0AEA F2 87 25                  123         J     R2EXIT
 0AED 38 04 0208                124 PRFCU   TBN   SBYTE0,SSW05       PRINT ON MFCU
 0AF1 F2 90 18                  125         JF    R2BUSY
 0AF4 C0 87 021A                126         B     PRINT              PRINT BUSY ERR
 0AF8 C1                  0AF8  127         DC    XL1'C1'
 0AF9 16                  0AF9  128         DC    IL1'22'
 0AFA 1BC7                0AFB  129         DC    AL2(BABUSY)
 0AFC E032                0AFD  130         DC    XL2'E032'
 0AFE 0C 01 1BD1 1BDD           131         MVC   MAP(2),CHT17       PUT CHART NO. IN MSG.
 0B04 C0 87 021A                132         B     PRINT              PRINT PRINTER MAP CHART NO.
 0B08 81                  0B08  133         DC    XL1'81'
 0B09 0A                  0B09  134         DC    IL1'10'
 0B0A 1BD1                0B0B  135         DC    AL2(MAP)
 0B0C C0 87 0222                136 R2BUSY B     HALT               *ERROR - TEST I/O ON BUSY FAILED
 0B10 E032                0B11  137         DC    XL2'E032'
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0B12 C0 87 0216            138 R2EXIT B     LINK                    GO LINK TO NEXT RTN VIA DCP
                              139
                              140 ********************************************************************
                              141 *                                                                  *
                              142 *       ROUTINE 4 - TIO TO READY DEVICE                            *
                              143 *                   (PROGRAM HALTS IO INDICATE PRINTER MUST BE MADE *
                              144 *                   READY, THEN ISSUES TEST I/O ON NOT READY)      *
                              145 *                                                                  *
                              146 ********************************************************************
   0B16 C4              0B16  147 RTN4   DC     XL1'4'                  ROUTINE NUMBER
   0B17 80              0B17  148        DC     XL1'80'                 FLAGS - MANUAL INTERVENTION
   0B18 0B6B            0B19  149        DC     AL2(RTN5)               ADDRESS OF NEXT ROUTINE PREFIX
                              150 ********************************************************************
   0B1A C1 E0 0B21            151        TIO    TYBS,NRDY
   0B1E F2 87 1A              152        J      R4CHK                   GO ON IF PRINTER READY
   0B21 38 04 0208            153 TYBS   TBN    SBYTE0,SSW05            PRINT ON MFCU
   0B25 F2 90 10              154        JF     R4NRDY
   0B28 0C 02 1B91 1A29       155        MVC    RORN(3),KNALB           BLANK NOT IN READY MSG
   0B2E C0 87 021A            156        B      PRINT                   PRINT MAKE READY MSG
   0B32 41              0B32  157        DC     XL1'41'
   0B33 13              0B33  158        DC     IL1'19'
   0B34 1B97            0B35  159        DC     AL2(MANDRE)
   0B36 E0E1            0B37  160        DC     XL2'E0E1'
   0B38 F0 7C 03              161 R4NRDY HPL    X'03',X'7C'             MAKE READY HALT
   0B3B C1 E0 0B42            162 R4CHK  TIO    JIVE,NRDY               TEST I/O AND BRANCH ON NOT READY
   0B3F F2 87 25              163        J      R4EXIT                   -SHD NOT BRANCH
   0B42 38 04 0208            164 JIVE   TBN    SBYTE0,SSW05            PRINT ON MFCU
   0B46 F2 90 18              165        JF     ERR41
   0B49 C0 87 021A            166        B      PRINT                   PRINT READY ERROR
   0B4D C1              0B4D  167        DC     XL1'C1'
   0B4E 1A              0B4E  168        DC     IL1'26'
   0B4F 1BF9            0B50  169        DC     AL2(SNIROC)
   0B51 E010            0B52  170        DC     XL2'E010'
   0B53 0C 01 1BD1 1BD3       171        MVC    MAP(2),CHT10            PUT CHART NO. IN MSG.
   0B59 C0 87 021A            172        B      PRINT                   PRINT PRINTER MAP CHART NO.
   0B5D 81              0B5D  173        DC     XL1'81'
   0B5E 0A              0B5E  174        DC     IL1'10'
   0B5F 1BD1            0B60  175        DC     AL2(MAP)
   0B61 C0 87 0222            176 ERR41  B      HALT                    *ERROR
   0B65 E010            0B66  177        DC     XL2'E010'
   0B67 C0 87 0216            178 R4EXIT B      LINK                    GO TO NEXT RTN VIA CONTROL PGM
                              179
                              180 ********************************************************************
                              181 *                                                                  *
                              182 *       ROUTINE 5 - TIO ON BUSY TO READY DEVICE                    *
                              183 *                   (PRINTER SHOULD BE READY. TEXT I/O ON BUSY SHOULD *
                              184 *                   NOT BRANCH)                                    *
                              185 *                                                                  *
                              186 ********************************************************************
   0B6B 05              0B6B  187 RTN5   DC     XL1'5'                  ROUTINE NUMBER
   0B6C 00              0B6C  188        DC     XL1'0'                  FLAGS
   0B6D 0C1A            0B6E  189        DC     AL2(RTN6)               ADDRESS OF NEXT ROUTINE PREFIX
                              190 ********************************************************************
   0B6F C1 E6 0B76            191        TIO    ERR51,BUSY              TEST I/O ON BUSY-SHD NOT BRANCH
   0B73 F2 87 A0              192        J      R5EXIT
   0B76 0C 01 1F9D 1850       193 ERR51  MVC    MSECS(2),SFHU
   0B7C 0D FF 0800 0800       194 TW     CLC    LPI(256),LPI            DELAY
   0B82 0D 3B 0800 0800       195        CLC    LPI(60),LPI             7.5
   0B88 0F 01 1F9D 1823       196        SLC    MSECS(2),ONE            SECS
   0B8E C0 84 0B7C            197        BH     TW
   0B92 F2 87 00              198        J      RAELC                   END OF IR W/SIO SKIP OPEN J.R.G.
   0B95 C1 E6 0B9C            199 RAELC  TIC    STILL,BUSY
   0B99 F2 87 7A              200        J      R5EXIT
   0B9C 0C 07 1C0C 1B62       201 STILL  MVC    PBCA(8),PRIN            PUT PRINTER IN BUSY MSG.
   0BA2 0C 04 1C03 1A29       202        MVC    RRAC(5),KNALB           BLANK L/R CARR<
   0BA8 3C 11 08FB            203        MVI    BERALT,X'11'            SET PRINTER HALT ID
   0BAC C1 E2 0BBB            204        TIO    UFERR,PBBUSY            PRINT BUFFER BUSY
   0BB0 C1 E4 0BC8            205        TIO    BUSLE,CABUSY            LEFT CARR.BUSY
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0BB4 C1 EC 0BDB            206        TIC    BUSRI,RICABY            RIGHT CARR.BUSY
   0BB8 F2 87 30              207        J      TEPCU
   0BBB 0C 07 1C0C 1B6A       208 UFERR  MVC    PBCA(8),BUFF            PUT BUFFER IN BUSY MSG.
   0BC1 3C 37 0BFB            209        MVI    BERALT,X'37'            SET BUFFER HALT ID
   0BC5 F2 87 23              210        J      TEPCU
   0BC8 0C 07 1C0C 1B5A       211 BUSLE  MVC    PBCA(8),CARR            PUT CARR.IN BUSY MSG
   0BCE 0C 04 1C03 1B74       212        MVC    RRAC(5),TFEL            PUT LEFT IN BUSY MSG
   0BD4 3C 38 0BF8            213        MVI    BERALT,X'38'            SET LEFT CARR.HALT ID
   0BD8 F2 87 10              214        J      TEPCU
   0BDB 0C 07 1C0C 1B5A       215 BUSRI  MVC    PBCA(8),CARR            PUT CARR IN BUSY MSG
   0BE1 0C 04 1C03 1B6F       216        MVC    RRAC(5),THGIR           PUT RIGHT IN BUSY MSG
   0BE7 3C 39 0BFB            217        MVI    BERALT,X'39'            SSET RIGHT CARR.HALT ID
   0BEB 38 04 0208            218 TEPCU  TBN    SBYTE0,SSW05            PRINT ON MFCU
   0BEF F2 90 18              219        JF     JUSALT
   0BF2 C0 87 021A            220        B      PRINT                   PRINT NOT BUSY ERR
   0BF6 C1              0BF6  221        DC     XL1'C1'
   0BF7 29              0BF7  222        DC     IL1'41'
   0BF8 1C22            0BF9  223        DC     AL2(REBUSY)
   0BFA E000            0BFB  224 BERALT DC     XL2'E000'
   0BFC 0C 01 1BD1 1BDD       225        MVC    MAP(2),CHT17            PUT CHART NO. IN MSG.
   0C02 C0 87 021A            226        B      PRINT                   PRINT PRINTER MAP CHART NO.
   0C06 81              0C06  227        DC     XL1'81'
   0C07 0A              0C07  228        DC     IL1'10'
   0C08 1BD1            0C09  229        DC     AL2(MAP)
   0C0A 0C 00 0C15 0BFB       230 JUSALT MVC    YEOW(1),BERALT          PUT ID INTO HALT
   0C10 C0 87 0222            231        B      HALT
   0C14 E000            0C15  232 YEOW   DC     XL2'E000'
   0C16 C0 87 0216            233 R5EXIT B      LINK                    GO TO NEXT ROUTINE VIA DCP
                              234
                              235 ********************************************************************
                              236 *                                                                  *
                              237 *       ROUTINE 6 - LIO'S TO A READY DEVICE                        *
                              238 *                                                                  *
                              239 ********************************************************************
   0C1A 06              0C1A  240 RTN6   DC     XL1'6'                  ROUTINE NUMBER
   0C1B 00              0C1B  241        DC     XL1'0'                  FLAGS
   0C1C 0CF6            0C1D  242        DC     AL2(RTN7)               ADDRESS OF NEXT ROUTINE PREFIX
                              243 ********************************************************************
   0C1E C0 87 140A            244        B      BROUT
   0C22 31 E4 1846            245 GIDDAP LIO    LPIADR,LPIAR            LOAD IMAGE ADDR. REG.
   0C26 0C 01 1BD1 1BD7       246        MVC    MAP(2),CHT13            PUT CHART NO. IN MSG.
   0C2C 30 E4 1F95            247        SNS    STAIX,X'E4'             GRAB IMAGE ADDR.REG.
   0C30 0D 01 1F95 1846       248        CLC    STAIX(2),LPIADR         IMAGE REG.LOADED CORRECTLY
   0C36 F2 81 3F              249        JE     GOLIO                   YES,TRY DAR
   0C39 38 04 0208            250        TBN    SBYTE0,SSW05            PRINT ON MFCU
   0C3D F2 90 32              251        JF     IMALT
   0C40 0C 04 1C31 1C2C       252        MVC    LEBAL(5),EGANI          PUT IMAGE IN MSG
   0C46 C0 87 021A            253        B      PRINT                   PRINT IMAGE ADDR.ERR
   0C4A C1              0C4A  254        DC     XL1'C1'
   0C4B 16              0C4B  255        DC     IL1'22'
   0C4C 1C42            0C4D  256        DC     AL2(ARWAL)
   0C4E E03A            0C4F  257        DC     XL2'E03A'
   0C50 C0 87 021E            258        B      UNPACK                  ACTUAL IMAGE ADDR
   0C54 02              0C54  259        DC     IL1'2'
   0C55 1F95            0C56  260        DC     AL2(STAIX)
   0C57 1C49            0C58  261        DC     AL2(DIRIS)              TO
   0C59 C0 87 021E            262        B      UNPACK                  EXPECTED
   0C5D 02              0C5D  263        DC     IL1'2'
   0C5E 1846            0C5F  264        DC     AL2(LPIADR)             FROM
   0C60 1C55            0C61  265        DC     AL2(DIRSB)              TO
   0C62 C0 87 021A            266        B      PRINT                   PRINT REG IS & SHD.BE
   0C66 81              0C66  267        DC     XL1'81'
   0C67 13              0C67  268        DC     IL1'19'
   0C68 1C55            0C69  269        DC     AL2(DIRSB)
   0C6A C0 87 021A            270        B      PRINT                   PRINT PRINTER MAP CHART NO.
   0C6E 81              0C6E  271        DC     XL1'81'
   0C6F 0A              0C6F  272        DC     IL1'10'
   0C70 1BD1            0C71  273        DC     AL2(MAP)
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0C72 C0 87 0222              274 IMALT  B     HALT                    IMAGE ADDR.REG.ERROR HALT
   0C76 E03A                0C77 275        DC    XL2'E03A'
   0C78 31 E6 184A              276 GOLIO  LIO   LPDADR,LPDAR            LOAD DATA ADDR.REEG.
   0C7C 30 E6 1F95              277        SNS   STAIX,X'E6'             GRAB DATA ADDR. REG.
   0C80 0D 01 1F95 184A         278        CLC   STAIX(2),LPDADR          DATA REG.LOADED CORRECTLY
   0C86 F2 81 3F                279        JE    FOLIC                    YES,TRY NO-OP LATCH
   0C89 39 04 0208              280        TBN   SBYTE0,SSW05             PRINT ON MFCU
   0C8D F2 90 32                281        JF    LSMFT
   0C90 0C 04 1C31 1C27         282        MVC   LEBAL(5),ATAD            PUT DATA IN MSG.
   0C96 C0 87 021A              283        B     PRINT                    PRINT DATA ADDR.REG.ERR
   0C9A C1                  0C9A 284        DC    XL1'C1'
   0C9B 16                  0C9B 285        DC    IL1'22'
   0C9C 1C42                0C9D 286        DC    AL2(ARWAL)
   0C9E E034                0C9F 287        DC    XL2'E034'
   0CA0 C0 87 021E              288        B     UNPACK                   ACTUAL ADDR.REG.
   0CA4 02                  0CA4 289        DC    IL1'2'
   0CA5 1F95                0CA6 290        DC    AL2(STAIX)               FROM
   0CA7 1C49                0CA8 291        DC    AL2(DIRIS)               TO
   0CA9 C0 87 021E              292        B     UNPACK                   EXPACTED DATA ADDR.
   0CAD 02                  0CAD 293        DC    IL1'2'
   0CAE 184A                0CAF 294        DC    AL2(LPDADR)              FROM
   0CB0 1C55                0CB1 295        DC    AL2(DIRSB)               TO
   0CB2 C0 87 021A              296        B     PRINT                    PRINT REG.IS & SHD BE
   0CB6 81                  0CB6 297        DC    XL1'81'
   0CB7 13                  0CB7 298        DC    IL1'19'
   0CB8 1C55                0CB9 299        DC    AL2(DIRSB)
   0CBA C0 87 021A              300        B     PRINT                    PRINT PRINTER MAP CHART NO.
   0CBE 81                  0CBE 301        DC    XL1'81'
   0CBF 0A                  0CBF 302        DC    IL1'10'
   0CC0 1BD1                0CC1 303        DC    AL2(MAP)
   0CC2 C0 87 0222              304 LSMFT  B     HALT                     DATA ADDR.REG.ERROR HALT
   0CC6 EC34                0CC7 305        DC    XL2'EC34'
   0CC8 30 E3 1F93              306 FOLIO  SNS   STAT6,X'E3'              GET STATUS BYTES
   0CCC 38 01 1F92              307        TBN   STAT6-1,B'1'             NO-OP CHECK
   0CD0 F2 90 1F                308        JF    R6EXIT
   0CD3 38 04 0208              309        TBN   SBYTE0,SSW05             PRINT ON MFCU
   0CD7 F2 90 12                310        JF    LALT
   0CDA C0 87 021A              311        B     PRINT
   0CDE C1                  0CDE 312        DC    XL1'C1'
   0CDF 22                  0CDF 313        DC    IL1'34'
   0CE0 1C77                0CE1 314        DC    AL2(NOPLIO)
   0CE2 E03C                0CE3 315        DC    XL2'E03C'
   0CE4 C0 87 021A              316        B     PRINT                    PRINT PRINTER MAP CHART NO.
   0CE8 81                  0CE8 317        DC    XL1'81'
   0CE9 0A                  0CE9 318        DC    IL1'10'
   0CEA 1BD1                0CEB 319        DC    AL2(MAP)
   0CEC C0 87 0222              320 LALT   B     HALT                     NO-OP HALT
   0CF0 E03C                0CF1 321        DC    XL2'E03C'
   0CF2 C0 87 0216              322 R6EXIT B     LINK                     GO TO NEXT ROUTINE
                                323
                                324 ********************************************************************************
                                325 *                                                                              *
                                326 *       ROUTINE 7 - COMMANDS TEST FROM TABLE                                   *
                                327 *                   (PROGRAM ISSUES COMMANDS SEQUENTIALLY FROM TABLE           *
                                328 *                   -CMDTAB-)                                                  *
                                329 *                                                                              *
                                330 ********************************************************************************
   0CF6 07                  0CF6 331 RTN7   DC    XL1'7'                   ROUTINE NUMBER
   0CF7 CC                  0CF7 332        DC    XL1'0'                   FLAGS
   0CF8 0D0A                0CF9 333        DC    AL2(RTN8)                ADDRESS OF NEXT ROUTINE PREFIX
                                334 ********************************************************************************
   0CFA 3C 01 1FA1              335        MVI   LICTR,X'01'              SET LINE COUNTER TO 1
   0CFE C2 01 1FA6              336        LA    CMDTAB,XR1               SET UP COMMAND TABLE POINTER
   0D02 C0 87 12A3              337        B     CKCMD                    GO ISSUES COMMANDS FROM THIS TABLE
   0D06 C0 87 0216              338        B     LINK                     LINK TO NEXT ROUTINE
                                339
                                340 ********************************************************************************
                                341 *                                                                              *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                             342 *       ROUTINE 8 - CARRIAGE SPACE-SKIP TEST                                   *
                             343 *                                                                              *
                             344 ********************************************************************************
   0D0A 08                  0D0A 345 RTN8   DC    XL1'8'                   ROUTINE NUMBER
   0D0B 00                  0D0B 346        DC    XL1'0'                   FLAGS
   0D0C 0E80                0D0D 347        DC    AL2(RTN9)                ADDRESS OF NEXT ROUTINE PREFIX
                                348 ********************************************************************************
   0D0E C0 87 1432              349        B     XIO                      MAKE SURE CARR.IS
   0D12 E401                0D13 350        DC    XL2'E401'                ON LINE NO. 1
   0D14 3C 01 1FA1              351        MVI   LICTR,X'01'              SET LINE COUNTER AT 1
   0D18 C2 01 1FC6              352        LA    SPSK-2,XR1               LOAD CMD.ADDR.REG.
   0D1C 36 01 1825              353 BACGO  A     TWO,XR1                  UPDATE CMD.ADDR.REG.
   0D20 1C 01 1F97 01           354        MVC   CMDSAV(2),1(,XR1)        SAVE THE CMD.
   0D25 C2 02 0883              355        LA    LPD+7,XR2                LOAD MSG.ADDR.REG.
   0D29 30 E0 1F8D              356        SNS   STAT0,X'E0'              GRAB LINE COUNTERS
   0D2D 38 80 0209              357        TBN   SBYTE1,SSW08             RIGHT CARR.
   0D31 F2 90 08                358        JF    FRANG
   0D34 C0 87 13B9              359        B     CVD                      CONVERT RIGHT LINE CTR.
   0D38 1F8D                0D39 360        DC    AL2(STAT0)               FROM
   0D3A 186A                0D3B 361        DC    AL2(DASH)                TO
   0D3C F2 87 08                362        J     MODASH
   0D3F C0 87 13B9              363 FRANG  B     CVD                      CONVERT LINE NO. TO DEC.
   0D43 1F8C                0D44 364        DC    AL2(STAT0-1)
   0D45 186A                0D46 365        DC    AL2(DASH)                TO
   0D47 8C 07 00 186A           366 MODASH MVC   0(8,XR2),DASH            MOVE INTO PRINT AREA
   0D4C C0 87 13B9              367        B     CVD                      CONVERT LINE COUNT OF CMD.TO DEC.
   0D50 1F97                0D51 368        DC    AL2(CMDSAV)              FROM
   0D52 188E                0D53 369        DC    AL2(SKLINO)              TO
   0D54 0C 00 1882 188E         370        MVC   SPOP(1),SKLINO           MOVE COUNT INTO SPACE MSG. ALSO
   0D5A 36 02 182F              371        A     TWLVE,XR2                UPDATE MSG.ADDR.REG.
   0D5E 8C 0B 00 1882           372        MVC   0(12,XR2),SPOP           PUT SPACE MSG. IN PRINT AREA
   0D63 0E 00 1FA1 1F97         373        ALC   LICTR(1),CMDSAV          ADD SPACES TO LINE COUNT
   0D69 0D 00 1FA1 1841         374 CKOUNT CLC   LICTR(1),FOLG            LINE COUNT FULL
   0D6F F2 04 CC                375        JNH   JUMRES
   0D72 0C 01 0D7D 0D6E         376        MVC   RSOUNT+5(2),CKOUNT+5
   0D78 0F 00 1FA1 0000         377 RSOUNT SLC   LICTR(1),*-*              RESET LINE COUNT
   0D7E 78 04 00                378 JUMRES TBN   0(,XR1),X'04'             IS THIS A SKIP
   0D81 F2 90 53                379        JF    ITSASP                   JUMP IF ITSA SPACE
   0D84 8C 0B 00 188E           380        MVC   0(12,XR2),SKLINO         PUT SKIP MSG.IN PRINT AREA
   0D89 0C 00 1FA1 1F97         381        MVC   LICTR(1),CMDSAV          MOVE IN LINE NO. TO SKIP TO
   0D8F 7D 2A 01                382        CLI   1(,XR1),X'2A'            IS THIS A SKIP TO LINE 42
   0D92 F2 01 15                383        JNE   NEXLEN                   JUMP IF NOT
   0D95 0C 01 14C2 1854         384        MVC   FRMLE+3(2),ADFL42        PUT  42 ADDR.IN LIO
   0D9B 0C 01 0DDC 1854         385        MVC   FRADD(2),ADFL42          PUT THE FROM ADDR.IN FORM LEN.LINK.
   0DA1 0C 01 0D6E 1854         386        MVC   CKOUNT+5(2),ADFL42
   0DA7 F2 87 2D                387        J     ITSASP                   JUMP TO CONVERT TO DEC.
   0DAA 7D 55 01                388 NEXLEN CLI   1(,XR1),X'55'            IS THIS A SKIP TO LINE 85
   0DAD F2 01 15                389        JNE   DO112                    JUMP IF NOT
   0DB0 0C 01 14C2 1856         390        MVC   FRMLE+3(2),ADFL85        PUT  85 ADDR.IN LIO
   0DB6 0C 01 0DDC 1856         391        MVC   FRADD(2),ADFL85          PUT THE FROM ADDR.IN FORM LEN.LINK.
   0DBC 0C 01 0D6E 1856         392        MVC   CKOUNT+5(2),ADFL85
   0DC2 F2 87 12                393        J     ITSASP
   0DC5 0C 01 14C2 1858         394 DO112  MVC   FRMLE+3(2),ADFOLG        PUT 112 ADDR.IN LIO
   0DCB 0C 01 0DDC 1858         395        MVC   FRADD(2),ADFOLG          PUT THE FROM ADDR.IN FORM LEN.LINK.
   0DD1 0C 01 0D6E 1858         396        MVC   CKOUNT+5(2),ADFOLG
   0DD7 C0 87 13B9              397 ITSASP B     CVD                      CONVERT TO DEC.FORM LEN.
   0DDB 0000                0DDC 398 FRADD  DC    XL2'0'                   FROM ADDR.
   0DDD 18F1                0DDE 399        DC    AL2(LNGTH)               TO ADDR.
   0DDF 36 02 1831              400        A     SVNTEN,XR2               UPDATE MSG.ADDR.REG.
   0DE3 8C 10 00 18F1           401        MVC   0(17,XR2),LNGTH          PUT FORM LEN. MSG. IN PRINT AREA
   0DE8 C0 87 1438              402        B     SKIXIG                   PRINT A LINE
   0DEC E200                0DED 403        DC    XL2'E200'
   0DEE 1C 01 0DF8 01           404        MVC   PUTSUM(2),1(,XR1)        PUT A CARR. CMD.INTO LINKAGE
   0DF3 C0 87 1438              405        B     SKIXIG                   DO CARR.CMD.
   0DF7 0000                0DF8 406 PUTSUM DC    XL2'0'                   CMD.PARAMETER
   0DF9 30 E0 1F8D              407        SNS   STAT0,X'E0'              GRAB CARR.LINE COUNTER
   0DFD 38 80 0209              408        TBN   SBYTE1,SSW08             RIGHT CARR.
   0E01 F2 90 12                409        JF    LEFLIC
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E013 5203 LINE PRINTER FUNCTION TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0E04 0C 04 18CB 1B6F         410        MVC    WICH-1(5),THGIR
    0E0A 0C 00 1F8D 1FA1         411        CLC    STATC(1),LICTR          RIGHT LINE LOC.CORRECT
    0E10 F2 01 1D                412        JNE    MUSTU                   JUMP IF NOT
    0E13 F2 87 0F                413        J      ISLAS
    0E16 0C 04 18CB 1B74         414 LEFLIC MVC    WICH-1(5),TFEL
    0E1C 0D 00 1F8C 1FA1         415        CLC    STATO-1(1),LICTR        LINE LOCATION CORRECT
    0E22 F2 01 0B                416        JNE    MUSTU
    0E25 7D 00 C1                417 ISLAS  CLI    1(,XR1),X'00'           LAST CMD. DONE
    0E28 C0 81 0E76              418        BE     CLINK                   EXIT
    0E2C C0 87 0D1C              419        B      BACGO
    0E30 3A 01 1F8B              420 MUSTU  SBN    TAGS,TAG7               SET 1ST LINES ONLY FLAG
    0E34 0C 00 1780 0E71         421        MVC    HLTID(1),LUKE           PUT HALT ID IN MSG
    0E3A C0 87 1732              422        B      PSTERR                  GO PRINT STATUS OR 1ST LINES
    0E3E 38 02 1F8B              423        TBN    TAGS,TAG6               WAS THERE A STATUS ERR
    0E42 F2 10 0D                424        JT     STBEP                   JUMP TO LOAD SHORT MSG.COUNT
    0E45 3C 2D 0E5B              425        MVI    LCML,45                 SET A MSG.COUNT OF 45
    0E49 0C 05 18CC 1A29         426        MVC    HICH(6),KNALB
    0E4F F2 87 04                427        J      TNIRP                   JUMP TO PRINT
    0E52 3C 1A 0E5B              428 STBEP  MVI    LCML,26                 SER MSG. COUNT OF 26
    0E56 C0 87 021A              429 TNIRP  B      PRINT                   PTINT LINE COUNTER ERR
    0E5A 81                 0E5A 430        DC     XL1'81'
    0E5B C0                 0E5B 431 LCML   DC     XL1'0'                  COUNT
    0E5C 18E0               0E5D 432        DC     AL2(LICOER)
    0E5E 0C 01 18D1 18D9         433        MVC    MAP(2),CHT14            PUT CHART NO. IN MSG.
    0E64 C0 87 021A              434        B      PRINT                   PRINT PRINTER MAP CHART NO.
    0E68 85                 0E68 435        DC     XL1'85'
    0E69 0A                 0E69 436        DC     IL1'10'
    0E6A 1BD1               0E6B 437        DC     AL2(MAP)
    0E6C CC 87 0222              438        B      HALT                    LINE COUNTER ERR HALT
    0E70 E033               0E71 439 LUKE   DC     XL2'E033'
    0E72 C0 87 0E25              440        B      ISLAS
    0E76 C0 87 1432              441 CLINK  B      XIO
    0E7A E002               0E7B 442        DC     XL2'E002'          SPACE 2
    0E7C C0 87 0216              443        B      LINK
                                 444
                                 445 ***********************************************************************
                                 446 *                                                                     *
                                 447 *      ROUTINE 9 - 'H' & 'T' PRINT TEST                               *
                                 448 *                                                                     *
                                 449 ***********************************************************************
    0E80 09                 0E80 450 RTN9   DC     XL1'9'                  ROUTINE NUMBER
    0E81 00                 0E81 451        DC     XL1'0'                  FLAGS
    0E82 0F14               0E83 452        DC     AL2(RTNOA)              ADDRESS OF NEXT ROUTINE PREFIX
                                 453 ***********************************************************************
    0E84 C0 87 021A              454        B      PRINT                   PRINT TITLE
    0E88 42                 0E88 455        DC     XL1'42'
    0E89 10                 0E89 456        DC     IL1'16'
    0E8A 1904               0E8B 457        DC     AL2(TITL9)
    0E8C EC00               0E8D 458        DC     XL2'EC00'
    0E8E 3C C8 0EB4              459        MVI    ROCON+1,C'H'            PUT H IN PRINT LINE
    0E92 3B FF 1F99              460 FINFF  SBF    FINDEX,X'FF'            ZERO COUNTER
    0E96 39 30 0A0C              461        TBF    SPUDT,B'110000'         100 LPM PRINTER?
    0E9A F2 10 12                462        JT     SUNERD
    0E9D 30 E2 1F8F              463        SNS    STAT2,X'E2'             GRAB TIMINGS
    0EA1 38 01 1F8F              464        TBN    STAT2,B'1'              HAMMERS IN M4
    0EA5 F2 90 59                465        JF     MOOM
    0EA8 39 30 0A0C              466 NOCOR  TBF    SPUDT,B'110000'         100 LPM PRINTER?
    0EAC F2 90 04                467        JF     ROCON
    0EAF C0 87 1275              468 SUNERD B      M4DEL
    0EB3 3C 00 08FF              469 ROCON  MVI    PRDAT,*-*               INSERT AN 'H' OR A 'T'
    0EB7 0C 83 08FE 08FF         470        MVC    PRDAT-1(132),PRDAT      PROPAGATE IT
    0EBD 0E 00 1F99 1823         471        ALC    FINDEX(1),ONE           ADD 1 TO COUNTER
    0EC3 CC 87 1432              472        B      XIO                     BR TO PRINT A LINE
    0EC7 E201               0EC8 473        DC     XL2'E201'
    0EC9 3D 19 1F99              474        CLI    FINDEX,X'19'            25 LINES PRINTED
    0ECD C0 01 0EA8              475        BNE    NOCOR
    0ED1 3D E3 0EB4              476        CLI    ROCON+1,C'T'            HAVE T'S BEEN PRINTED
    0ED5 F2 81 33                477        JE     GETOUT
```


E013 5203 LINE PRINTER FUNCTION TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0ED8 3C E3 0EB4              478        MVI    ROCON+1,C'T'            PUT T IN PRINT LINE
    0EDC C2 02 087A              479        LA     LPD-2,XR2               LOAD PRINT ADDR.
    0EE0 3C 40 08FE              480        MVI    PRDAT-1,X'40'
    0EE4 04 10 1B1A 1851         481        ZAZ    HANO(2),DECZRO(1)       ZERO HAMMER NO.
    0EEA 36 02 1829              482 NEAMR  A      FOUR,XR2                INCR.PRINT ADDR.
    0EEE 06 10 1B1A 1852         483        AZ     HANO(2),DECONE(1)       ADD 1 TO HAMR.NO.
    0EF4 8C 01 00 1B1A           484        MVC    0(2,XR2),HANO           PUT HAMMER NO. IN PRINT AREA
    0EF9 3D 40 08FE              485        CLI    PRDAT-1,X'40'           END OF PRINT LINE
    0EFD C0 81 0EEA              486        BE     NEAMR
    0F01 C0 87 1432              487 MOOM   B      XIO                     PRINT HAMMER NUMBERS
    0F05 E201               0F06 488        DC     XL2'E201'
    0F07 C0 87 0E92              489        B      FINFF
    0F0B C0 87 021A              490 GETOUT B      PRINT                   BR TO SPACE 4
    0F0F 14                 0F0F 491        DC     XL1'14'
    0F10 C0 87 0216              492        B      LINK
                                 493
                                 494 ***********************************************************************
                                 495 *                                                                     *
                                 496 *      ROUTINE 0A - PAPER SETTLING TEST                               *
                                 497 *                                                                     *
                                 498 ***********************************************************************
    0F14 0A                 0F14 499 RTNOA  DC     XL1'A'                  ROUTINE NUMBER
    0F15 00                 0F15 500        DC     XL1'0'                  FLAGS
    0F16 0FE4               0F17 501        DC     AL2(RTNOB)              ADDRESS OF NEXT ROUTINE PREFIX
                                 502 ***********************************************************************
    0F18 C0 87 021A              503        B      PRINT                   PRINT TITLE
    0F1C 42                 0F1C 504        DC     XL1'42'
    0F1D 13                 0F1D 505        DC     IL1'19'
    0F1E 1917               0F1F 506        DC     AL2(TITLA)
    0F20 E000               0F21 507        DC     XL2'E000'
    0F22 38 80 0209              508        TBN    SBYTE1,SSW08            PRINT ON RIGHT CARR.
    0F26 F2 90 0F                509        JF     ITSLEF
    0F29 3A 08 0F8E              510        SBN    PSSIO1+1,B'1000'        SET MODIFIER BIT ON
    0F2D 3A 08 0F91              511        SBN    SBUSY+1,B'1000'         SET MODIFIER BIT ON
    0F31 3A 08 0F9D              512        SBN    PSSIO2+1,B'1000'        SET MODIFIER BIT ON
    0F35 F2 87 0C                513        J      OGOG
    0F38 3B 08 0F8E              514 ITSLEF SBF    PSSIO1+1,B'1000'        SET MODIFIER BIT OFF
    0F3C 3B 08 0F91              515        SBF    SBUSY+1,B'1000'         SET MODIFIER BIT OFF
    0F40 3B 08 0F9D              516        SBF    PSSIO2+1,B'1000'        SET MODIFIER BIT OFF
    0F44 3B FF 1F99              517 OGOG   SBF    FINDEX,X'FF'            ZERO COUNTER
    0F48 39 30 0A0C              518 SIOST  TBF    SPUDT,B'110000'         100 LPM PRINTER?
    0F4C F2 10 1E                519        JT     GOM4
    0F4F 30 E2 1F93              520        SNS    STAT6,X'E2'             GRAB THE SENSE BYTES
    0F53 38 01 1F93              521        TBN    STAT6,B'1'              HAMMERS IN RIGHT SHIFT POS.
    0F57 F2 10 17                522        JT     HANG
    0F5A CC 87 1432              523        B      XIO                     PRINT A BLANK LINE
    0F5E E200               0F5F 524        DC     XL2'E200'
    0F60 C0 87 0F48              525        B      SIOST
    0F64 C0 87 0222              526 PRNRDY B      HALT                    BR TO CHECK HALT ON ERROR
    0F68 E010               0F69 527        DC     XL2'E010'               AFTER NOT READY
    0F6A F2 87 C4                528        J      HANG
    0F6D C0 87 1275              529 GOM4   B      M4DEL
    0F71 C1 E0 0F64              530 HANG   TIO    PRNRDY,NRDY             NOT READY
    0F75 C0 87 140A              531        B      BROUT
    0F79 3C 4B 08DB              532        MVI    ATEATE,C'.'             PUT A PERIOD IN 96
    0F7D 0C 5B 08D7 08DB         533        MVC    ATEFIV-1(92),ATEATE     PROPAGATE IT
    0F83 3C 4B 1F77              534        MVI    EDIMAG,C'.'             PUT A PERIOD IN IMAGE AREA
    0F87 0C 76 1F76 1F77         535        MVC    EDIMAG-1(119),EDIMAG    AND PROPAGATE IT
    0F8D F3 E0 01                536 PSSIO1 SIO    X'01',X'E0'             SPACE 1
    0F90 C1 E4 0F9)              537 SBUSY  TIO    SBUSY,CABUSY            WAIT
    0F94 C1 E0 0F64              538        TIO    PRNRDY,NRDY             IS PRINTER READY
    0F98 31 E4 184E              539        LIO    SIADD,LPIAR             IMAGE ADDR.
    0F9C F3 E2 0C                540 PSSIO2 SIO    X'00',X'E2'             PRINT A LINE
    0F9F 35 01 1821              541        L      ZERC,XR1
    0FA3 C1 E6 0FAA              542 TEGAN  TIO    BZOOP,BUSY              CHECK BUSY
    0FA7 F2 87 0E                543        J      SATCH                   BR TO SET UP ANOTHER PRINT COMMMND
    0FAA 36 01 1823              544 BZOOP  A      ONE,XR1                 WAIT FOR 1.4 SEC.
    0FAE C0 01 0FA3              545        BNZ    TEGAN                   TO CLEAR BUSY
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ERR LCC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0FB2 C0 87 0222             546        B     HALT
   0FB6 E014              0FB7 547        DC    XL2'E014'
   0FB8 0C 02 08DA 18F4        548 SATCH  MVC   ATEATE-1(3),TEES       PUT T'S IN DATA AREA
   0FBE 0C 5B 08D6 08DA        549        MVC   ATEFIV-2(92),ATEATE-1  PROPAGATE THE T'S
   0FC4 C0 87 1432             550        B     XIO
   0FC8 E201              0FC9 551        DC    XL2'E201'
   0FCA 3D 14 1F99             552        CLI   FINDEX,20              20 LINE PRINTED
   0FCE F2 81 0A               553        JE    THROUT                 BR TO LEAVE ROUTINE
   0FD1 0E 00 1F99 1823        554        ALC   FINDEX(1),ONE          ADD 1 TO LINE COUNT
   0FD7 C0 87 0F48             555        B     SIOST
   0FDB C0 87 021A             556 THROUT B     PRINT                  SPACE 2
   0FDF 12                0FDF 557        DC    XL1'12'
   0FE0 C0 87 0216             558        B     LINK
                               559
                               560 ***********************************************************************
                               561 *
                               562 *      ROUTINE OB - WORSE CASE PRINT TEST
                               563 *
                               564 ***********************************************************************
   0FE4 0B                0FE4 565 RTNOB  DC    XL1'B'                 ROUTINE NUMBER
   0FE5 C0                0FE5 566        DC    XL1'0'                 FLAGS
   0FE6 104C              0FE7 567        DC    AL2(RTNOC)             ADDRESS OF NEXT ROUTINE PREFIX
                               568 ***********************************************************************
   0FE8 C0 87 021A             569        B     PRINT                  PRINT 'WORSE CASE PRINT TEST'
   0FEC 42                0FEC 570        DC    XL1'42'
   0FED 15                0FED 571        DC    IL1'21'
   0FEE 192C              0FEF 572        DC    AL2(TITLB)
   0FF0 E000              0FF1 573        DC    XL2'E000'
   0FF2 3B FF 1F99             574        SBF   FINDEX,X'FF'           ZERO LINE COUNTER
   0FF6 3C C8 08C3             575 GETAH  MVI   DASTU,C'H'             INSERT AN 'H'
   0FFA 0C 46 08C2 08C3        576        MVC   DASTU-1(71),DASTU      PROPAGATE IT
   1000 C0 87 1432             577        B     XIO                    PRINT A LINE AND SPACE 1
   1004 E201              1005 578        DC    XL2'E201'
   1006 C2 02 080C             579        LA    LPI,XR2                LOAD IMAGE ADDRESS
   100A C2 01 087B             580        LA    LPD-1,XR1              LOAD DATA ADDRESS
   100E 36 02 1825             581 NADUN  A     TWO,XR2                ADD 2 TO IMAGE ADDR.
   1012 36 01 1827             582        A     TREE,XR1               ADD 3 TO DATA ADDR.
   1016 6C 02 00 00            583        MVC   0(3,XR1),0(,XR2)       MOVE 3 CHAR. INTO DAT A AREA
   101A 34 02 1F9B             584        ST    SINDEX,XR2             SAVE IMAGE ADDR.
   101E 0D 01 1F9B 1848        585        CLC   SINDEX(2),TUFORF       IMAGE ADDR. UP 48
   1024 C0 82 100E             586        BL    NADUN                  BR TO MOVE IN 3 MORE
   1028 3C 40 08C3             587        MVI   LPD+71,X'40'           BLANK PRINT POSITION 72
   102C C0 87 1432             588        B     XIO                    PRINT A LINE AND SPACE 2
   1030 E202              1031 589        DC    XL2'E202'
   1032 3D 19 1F99             590        CLI   FINDEX,X'19'           25 TIMES THRU
   1036 F2 81 0A               591        JE    ZIGOUT
   1039 0E 00 1F99 1823        592        ALC   FINDEX(1),ONE          INCREMENT LINE COUNTER
   103F C0 87 0FF6             593        B     GETAH
   1043 C0 87 021A             594 ZIGOUT B     PRINT                  SPACE 2
   1047 12                1047 595        DC    XL1'12'
   1048 C0 87 0216             596        P     LINK
                               597
                               598 ***********************************************************************
                               599 *                                                                     *
                               600 *      ROUTINE OC - RIPPLE PRINT PATTERN                              *
                               601 *                   (PROGRAM PRINTS ROUTINE TITLE AND THEN PRINTS ALL *
                               602 *                   CHAIN CHARACTERS IN A RIPPLE PATTERN. EACH LINE   *
                               603 *                   CONTAINS THE CHAIN IMAGE REPEATED AS MANY TIMES   *
                               604 *                   AS POSSIBLE IN THE PRINT LINE. SUCCEEDING LINES   *
                               605 *                   ARE DISPLACED ONE CHARACTER TO THE RIGHT TO       *
                               606 *                   PROVIDE A LEFT TO RIGHT RIPPLE. THIS ROUTINE IS   *
                               607 *                   ESPECIALLY USEFUL DURING PRINT CHAIN  CLEANING.)  *
                               608 *                                                                     *
                               609 ***********************************************************************
   104C 0C                104C 610 RTNOC  DC    XL1'C'                 ROUTINE NUMBER
   104D 00                104D 611        DC    XL1'0'                 FLAGS - NONE
   104E 10F5              104F 612        DC    AL2(RTNOD)             ADDRESS OF NEXT ROUTINE PREFIX
                               613 ***********************************************************************
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1050 C0 87 021A             614        B     PRINT                  PRINT TITLE
   1054 42                1054 615        DC    XL1'42'
   1055 0C                1055 616        DC    IL1'12'
   1056 1938              1057 617        DC    AL2(MSGC)
   1058 E000              1059 618        DC    XL2'E000'              *
   105A 39 06 0A0C             619        TBF   SPUDT,B'110'           96 PRT.POS.DEVICE?
   105E F2 10 27               620        JT    SEFILD
   1061 3C 83 10B6             621        MVI   RESET1+1,131
   1065 3C 83 10BA             622        MVI   RESET2+1,131
   1069 3C 83 1596             623        MVI   FRSMV+2,131
   106D 3C 84 159B             624        MVI   SNDMV+3,132
   1071 38 02 0A0C             625        TBN   SPUDT,B'10'            132 PRT.POS.DEVICE?
   1075 F2 10 10               626        JT    SEFILD                 IF NOT,MUST BE 120
   1078 3C 77 10B6             627        MVI   RESET1+1,119
   107C 3C 77 10BA             628        MVI   RESET2+1,119
   1080 3C 77 1596             629        MVI   FRSMV+2,119
   1084 3C 78 159B             630        MVI   SNDMV+3,120
   1088 0C 2F 1F84 082F        631 SEFILD MVC   PFIELD(48),ATETUF      SET UP 48 CHAR.RIPPLE FIELD
   108E 0C 53 1F54 1F84        632        MVC   PFIELD-48(84),PFIELD
   1094 3D FF 0878             633        CLI   UCSFLG,X'FF'           THIS A 120 CHAR.CHAIN
   1098 F2 01 0C               634        JNE   DORIPL
   109B 0C 77 1F84 0877        635        MVC   PFIELD(120),ATSVNS     SET UP 120 CHAR.RIPPLE FIELD
   10A1 0C 0B 1F0C 1F84        636        MVC   PFIELD-120(12),PFIELD
   10A7 C2 01 087C             637 DORIPL LA    LPD,XR1                LOAD DATA AREA ADDR.
   10AB C2 02 1F00             638        LA    PFIELD-132,XR2         LOAD PRINT FIELD ADDR.
   10AF 0C 83 08FF 1F84        639        MVC   LPD+131(132),PFIELD    FILL DATA FIELD
   10B5 3C 5F 1595             640 RESET1 MVI   FRSMV+1,95             RESET 1ST MOVE COUNT
   10B9 3C 5F 1597             641 RESET2 MVI   FRSMV+3,95             RESET 1ST MOVE DISPL.
   10BD 3C 00 1599             642        MVI   SNDMV+1,X'00'          RESET 2ND MOVE COUNT
   10C1 3C 00 159A             643        MVI   SNDMV+2,X'00'          RESET 2ND MOVE DISPL.
   10C5 C0 87 1432             644 RPLOOP B     XIO                    PRINT THE LINE
   10C9 E201              10CA 645        DC    XL2'E201'              *
   10CB 0F 00 1595 1823        646        SLC   FRSMV+1(1),ONE         DECR.1ST MOVE COUNT
   10D1 0F 00 1597 1823        647        SLC   FRSMV+3(1),ONE         DECR.MOVE DISPL.OF PFIELD
   10D7 0E 00 1599 1823        648        ALC   SNDMV+1(1),ONE         INCR. 2ND MOVE COUNT
   10DD 0E 00 159A 1823        649        ALC   SNDMV+2(1),ONE         INCR. MOVE DISPL. OF DATA AREA
   10E3 3D FF 1595             650        CLI   FRSMV+1,X'FF'          RIPPLE COMPLETE ?
   10E7 C0 01 10C5             651        BNE   RPLOOP
   10EB C0 87 021A             652        B     PRINT                  SPACE 2 LINES
   10EF 12                10EF 653        DC    XL1'12'
   10F0 C0 87 0216             654        B     LINK                   CHAIN ROUTINE VIA DCP
                               655
                               656 ***********************************************************************
                               657 *                                                                     *
                               658 *      ROUTINE OD - UNPRINTABLE CHARACTER CHECK                       *
                               659 *                                                                     *
                               660 ***********************************************************************
   10F4 00                10F4 661 ADDATE DC    XL1'0'                 ADD ONLY 8 FLAG
                               662
   10F5 0D                10F5 663 RTNOD  DC    XL1'D'                 ROUTINE NUMBER
   10F6 00                10F6 664        DC    XL1'0'                 FLAGS - NONE
   10F7 119D              10F8 665        DC    AL2(RTNOE)             ADDRESS OF NEXT ROUTINE PREFIX
                               666 ***********************************************************************
   10F9 C0 87 021A             667        B     PRINT                  PRINT TITLE
   10FD 42                10FD 668        DC    XL1'42'
   10FE 17                10FE 669        DC    IL1'23'
   10FF 194F              1100 670        DC    AL2(UNCSK)
   1101 E000              1102 671        DC    XL2'E000'
   1103 C2 02 112C             672        LA    ADTUSX,XR2
   1107 3C FB 1154             673        MVI   HOMANY+1,X'FB'         SET END AT PRINT POS.128
   110B 38 02 0A0C             674        TBN   SPUDT,B'10'            IS THIS A 132 POS.PRINTER
   110F F2 1C 0F               675        JT    GRED
   1112 3C F3 1154             676        MVI   HOMANY+1,X'F3'         SET END AT PRINT POS.120
   1116 38 04 0A0C             677        TBN   SPUDT,B'100'           IS THIS A 120 POS.PRINTER
   111A F2 10 04               678        JT    GRED
   111D C2 02 1192             679        LA    DOUT,XR2               SET END AT PRINT POS.94
   1121 34 02 1152             680 GRED   ST    BWHER+3,XR2
   1125 C2 01 C87D             681        LA    LPD+1,XR1              LOAD DATA ADDR&REG.
```

E013 5203 LINE PRINTER FUNCTION TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  1129 F2 87 04                682         J     WUNTH
  112C 36 01 1835              683 ADTUSX  A     TWYSIX,XR1          ADD 26 TO DATA ADDR.
  1130 3C 01 1DF4              684 WUNTH   MVI   ADDATE,X'01'        SET ADD ONLY 8 FLAG
  1134 7C FF 00                685 NEXCAR  MVI   0(,XR1),X'FF'      PUT UNPRTABLE IN DATA AREA
  1137 C0 87 1432              686         B     XIO
  113B E200            113C    687         DC    XL2'E200'
  113D 7C 40 00                688         MVI   0(,XR1),X'40'       BLANK THE LAST UNPRT.CHAR.
  1140 38 02 1F93              689         TBN   STAT6,B'10'         UNPRINTABLE CHAR. SKIPPED
  1144 F2 90 27                690         JF    UPCER               GO PRINT ERR
  1147 34 C1 1F99              691         ST    FINDEX,XR1
  114B 3D D9 1F99              692         CLI   FINDEX,X'D9'
  114F C0 81 0000              693 BWHER   BE    *-*                 GO ADD ONLY 26 OR GET OUT
  1153 3D 00 1F99              694 HOMANY  CLI   FINDEX,*-*           DONE ENOUGH PRINT POSITIONS
  1157 F2 81 38                695         JE    DOUT                JUMP TO EXIT
  115A 36 01 182C              696         A     EIGHT,XR1           ADD 8 TO DATA ADDR.
  115E 38 01 1DF4              697         TBN   ADDATE,X'01'        ADD ONLY 8
  1162 C0 90 112C              698         BF    ADTUSX
  1166 3C 00 1DF4              699         MVI   ADDATE,X'00'        RESET ADD ONLY 8 FLAG
  116A C0 87 1134              700         B     NEXCAR
  116E C0 87 1432              701 UPCER   B     XIO                 SPACE 1
  1172 E001            1173    702         DC    XL2'E001'           SPACE ONCE
  1174 C0 87 021A              703         B     PRINT               PRINT UNPRTABLE ERR MSG.
  1178 C1              1178    704         DC    XL1'C1'
  1179 3D              1179    705         DC    IL1'61'
  117A 197D            117B    706         DC    AL2(WUDF)
  117C E03E            117D    707         DC    XL2'E03E'
  117E 0C 01 1BD1 1BDB         708         MVC   MAP(2),CHT16        PUT CHART NO.IN MSG.
  1184 C0 87 021A              709         B     PRINT               PRINT PRINTER MAP CHART NO.
  1188 85              1188    710         DC    XL1'85'
  1189 0A              1189    711         DC    IL1'10'
  118A 1BD1            118B    712         DC    AL2(MAP)
  118C C0 87 0222              713         B     HALT                UNPRTABLE ERR HALT
  1190 E03E            1191    714         DC    XL2'E03E'
  1192 C0 87 1432              715 DOUT    B     XIO
  1196 E200            1197    716         DC    XL2'E200'
  1198 C0 87 022A              717         B     LOAD
  119C 00              119C    718         DC    XL1'00'
                               719
                               720 ********************************************************************************
                               721 *                                                                              *
                               722 *                    ROUTINE E - COMMANDS TEST--FROM SWITCHES                  *
                               723 *                                                                              *
                               724 *   THE PROGRAM PRINTS INSTRUCTIONS FOR CONSOLE DATA SWITCH ENTRY              *
                               725 *   OF PRINTER COMMANDS AND PERFORMS A -EA- HALT. THE DATA SWITCHES            *
                               726 *   MUST THEN BE SET TO THE DESIRED ENTRY AND THE HALT RESET. AFTER            *
                               727 *   READING AND STORING THE SWITCHES, THE PROGRAM WILL HALT                    *
                               728 *   DISPLAYING -EC-.  REPEATED ENTRIES MAY BE MADE WITH ACCEPTANCE             *
                               729 *   BEING NOTED BY ALTERNATING HALT DISPLAYS OF-EA-AND-EC-.  THE               *
                               730 *   TWO TYPES OF DATA ENTRIES RECOGNIZED INCLUDE--                             *
                               731 *                                                                              *
                               732 *     1.  -QQCC-   WHERE QQ - Q CODE OF COMMAND.                               *
                               733 *                          CC - CONTROL CODE OF COMMAND.                       *
                               734 *                                                                              *
                               735 *     2.  -0XXX-             0 - POSITION OF SWITCH 1.                         *
                               736 *                          XXX - DELAY COUNT IN MILLISECONDS.                  *
                               737 *                                                                              *
                               738 *   END OF ENTRY IS SIGNALED BY -0000- IN THE SWITCHES.                        *
                               739 *                                                                              *
                               740 *   BEFORE EXECUTING THE STRING OF UP TO 20 ENTRIES, THE PROGRAM               *
                               741 *   PRINTS A LIST OF THE ENTRIES.                                              *
                               742 *                                                                              *
                               743 ********************************************************************************
  119D 0E              119D    744 RTNOE   DC    XL1'E'              ROUTINE NUMBER
  119E 80              119E    745         DC    XL1'80'             FLAGS - MANUAL INTERVENTION
  119F FFFF            11A0    746         DC    XL2'FFFF'           LAST ROUTINE IN SECTION
                               747 ********************************************************************************
  11A1 C0 87 021A              748         B     PRINT               PRINT INSTRUCTIONS
  11A5 41              11A5    749         DC    XL1'41'
```


E013 5203 LINE PRINTER FUNCTION TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  11A6 2E              11A6    750         DC    IL1'46'
  11A7 19AB            11A8    751         DC    AL2(INS1)
  11A9 E0EA            11AA    752         DC    XL2'E0EA'
  11AB C0 87 021A              753         B     PRINT
  11AF C5              11AF    754         DC    XL1'05'
  11B0 3A              11B0    755         DC    IL1'58'
  11B1 19E5            11B2    756         DC    AL2(INS2)
  11B3 C2 01 1F60              757         LA    ETABLE,XR1          LOAD TABLE ADDRESS
  11B7 3D 3F 11CB      11B8    758 ENTERO  CLI   ENTER1+2,X'3F'      WAS LAST HALT AN EA?
  11BB F2 01 C7                759         JNE   REDAS
  11BE 3C 6C 11CB              760         MVI   ENTER1+2,X'6C'      SET FOR EC HALT
  11C2 F2 87 04                761         J     ENTER1
  11C5 3C 3F 11CB              762 REDAS   MVI   ENTER1+2,X'3F'      SET FOR EA HALT
  11C9 F0 7C 00        11CC    763 ENTER1  HPL   X'C0',X'7C'         HALT
  11CC 70 00 01                764         SNS   1(,XR1),X'0'        READ DATA SWITCHES
  11CF 4D 01 01 1821           765         CLC   1(2,XR1),ZERO       BRANCH IF LAST ENTRY -0000-
  11D4 F2 81 58                766         JE    DOCMDS                TO EXECUTE THE STRING OF CMNDS
  11D7 79 F0 C0                767         TBF   0(,XR1),X'F0'       GO READ NEXT COMMAND IF THIS
  11DA F2 10 44                768         JT    NEXT                  IS DELAY ENTRY
  11DD 78 E0 00                769         TBN   0(,XR1),X'E0'       MAKE SURE DEVICE ADDRESS IS -E-
  11E0 F2 90 12                770         JF    BADCMD
  11E3 79 10 00                771         TBF   0(,XR1),X'10'
  11E6 F2 90 0C                772         JF    BADCMD
  11E9 79 05 00                773         TBF   0(,XR1),X'05'       BRANCH IF NOT SPACE OR PRINT/SPACE
  11EC F2 90 24                774         JF    CKSKIP
  11EF 7D 04 01                775         CLI   1(,XR1),X'04'       MAKE SURE THAT CONTROL CODE IS LESS
  11F2 F2 82 2C                776         JL    NEXT                THAN FOUR
  11F5 1C 01 1F97 01           777 BADCMD  MVC   CMDSAV(2),1(,XR1)   *INVALID COMMAND ENTRY
  11FA C0 87 021E              778         B     UNPACK              CONVERT ENTRY FOR PRINTING
  11FE 02              11FE    779         DC    IL1'2'
  11FF 1F97            1200    780         DC    AL2(CMDSAV)
  1201 19F3            1202    781         DC    AL2(INVC)
  1203 C0 87 021A              782         B     PRINT               PRINT ENTRY ERROR MSG E0-37
  1207 C5              1207    783         DC    XL1'C5'
  1208 0E              1208    784         DC    IL1'14'
  1209 19F3            120A    785         DC    AL2(INVC)
  120B E044            120C    786         DC    XL2'E044'
  120D F0 1B 1B                787         HPL   X'1B',X'1B'         '44'HALT ON ERROR
  1210 F2 87 18                788         J     WHIHLT              GO TRY AGAIN
  1213 79 01 C0        1216    789 CKSKIP  TBF   0(,XR1),X'01'       IF NOT SKIP MUST BE ENTRY ERROR
  1216 C0 90 11F5              790         BF    BADCMD
  121A 7D 7C 01                791         CLI   1(,XR1),X'70'       SKIP - NOT MORE THAN 112
  121D C0 84 11F5              792         BH    BADCMD
  1221 36 01 1825      1225    793 NEXT    A     TWO,XR1             INCREMENT TABLE POINTER
  1225 7D FF 02                794         CLI   2(,XR1),X'FF'       STOP ENTRY IF 20 HAVE BEEN MADE
  1228 F2 81 04                795         JE    DOCMDS
  122B C0 87 11B7              796 WHIHLT  B     ENTERO
  122F C0 87 021A              797 DOCMDS  B     PRINT               PRINT HEADING FOR LIST OF ENTRIES
  1233 41              1233    798         DC    XL1'41'
  1234 C7              1234    799         DC    IL1'7'
  1235 19FA            1236    800         DC    AL2(LIST)
  1237 E000            1238    801         DC    XL2'E000'
  1239 C2 01 1F60              802         LA    ETABLE,XR1          LOAD BASE ADDRESS
  123D 1C 01 1F97 01           803 GETNXT  MVC   CMDSAV(2),1(,XR1)   LOAD COMMAND FOR UNPACKING
  1242 36 01 1825              804         A     TWO,XR1             INCREMENT TABLE POINTER
  1246 C0 87 021E              805         B     UNPACK              CONVERT ENTRY FOR PRINTING
  124A 02              124A    806         DC    IL1'2'
  124B 1F97            124C    807         DC    AL2(CMDSAV)
  124D 19FE            124E    808         DC    AL2(ELIST)
  124F C0 87 021A              809         B     PRINT               PRINT OUT ENTRY
  1253 01              1253    810         DC    XL1'01'
  1254 04              1254    811         DC    IL1'4'
  1255 19FE            1256    812         DC    AL2(ELIST)
  1257 4D 01 01 1821           813         CLC   1(2,XR1),ZERO       CONTINUE IF NEXT ENTRY NOT -0000-
  125C C0 01 123D              814         BNE   GETNXT
  1260 C0 87 021A              815         B     PRINT               SPACE PRINTER
  1264 15              1264    816         DC    XL1'15'
  1265 C2 01 1F60              817 GOTHRU  LA    ETABLE,XR1          LOAD ADDRESS OF COMMAND TABLE
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1269 30 E0 1FA2            818         SNS   RICTR,X'E0'          SET EXPD LINE CNT.TO ACTUAL
   126D C0 87 12A3            819         B     CKCMD                GO EXECUTE STRING OF COMMANDS
   1271 C0 87 1265            820         B     GOTHRU
                              821
                              822 ********************************************************************
                              823 *     WAIT FOR M4      THEN DELAY SUBROUTINE                       *
                              824 ********************************************************************
   1275 34 08 12A2            825 M4DEL   ST    MEXIT+3,ARR          SET RETURN
   1279 30 E2 1F8F            826 GETIM   SNS   STAT2,X'E2'          GET TIMING
   127D 38 01 1F8F            827         TBN   STAT2,B'1'           HAMMERS IN M4
   1281 CC 90 1279            828         BF    GETIM
   1285 3C 28 1F9D            829         MVI   MSECS,X'28'          40 MSEC DELAY
   1289 0D FF 0800 0800       830 WAT     CLC   LPI(256),LPI         DELAY 1 MSEC.
   128F 0D 3B C8CC C800       831         CLC   LPI(60),LPI
   1295 0F 00 1F9D 1823       832         SLC   MSECS(1),ONE         DECR. DELAY COUNT
   129B CC 84 1289            833         BH    WAT
   129F C0 87 0000            834 MEXIT   B     *-*                  RETURN
                              835
                              836 *********                                          *********
                              837 * CKCMD ************************************************** CKCMD *
                              838 *********                                          *********
                              839 *                                                            *
                              840 *    SUBROUTINE ISSUES COMMANDS FROM TABLE IDENTIFIED BY XR1 UNTIL    *
                              841 *    ZERO ENTRY FOUND.  THE PRINT DATA FOR A PRINT COMMAND INCLUDES   *
                              842 *    AN INDICATION OF THE TYPE OF PRINT PLUS THE SPACE OR SKIP        *
                              843 *    OPERATIONS BETWEEN IT AND THE NEXT PRINT COMMAND.
                              844 *                                                            *
                              845 ********************************************************************
   12A3 34 08 12B3            846 CKCMD   ST    CCGO+3,ARR           SET UP RETURN ADDRESS
   12A7 3C FF 1FA0            847         MVI   LINOSA,X'FF'         ZERO LINE CTR. SAVE AREA
   12AB 4D 01 01 1821         848 CKDONE  CLC   1(2,XR1),ZERO        EXIT ROUTINE IF -0000- ENTRY
   12B0 C0 81 0000            849 CCGO    BE    *-*
   12B4 1C 01 13AF 01         850         MVC   DOXIO(2),1(,XR1)     SET UP EXECUTE I/O
   12B9 79 F0 00              851         TBF   0(,XR1),X'F0'        DO NOT EXECUTE COMMAND IF DELAY
   12BC F2 10 EB              852         JT    DOCMD
   12BF 78 02 00              853         TBN   0(,XR1),X'02'        BRANCH IF THIS IS NOT PRINT
   12C2 F2 90 E5              854         JF    DOCMD                 COMMAND
   12C5 3C 01 137D            855         MVI   SAVCMD+4,1
   12C9 1C 01 1F97 01         856         MVC   CMDSAV(2),1(,XR1)
   12CE 30 E0 1F8D            857         SNS   STATO,X'E0'          GRAB THE LINE COUNTERS
   12D2 38 80 C209            858         TBN   SBYTE1,SSW08         RIGHT CARR.
   12D6 F2 90 0B              859         JF    COLLIC
   12D9 C0 87 13B9            860         B     CVD                  CONVERT RIGHT LINE COUNTER
   12DD 1F8D          12DE    861         DC    AL2(STATO)           FROM
   12DF 186A          12E0    862         DC    AL2(DASH)            TO
                              863         J     SAMASH
   12E1 F2 87 08              864 COLLIC  B     CVD
   12E4 C0 87 13B9            865         DC    AL2(STATO-1)         PUT LINE NO. IN PRINTOUT
   12E8 1F8C          12E9    866         DC    AL2(DASH)            FROM
   12EA 186A          12EB    867 SAMASH  CLC   LICTR(1),LINOSA      TO
   12EC 0D 00 1FA1 1FA0       868         JNE   LALPD                LINE COUNTER NOT MOVED
   12F2 F2 01 07              869         CLI   FINDEX,X'E6'         PRINT AREA ADDR.FULL
   12F5 3D E6 1F99            870         JL    DNTRES
   12F9 F2 82 12              871 LALPD   LA    LPD+19,XR2           LOAD START ADDR.
   12FC C2 02 088F            872         MVC   0(2C,XR2),PRTOP      PUT LINE NO.&PRINT IN DATA FIELD
   1300 8C 13 00 1876         873         MVC   LINOSA(1),LICTR      SAVE PRINT LINE NO.
   1305 0C 00 1FA0 1FA1       874         J     COCOCO
   130B F2 87 C9              875 DNTRES  A     TWLVE,XR2            ADD 12 TO PRINT AREA ADDR<
   130E 36 02 182F            876         MVC   0(12,XR2),PRTOP
   1312 8C 0B CC 1876         877 COCOCO  MVI   SPMOVE+1,10          SET MOVE LENGTH TO 11
   1317 3C 0A 1348            878         MVI   SKMOVE+1,1C          SET MOVE LENGTH TO 11
   131B 3C 0A 1369            879 CCOCO   B     CVD                  CONVERT CONTROL CODE TO DEC.
   131F C0 87 13B9            880         DC    AL2(CMDSAV)          FROM
   1323 1F97          1324    881         DC    AL2(SKLINO)          TO
   1325 188E          1326    882         MVC   SPOP(1),SKLINO       MOVE COUNT INTO SPACE MSG. ALSO
   1327 0C 00 1882 188E       883         TBN   CMDSAV-1,X'04'
   132D 38 04 1F96            884         JT    ISSKIP
   1331 F2 10 30              885         CLC   CMDSAV(2),SPACE0-2   THIS A PRINT NO SPACE
   1334 0D 01 1F97 1FA9
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   133A F2 01 06              886         JNE   NOZO
   133D BC 40 00              887         MVI   0(,XR2),C' '          BLANK & SIGN
   1340 F2 87 30              888         J     INCCMD
   1343 36 02 182F            889 NOZO    A     TWLVE,XR2            ADD 12 TO PRINT AREA ADDR<
   1347 8C 0A 00 1882         890 SPMOVE  MVC   0(11,XR2),SPOP       PUT SPACE IN MSG
   134C 0E 00 1FA1 1F97       891         ALC   LICTR(1),CMDSAV        ADD SPACES TO LINE COUNT
   1352 0D 00 1FA1 1841       892         CLC   LICTR(1),FOLG          LINE COUNT UP TO 112
   1358 F2 04 18              893         JNH   INCCMD
   135B 0F 00 1FA1 1841       894         SLC   LICTR(1),FOLG        RESET COUNTER
   1361 F2 87 0F              895         J     INCCMD
   1364 36 02 182F            896 ISSKIP  A     TWLVE,XR2            ADD 12 TO PRINT AREA ADDR<
   1368 8C 0A 00 188E         897 SKMOVE  MVC   0(11,XR2),SKLINO       PUT SKIP IN
   136D CC 00 1FA1 1F97       898         MVC   LICTR(1),CMDSAV
   1373 0E 00 137D 1825       899 INCCMD  ALC   SAVCMD+4(1),TWO
   1379 1C 01 1F97 01         900 SAVCMD  MVC   CMDSAV(2),1(,XR1)       PICK UP NEXT COMMAND
   137E 34 02 1F99            901         ST    FINDEX,XR2             SAVE PRINT AREA ADDR.
   1382 0D 01 1F97 1821       902         CLC   CMDSAV(2),ZERO         GO DO XIO IF THIS IS LAST
   1388 F2 81 1F              903         JE    DOCMD                   COMMAND IN TABLE
   138B 39 F0 1F96            904         TBF   CMDSAV-1,X'F0'       BRANCH IF THIS IS DELAY ENTRY
   138F C0 10 1373            905         BT    INCCMD
   1393 38 02 1F96            906         TBN   CMDSAV-1,X'02'       GO EXECUTE STRING OF COMMANDS IF
   1397 F2 10 1C              907         JT    DOCMD                   THIS IS PRINT
   139A 3C 0B 1348            908         MVI   SPMOVE+1,11          SET MOVE LENGTH TO 12
   139E 3C 0B 1369            909         MVI   SKMOVE+1,11          SET MOVE LENGTH TO 12
   13A2 3D F0 1F99            910         CLI   FINDEX,X'F0'         PRINT AREA ADDR.ALMOST FULL
   13A6 C0 82 131F            911         BL    OCOCO
   13AA C0 87 1432            912 DOCMD   B     XIO                  GO ISSUE COMMAND
   13AE 0000          13AF    913 DOXIO   DC    XL2'0'
                              914         A     TWO,XR1              INCREMENT TO NEXT COMMAND
                              915         B     CKDONE               GO LOOK AT NEXT COMMAND
                              916
                              917 ********************************************************************
                              918 *       CONVERT 1 HEX BYTE TO ZONED DECIMAL SUBROUTINE
                              919 ********************************************************************
   13B8 00            13B8    920 HXBYT   DC    XL1'00'
   13B9 36 08 1823            921 CVD     A     ONE,ARR              ADD 1 TO GET 1ST PARAMETER
   13BD 34 08 13CA            922         ST    FROM+5,APR           INSERT THE FROM ADDR.
   13C1 36 08 1825            923         A     TWO,ARR              ADD 2 GET 2ND PARAMETER
   13C5 34 08 13E0            924         ST    TYBOT+5,ARR          INSERT THE TO ADDR.
   13C9 34 08 13E6            925         ST    OTORZ+5,ARR          INSERT THE TO ADDR.
   13CD 36 08 1823            926         A     ONE,ARR              ADD 1 MORE FER RETURN ADDR.
   13D1 34 08 1409            927         ST    TIXE+3,ARR           SET RETURN ADDR.
   13D5 0C 01 13EC 0000       928 FROM    MVC   FROBYT+5(2),*-*
   13DB 0C 01 13FF 0000       929 TYBOT   MVC   TOBYT+3(2),*-*
   13E1 0C 01 13F0 0000       930 OTORZ   MVC   ZROTO+3(2),*-*
   13E7 CC 00 13B8 0000       931 FROBYT  MVC   HXBYT(1),*-*         PUT BYTE IN WORK AREA
   13ED 04 20 0000 1851       932 ZROTO   PAZ   *-*(3),DECZRO(1)     ZERO THE TO AREA
   13F3 0F 00 13B8 1823       933 DECGAN  SLC   HXBYT(1),ONE         DECREMENT THE HEX BYTE
   13F9 F2 82 0A              934         JL    TIXE                 EXIT IF BELOW 1
   13FC 06 20 0000 1852       935 TOBYT   AZ    *-*(3),DECONE(1)     INCREMENT THE DEC. COUNT
   1402 C0 87 13F3            936         B     DECGAN
   1406 C0 87 0000            937 TIXE    B     *-*                  RETURN
                              938
                              939 ********************************************************************
                              940 *          CHECK FOR BUSY AND DELAY SUBROUTINE                     *
                              941 ********************************************************************
   140A 34 08 1431            942 BROUT   ST    BSEXIT+3,ARR         LOAD RETURN ADDR.
   140E 0C 02 1FA5 183B       943 SDC     MVC   BUSUB(3),BUSCTI      STORE DELAY COUNT
   1414 0F 02 1FA5 1823       944 FLOOP   SLC   BUSUB(3),ONE
   141A F2 81 07              945         JZ    TOLONG               TRY FOR 7.5 SEC.
   141D C1 E6 1414            946         TIO   FLOOP,BUSY           TO CLEAR
   1421 F2 87 0A              947         J     BSEXIT               BUSY
   1424 C0 87 0222            948 TOLONG  B     HALT
   1428 E011          1429    949         DC    XL2'E011'
   142A C0 87 140E            950         B     SDC
   142E C0 87 0000            951 BSEXIT  B     *-*                  RETURN
                              952 *******                                          *******
                              953 * XIO ************************************************** XIO *
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                954 *******                                                       *******
                                955 *                                                                   *
                                956 *   THIS ROUTINE ISSUES AND CHECKS AN EXECUTE I/O COMMAND AS         *
                                957 *   SELECTED BY THE MAINLINE PROGRAM.  LINKAGE TO THIS SUBROUTINE    *
                                958 *   IS AS FOLLOWS-                                                  *
                                959 *                                                                   *
                                960 *       B      XIO                                                  *
                                961 *       DC     2,X'Q CODE & CONTROL CODE OF COMMAND'                *
                                962 *                                                                   *
                                963 *********************************************************************
    1432 0C 01 14C2 1858        964 XIO    MVC   FRMLE+3(2),ADFOLG       PUT IN 112 FORM LENGTH ADDR.
    1438 36 08 1823             965 SKIXIO A     ONE,ARR
    143C 34 08 1455             966        ST    LDCMD+5,ARR             LOAD PARAMETER POINTER
    1440 36 08 1823             967        A     ONE,ARR
    1444 34 08 164F             968        ST    EXIT+3,ARR              SET UP EXIT
    1448 34 01 1651             969        ST    SAVWUN,XR1              SAVE REG. 1
    144C 34 02 1653             970        ST    SAVTUU,XR2              SAVE REG.2
    1450 0C 01 150F 0000        971 LDCMD  MVC   CMND+2(2),*-*           SET UP COMMAND FROM PARAMETER
    1456 0C 01 1F9D 150F        972        MVC   MSECS(2),CMND+2         IF ENTRY IS -0XXX-, GO DELAY
    145C 39 F0 150E             973        TBF   CMND+1,X'FC'
    1460 F2 10 19               974        JT    WT
    1463 38 40 020A             975        TBN   SBYTE2,SSW11            BRANCH IF SSW11 OFF
    1467 F2 90 03               976        JF    CSSWOA
    146A F0 7C 1B               977        HPL   X'1B',X'7C'             HALT ON E4
    146D 38 20 020A             978 CSSWOA TBN   SBYTE2,SSW12            DELAY BETWEEN CMDS.
    1471 F2 90 26               979        JF    TIOCHK
    1474 30 00 1F9D             980        SNS   MSECS,X'0'              READ DATA SWITCHES FOR DELAY
    1478 3B F0 1F9C             981        SBF   MSECS-1,X'F0'           TURN OFF HIGH ORDER 4 BITS OF DELAY
    147C 0C FF 0800 0800        982 WT     CLC   LPI(256),LPI            1 MILLISECOND DELAY
    1482 0C 3B 0800 0800        983        CLC   LPI(60),LPI
    1488 0F 01 1F9D 1823        984        SLC   MSECS,ONE(2)            DO FOR DESIRED NUM OF MILLISECS
    148E C0 84 147C             985        BH    WT
    1492 39 F0 150E             986        TBF   CMND+1,X'F0'            DO NOT EXECUTE COMMAND IF DELAY
    1496 C0 10 1644             987        BT    XIOEXT
    149A C1 E0 14A1             988 TIOCHK TIO   ERNRDY,NRDY             BRANCH IF NOT READY
    149E F2 87 12               989        J     SIOOK
    14A1 C0 87 1656             990 ERNRDY B     STERR                   BR TO CHECK STATUS
    14A5 C0 87 1732             991        B     PSTERR                  GO PRINT STATUS OR 1ST LINES
    14A9 C0 87 0222             992        B     HALT                   *PRINTER NOT READY
    14AD E010            14AE   993        DC    XL2'E010'               NOT READY ID.
    14AF C0 87 149A             994        B     TIOCHK
    14B3 C0 87 140A             995 SIOOK  B     BROUT
    14B7 31 E4 1846             996        LIO   LPIADR,LPIAR            LOAD LSR ADDRESS REGISTER
    14BB 31 E6 184A             997        LIO   LPDADR,LPDAR
    14BF 31 E0 0000             998 FRMLE  LIO   *-*,LOFCLG                     LOAD FORMS LENGTH
    14C3 38 80 0209             999        TBN   SBYTE1,SSW08            PRINT ON RIGHT CARR.
    14C7 F2 90 04              1000        JF    NOTRIT                  JUMP IF NOT
    14CA 3A 08 150E            1001        SBN   CMND+1,B'1000'          SET MOD.BIT
    14CE 0C 01 1F91 150F       1002 NOTRIT MVC   ERT1(2),CMND+2
    14D4 38 08 150E            1003        TBN   CMND+1,B'1000'          THIS CMD.FOR RIGHT CARR.
    14D8 F2 90 11              1004        JF    SKRICA                  SKIP TO SET LEFT CARR.
    14DB 3C EC 15B1            1005        MVI   CABY+1,RICABY           SET TO CHECK RIGHT CARR.BUSY
    14DF 3C E8 1FAA            1006        MVI   SPACE0-1,X'E8'          SET RIGHT CARR.SPACE 0
    14E3 0C 01 1528 1860       1007        MVC   LICDSA+5(2),STOAD       PUT RIGHT CARR.CTR.IN COMPARE
    14E9 F2 87 21              1008        J     CMND
    14EC 3C E4 15B1            1009 SKRICA MVI   CABY+1,CABUSY           SET TO CHECK LEFT CARR.BUSY
    14F0 3C E0 1FAA            1010        MVI   SPACE0-1,X'E0'          SET LEFT CARR.SPACE 0
    14F4 0C 01 1528 1862       1011        MVC   LICDSA+5(2),STOM1       PUT LEFT  CARR.CTR.IN COMPARE
    14FA 3D 09 0A03            1012        CLI   RNUM,X'C9'              IS THIS H&T PRINT ROUTINE
    14FE F2 01 CC              1013        JNE   CMND
    1501 30 E2 1F8F            1014 WAHOL  SNS   STAT2,X'E2'             GRAB TIMINGS
    1505 38 01 1F8E            1015        TBN   STAT2-1,B'1'            WAIT FOR HOME LATCH
    1509 C0 90 1501            1016        BF    WAHOL
    150D F3 00 00              1017 CMND   SIO   X'0',X'C'               COMMAND LOADED DURING EXECUTION
    1510 0C 01 18D1 18DD       1018        MVC   MAP(2),CHT17            PUT CHART NO. IN MSG.
    1516 0D 01 150F 1FAB       1019        CLC   CMND+2(2),SPACE0        DO NOT CHECK FOR BUSY IF THIS WAS
    151C F2 81 54              1020        JE    ISBUSY                   SPACE WITH ZERO CONTROL CODE
    151F 30 E0 1F8D            1021        SNS   STAT0,X'E0'             GRAB THE LINE CTRS.
```



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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    1523 0D 00 150F 0000       1022 LICDSA CLC   CMND+2(1),*-*           LINE CTR.SAME AS CMD.C.C.
    1529 F2 81 47              1023        JE    ISBUSY
    152C C1 E6 1573            1024        TIO   ISBUSY,BUSY             PRINTER SHOULD BE BUSY
    1530 3A 01 1F8B            1025        SBN   TAGS,TAG7               SET 1ST LINE PRINT ONLY
    1534 0C 00 1780 1553       1026        MVC   HLTID(1),NOBALT         PUT HALT ID IN MSG
    153A C0 87 172E            1027        B     ASTERR                  GO PRINT STATUS
    153E C0 87 021A            1028        B     PRINT                   PRINT NOT BUSY MSG
    1542 81              1542  1029        DC    XL1'81'
    1543 1D              1543  1030        DC    IL1'29'
    1544 1B37            1545  1031        DC    AL2(NOBUSY)
    1546 C0 87 021A            1032        B     PRINT                   PRINT PRINTER MAP CHART NO.
    154A 85              154A  1033        DC    XL1'85'
    154B CA              154B  1034        DC    IL1'10'
    154C 1BD1            154D  1035        DC    AL2(MAP)
    154E C0 87 0222            1036        B     HALT                   *IF NOT, HALT ON ERROR
    1552 E016            1553  1037 NOBALT DC    XL2'E016'               NOT BUSY HALT
    1554 38 10 020A            1038        TBN   SBYTE2,SSW13            SSW- 13 ON (NO ALT.PRTR.) ?
    1558 F2 90 18              1039        JF    ISBUSY
    155B 0C 00 1566 1F90       1040        MVC   CMODE(1),ERT1-1          SET CMD.CODE IN HALT
    1561 C0 87 0222            1041        B     HALT                     DISPLAY CMD.CODE
    1565 E000            1566  1042 CMODE  DC    XL2'E000'
    1567 0C 00 1572 1F91       1043        MVC   CNCO(1),ERT1             SET CONTROL CODE IN HALT
    156D C0 87 0222            1044        B     HALT                     DISPLAY CONTROL CODE
    1571 E000            1572  1045 CNCO   DC    XL2'E000'
    1573 0C 02 1FA5 1838       1046 ISBUSY MVC   BUSUB(3),BUSCT
    1579 0C 01 15D4 185A       1047        MVC   DELAY+3(2),ADBUBY       PUT IN LOOP ADDR.
    157F 3C 12 1600            1048        MVI   BUALT,X'12'             SET BUFFER BUSY ID
    1583 0C 07 1B44 1B6A       1049        MVC   BUMSG(8),BUFF           MOVE BUFFER MSG
    1589 C1 E2 15CB            1050 BUBY   TIO   BSYLP,PBBUSY            PRINT BUFF BUSY
    158D 3D 0C 0A03            1051        CLI   RNUM,X'0C'              THIS THE RIPPLE PRINT ROUT.
    1591 F2 01 08              1052        JNE   SKIDO
    1594 6C 5F 5F 5F           1053 FRSMV  MVC   95(96,XR1),95(,XR2)     RIPPLE MOVE 96,120,OR 132 CHAR.INTO
    1598 6C 00 00 60           1054 SNDMV  MVC   0(1,XR1),96(,XR2)         THE DATA AREA FROM PFIELD
    159C C0 87 0212            1055 SKIDO  B     TEST                    GO READ DATA SWITCHES
    15A0 0C 01 15D4 185C       1056        MVC   DELAY+3(2),ADCABY       PUT IN LOOP ADDR.
    15A6 3C 13 1600            1057        MVI   BUALT,X'13'             SET CARR.HALT ID
    15AA 0C 07 1B44 1B5A       1058        MVC   BUMSG(8),CARR           MOVE CARR.MSG
    15B0 C1 00 15CB            1059 CABY   TIO   BSYLP,*-*               CARRIAGE BUSY
    15B4 0C 01 15D4 185E       1060        MVC   DELAY+3(2),ADPIBY       PUT IN LOOP ADDR.
    15BA 3C 14 1600            1061        MVI   BUALT,X'14'             SET PRINTER BUSY HALT ID
    15BE 0C 07 1B44 1B62       1062        MVC   BUMSG(8),PRIN           MOVE PRINTER BUSY MSG
    15C4 C1 E6 15CB            1063 PIBY   TIO   BSYLP,BUSY              PRINTER BUSY
    15C8 F2 87 36              1064        J     CHRDY
    15CB 0F 02 1FA5 1823       1065 BSYLP  SLC   BUSUB(3),ONE            TRY FOR ABOUT  3  SECONDS TO
    15D1 C0 01 0000            1066 DELAY  BNZ   *-*                      CLEAR BUSY
    15D5 C0 87 1656            1067        B     STERR                   CHECK FOR STATUS ERROR
    15D9 C0 87 1609            1068        B     SDEHF
    15DD 3A 01 1F8B            1069        SBN   TAGS,TAG7               SET PRINT 1ST LINES ONLY FLAGS
    15E1 0C 00 1780 1600       1070        MVC   HLTID(1),BUALT          PUT HALT ID IN MSG
    15E7 C0 87 1732            1071        B     PSTERR                  GO PRINT STATUS OR 1ST LINES
    15EB C0 87 021A            1072        B     PRINT                   PRINT BUSY MSG
    15EF 81              15EF  1073        DC    XL1'81'
    15F0 1B              15F0  1074        DC    IL1'27'
    15F1 1B52            15F2  1075        DC    AL2(BUTOLO)
    15F3 C0 87 021A            1076        B     PRINT                   PRINT PRINTER MAP CHART NO.
    15F7 85              15F7  1077        DC    XL1'85'
    15F8 CA              15F8  1078        DC    IL1'10'
    15F9 1BD1            15FA  1079        DC    AL2(MAP)
    15FB C0 87 0222            1080        B     HALT                    BUSY HALT
    15FF E000            1600  1081 BUALT  DC    XL2'E000'
    1601 C1 E0 163C            1082 CHRDY  TIO   NRDYER,NRDY
    1605 C0 87 1656            1083        B     STERR                   BR TO CHECK ERR STATUS
    1609 C0 87 1732            1084 SDEHF  B     PSTERR                  GO PRINT STATUS OR 1ST LINES
    160D 3D 0D 0A03            1085        CLI   RNUM,X'CD'              IN UNPRTABLE CHAR TEST
    1611 F2 81 3C              1086        JE    XIOEXT                  YES , GET OUT
    1614 38 02 1F93            1087        TBN   STAT6,B'10'             UNPRTABLE BIT ON
    1618 F2 90 29              1088        JF    XIOEXT
    161B C0 87 021A            1089        B     PRINT                   PRINT UNPRTABLE CHAR SKIPPED
```

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ERR LCC OBJECT CCDE       ADDR STMT SOURCE STATEMENT

    161F C1               161F 1090        DC     XL1'C1'
    1620 1D               1620 1091        DC     IL1'29'
    1621 1950             1622 1092        DC     AL2(DEPP)
    1623 E00C             1624 1093        DC     XL2'ECOC'             UNPRTABLE CHAR HALT
    1625 CC 01 18D1 18DB       1094        MVC    MAP(2),CHT16          PUT CHART NO.IN MSG.
    1628 CC 87 021A            1095        B      PRINT                 PRINT PRINTER MAP CHART NO.
    162F 85               162F 1096        DC     XL1'85'
    1630 0A               1630 1097        DC     IL1'10'
    1631 18D1             1632 1098        DC     AL2(MAP)
    1633 C0 87 C222            1099        B      HALT                  *UNPRINTABLE CHAR SKIPPED BIT ON
    1637 E00C             1638 1100        DC     XL2'E00C'             UNPRTABLE CHAR HALT
    1639 F2 87 08              1101        J      XIOEXT
    163C C0 87 1656            1102 NRDYER B      STERR                 BR TO CHECK ERR STATUS
    1640 C0 87 1732            1103        B      PSTERR                GO PRINT STATUS OR 1ST LINES
    1644 35 01 1651            1104 XIOEXT L      SAVWUN,XR1            RESTORE REG.1
    1648 35 02 1653            1105        L      SAVTUU,XR2            RESTORE REG.2
    164C C0 87 0000            1106 EXIT   B      *-*                   EXIT SUBROUTINE
    165C 0000             1651 1107 SAVWUN DC     IL2'0'
    1652 0000             1653 1108 SAVTUU DC     IL2'0'
                               1109
                               1110 *********                                                            *********
                               1111 * STERR ********************************************************* STERR *
                               1112 *********                                                            *********
                               1113 *                                                                            *
                               1114 *     CHECK FOR STATUS ERROR
                               1115 *                                                                            *
                               1116 **************************************************************************
    1654 0000             1655 1117 STSA1  DC     XL2'0'
                               1118
    1656 34 08 1720            1119 STERR  ST     STEXIT+3,ARR          LOAD RETURN ADDRESS
    165A 34 01 1655            1120        ST     STSA1,XR1             SAVE REG. 1
    165E 3C E3 1F93            1121        SNS    STAT6,X'E3'           SENSE THE STATUS BYTES
    1662 39 F6 1F92            1122        TBF    STAT6-1,B'11110110'   ANY STATUS ERRS IN EB2
    1666 F2 90 07              1123        JF     YESER
    1669 39 E0 1F93            1124        TBF    STAT6,B'11100000'     ANY ERRS IN EB1
    166C F2 10 80              1125        JT     FOADD
    1670 38 02 1F88            1126 YESER  SBF    TAGS,TAG6             SET ERR INDICATOR OFF
    1674 C2 01 1A4C            1127        LA     STATAB-19,XR1         LOAD TABLE ADDR.
    1678 D2 01 13              1128 NOERR  LA     19(,XR1),XR1          ADD 19
    167B 7D FF 00              1129        CLI    0(,XR1),X'FF'         ALL MASKS CHECKED
    167E F2 81 9F              1130        JE     FOADD
    1681 1C 00 168C 00         1131        MVC    STECK1+1,0(1,XR1)     PUT ERR MASK IN EB2 BYTE
    1686 1C 00 169C 01         1132        MVC    STECK2+1,1(1,XR1)     PUT ERR MASK IN EB1 BYTE
    1688 39 00 1F92            1133 STECK1 TBF    STAT6-1,*-*           CHECK EB2 BYTE
    168F 39 00 1F93            1134 STECK2 TBF    STAT6,*-*             CHECK EB1 BYTE
    1693 C0 10 1678            1135        PT     NCERR
    1697 1C 00 1780 02         1136        MVC    HLTID(1),2(,XR1)      PUT HALT CODE IN MSG.
    169C 1C 0F 1A5E 12         1137        MVC    IBEP(16),18(,XR1)     PUT NAME IN MSG.
    16A1 3A 02 1F88            1138        SBN    TAGS,TAG6             SET ERR INDICATOR ON
    16A5 30 E6 1F95            1139        SNS    STAIX,X'E6'           GRAB LPDAR
    16A9 0D 01 1F95 184A       1140        CLC    STAIX(2),LPDADR       D.A.R. ADDR. TOO LOW
    16AF F2 82 09              1141        JL     DABOT
    16B2 0D 01 1F95 184C       1142        CLC    STAIX(2),DADEND       D.A.R. ADDR. TOO HIGH
    16B8 F2 04 09              1143        JNH    SABTR
    16BB 0C 04 181A 19EA       1144 DABOT  MVC    HANO(5),INVC-9        PUT INVALID IN MSG.
    16C1 F2 87 62              1145        J      RESTO
    16C4 0F 00 1F95 1844       1146 SABTR  SLC    STAIX(1),ONTUTR       SUBTR.TO GET PRINT POS.
    16CA 3D 18 1F95            1147        CLI    STAIX,X'18'           PRT.POS. 24 OR LESS
    16CE F2 84 27              1148        JH     GODEC
    16D1 3D 10 1F95            1149        CLI    STAIX,X'10'           PRT.POS. 16
    16D5 F2 84 17              1150        JH     AD107                 GO ADD 107 IF HIGHER
    16D8 30 0D 1F95            1151        CLI    STAIX,X'0D'           PRT.PCS. 13
    16DC F2 02 07              1152        JNL    AD119                 GO ADD 119 IF EQUAL OR HIGH
    16DF 3D 04 1F95            1153        CLI    STAIX,X'04'           PRT.POS. 4
    16E3 F2 84 09              1154        JH     AD107                 GO ADD 107 IF HIGHER
    16E6 CE 00 1F95 1843       1155 AD119  ALC    STAIX(1),UNITIN       ADD 119
    16EC F2 87 0F              1156        J      DIVID
    16EF 0E 00 1F95 1842       1157 AD107  ALC    STAIX(1),UNOSVN       ADD 107
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    16F5 F2 87 06              1158        J      DIVID
    16F8 0F 00 1F95 1833       1159 GODEC  SLC    STAIX(1),TWYWUN       DECREMENT 21 PRINT POSITIONS
    16FE 3C 00 1F94            1160 DIVID  MVI    STAIX-1,X'00'
    1702 CF 00 1F95 1829       1161 SUBGAN SLC    STAIX(1),FOUR         DIVIDE
    1708 F2 82 0A              1162        JL     AWDUN                 BY
    1708 0E 00 1F94 1823       1163        ALC    STAIX-1(1),ONE        FOUR
    1711 C0 87 1702            1164        B      SUBGAN
    1715 C0 87 1389            1165 AWDUN  B      CVD                   MAKE HAMMER NO.PRINABLE
    1719 1F94             171A 1166        DC     AL2(STAIX-1)          FROM
    1718 181A             171C 1167        DC     AL2(HANO)             TO
    171D F2 87 C6              1168        J      RESTO
    1720 0E 01 172D 1829       1169 FOADD  ALC    STEXIT+3(2),FOUR      ADD TO RETURN ADDR.
    1726 35 01 1655            1170 RESTO  L      STSA1,XR1             RESTORE REG. 1
    172A C0 87 C000            1171 STEXIT B      *-*                   EXIT
                               1172
                               1173 *************************************************************************
                               1174 *     PRINT STATUS ERR AND EXECUTE HALT SUBROUTINE
                               1175 *************************************************************************
    172E 30 E3 1F93            1176 ASTERR SNS    STAT6,X'E3'           GET STATUS
    1732 34 08 181F            1177 PSTERR ST     PREXIT+3,ARR          SET RETURN ADDR.
    1736 0C 04 1A11 1874       1178        MVC    NACMD(5),TFEL         PUT LEFT IN MSG.
    173C 38 08 1F90            1179        TBN    ERT1-1,B'1000'        WAS CMD.TO RIGHT CARR.
    1740 F2 90 06              1180        JF     SKRIG
    1743 0C 04 1A11 186F       1181        MVC    NACMD(5),THGIR        PUT RIGHT IN MSG.
    1749 C0 87 1389            1182 SKRIG  B      CVD                   CONVERT CONTROL CODE TO DEC.
    174D 1F91             174E 1183        DC     AL2(ERT1)
    174F 18B3             1750 1184        DC     AL2(DSKPOP)
    1751 0C 00 18A5 18B3       1185        MVC    POPSUD(1),DSKPOP      PUT CC INTO SPACE MSG.ALSO
    1757 0C 10 1A23 18A8       1186        MVC    LACMND(17),DUSPOP     PUT PRINT&SPACE IN MSG.
    175D 38 02 1F90            1187        TBN    ERT1-1,B'10'          THIS A PRINT
    1761 F2 10 06              1188        JT     SEIFSK
    1764 0C 05 1A18 1A29       1189        MVC    LACMND-11(6),KNALB    BLANK OUT PRINT
    176A 38 04 1F90            1190 SEIFSK TBN    ERT1-1,B'100'         THIS A SKIP
    176E F2 90 06              1191        JF     GOMOST
    1771 0C 0A 1A23 18B3       1192        MVC    LACMND(11),DSKPOP     PUT SKIP IN MSG<
    1777 C0 87 021A            1193 GOMOST B      PRINT                 PRINT LAST CMD.ISSUED
    177B C1               177B 1194        DC     XL1'C1'
    177C 25               177C 1195        DC     IL1'37'
    177D 1A23             177E 1196        DC     AL2(LACMND)
    177F E000             1780 1197 HLTID  DC     XL2'E000'
    1781 C0 87 021E            1198        B      UNPACK                MAKE STATUS PRINABLE
    1785 02               1785 1199        DC     IL1'2'
    1786 1F93             1787 1200        DC     AL2(STAT6)            FROM
    1788 1A3A             1789 1201        DC     AL2(YBATS)            TO
    178A C0 87 021A            1202        B      PRINT                 PRINT STATUS BYTES
    178E 81               178E 1203        DC     XL1'81'
    178F 11               178F 1204        DC     IL1'17'
    1790 1A3A             1791 1205        DC     AL2(YBATS)
    1792 38 01 1F8B            1206        TBN    TAGS,TAG7             1ST LINE ONLY PRINTED
    1796 F2 10 7F              1207        JT     TESER
    1799 C0 87 021A            1208        B      PRINT                 PRINT PRIORITY ERR STAT.
    179D 81               179D 1209        DC     XL1'81'
    179E 24               179E 1210        DC     IL1'36'
    179F 1A5E             17A0 1211        DC     AL2(IBEP)
    17A1 39 C0 1F93            1212        TBF    STAT6,B'11000000'     CHAIN SYNC & INCR SYNC OFF
    17A5 F2 90 1C              1213        JF     DOHALT                *
    17A8 39 10 1F92            1214        TBF    STAT6-1,B'10000'      INCR.FAILURE CHK. OFF
    17AC F2 90 15              1215        JF     DOHALT
    17AF 38 04 1F92            1216        TBN    STAT6-1,B'100'        HAMMER ECHO CHK.
    17B3 F2 90 0E              1217        JF     DOHALT
    17B6 C0 87 021A            1218        B      PRINT                 PRINT HAMMER NO.
    17BA 81               17BA 1219        DC     XL1'81'
    17BB 10               17BB 1220        DC     IL1'16'
    17BC 181A             17BD 1221        DC     AL2(HANC)
    17BE 0C 01 1817 1A29       1222        MVC    HAMNO(2),KNALB        BLANK OUT 'I', 'N' JUST IN CASE
    17C4 CC 01 18D1 1805       1223 DOHALT MVC    MAP(2),CHT11          PUT CHART NO. IN MSG.
    17CA CC 87 021A            1224        B      PRINT                 PRINT PRINTER MAP CHART NO.
    17CE 81               17CE 1225        DC     XL1'81'
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   17CF 0A               17CF 1226         DC    IL1'10'
   17D0 1681             17D1 1227         DC    AL2(MAP)
   17D2 C0 87 021A             1228         B     PRINT
   17D6 15               17D6 1229         DC    XL1'15'
   17D7 0C 01 17E2 1780        1230         MVC   PUIDIN(2),HLTID
   17DD CC 87 C222             1231         B     HALT
   17E1 E000             17E2 1232 PUIDIN  DC    XL2'E000'
   17E3 38 10 020A             1233         TBN   SBYTE2,SSW13
   17E7 F2 90 2E               1234         JF    TESER
   17EA 38 04 1F92             1235         TBN   STAT6-1,B'100'
   17EE F2 90 27               1236         JF    TESER
   17F1 3C 0A 17F6             1237         MVI   BUTIN+1,X'0A'
   17F5 3D 0A 1F94             1238 BUTIN   CLI   STAIX-1,X'0A'
   17F9 F2 82 1C               1239         JL    MOWIT
   17FC 0E 00 1F94 182A        1240         ALC   STAIX-1(1),SIX
   1802 0E 00 17F6 182D        1241         ALC   BUTIN+1(1),XTEN
   1808 C0 87 17F5             1242         B     BUTIN
   180C 0C 00 1817 1F94        1243 MOWIT   MVC   MLESID(1),STAIX-1
   1812 C0 87 0222             1244         B     HALT
   1816 E000             1817 1245 MLESID  DC    XL2'E000'
   1818 38 01 1F8B             1246 TESER   SBF   TAGS,TAG7
   181C C0 87 0000             1247 PREXIT  B     *-*
```

```
SPACE 5

PUT ID INTO HALT
*STATUS ERROR HALTS

SSW -13 ON(NO ALT.PRTR.) ?

HMR.ECHO CHK.?

 PUT
  HAMMER
    NUMBER
      INTO
        THE
          HALT
            LIGHTS
DISPLAY HAMMER NO.

RESET 1ST LINE ONLY FLAG
RETURN
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               1249 *************
                               1250 * CONSTANTS ***************************************************************
                               1251 *************
   1820 0000             1821 1252 ZERO    DC    IL2'0'
   1822 0001             1823 1253 ONE     DC    IL2'1'
   1824 0002             1825 1254 TWO     DC    IL2'2'
   1826 0003             1827 1255 TREE    DC    IL2'3'
   1828 0004             1829 1256 FOUR    DC    IL2'4'
   182A 06               182A 1257 SIX     DC    IL1'6'
   182B 0008             182C 1258 EIGHT   DC    IL2'8'
   182D 10               182D 1259 XTEN    DC    XL1'10'
   182E 000C             182F 1260 TWLVE   DC    IL2'12'
   1830 0011             1831 1261 SVNTEN  DC    IL2'17'
   1832 0015             1833 1262 TWYWUN  DC    IL2'21'
   1834 001A             1835 1263 TWYSIX  DC    IL2'26'
   1836 C18800           1838 1264 BUSCT   DC    XL3'18800'
   1839 040000           183B 1265 BUSCTI  DC    XL3'40000'
   183C 2A2A             183D 1266 FL42    DC    XL2'2A2A'       FORM LENGTH 42
   183E 5555             183F 1267 FL85    DC    XL2'5555'       FORM LENGTH 85
   1840 7070             1841 1268 FOLG    DC    XL2'7070'       FORM LENGTH 112
   1842 6B               1842 1269 UNOSVN  DC    IL1'107'
   1843 77               1843 1270 UNITIN  DC    IL1'119'
   1844 7B               1844 1271 ONTUTR  DC    IL1'123'
   1845 0800             1846 1272 LPIADR  DC    XL2'800'        IMAGE ADDR.
   1847 082F             1848 1273 TUFORF  DC    XL2'82F'
   1849 087C             184A 1274 LPDADR  DC    XL2'87C'        DATA ADDR.
   184B 08FF             184C 1275 DADEND  DC    XL2'8FF'
   184D 1F00             184E 1276 SIADD   DC    XL2'1F00'
   184F 1D4C             1850 1277 SFHU    DC    IL2'7500'
   1851 F0               1851 1278 DECZRO  DC    DL1'0'
   1852 F1               1852 1279 DECONE  DC    DL1'1'
   1853 183D             1854 1280 ADFL42  DC    AL2(FL42)
   1855 183F             1856 1281 ADFL85  DC    AL2(FL85)
   1857 1841             1858 1282 ADFOLG  DC    AL2(FOLG)
   1859 1589             185A 1283 ADBUBY  DC    AL2(BUBY)
   1858 1580             185C 1284 ADCABY  DC    AL2(CABY)
   185D 15C4             185E 1285 ADPIBY  DC    AL2(PIBY)
   185F 1F8D             1860 1286 STOAD   DC    AL2(STATO)      RIGHT CARR.CTR.ADDR.
   1861 1F8C             1862 1287 STOM1   DC    AL2(STATO-1)    LEFT CARR.CTR.ADDR.
                               1288
                               1289 *************
                               1290 * PRINTOUTS ***************************************************************
                               1291 *************
   1863 D3C9D5C5         1866 1292         DC    CL4'LINE'
   1867 404040           1869 1293         DC    CL3'   '
   186A 40               186A 1294 DASH    DC    CL1' '
   186B 614040D7D9C9D5E3 1876 1295 PRTOP   DC    CL12'/  PRINT   &'
   1873 40404050               1295
   1877 614040E2D7C1C3C5 1882 1296 SPOP    DC    CL12'/  SPACE    '
   187F 40404040               1296
   1883 61E2D2C9D740E3D6 188C 1297         DC    CL10'/SKIP TO  '
   188B 4040                   1297
   188D 4040             188E 1298 SKLINO  DC    CL2'  '
   188F D3C9D5C540       1893 1299         DC    CL5'LINE '
   1894 404040           1896 1300         DC    CL3'   '
   1897 61D7D9C9D5E350   189D 1301         DC    CL7'/PRINT&'
   189E E2D7C1C3C540     18A3 1302         DC    CL6'SPACE '
   18A4 4040             18A5 1303 POPSUD  DC    CL2'  '
   18A6 404040           18A8 1304 DUSPOP  DC    CL3'   '
   18A9 E2D2C9D740E3D6   18AF 1305         DC    CL7'SKIP TO'
   18B0 40404040         18B3 1306 DSKPGP  DC    CL4'    '
   18B4 D5D640E2E3C1E3E4 18C6 1307         DC    CL19'NO STATUS CHK.BUT '
   18BC E240C3C8D24BC2E4       1307
   18C4 E34040                 1307
   18C7 404040404040     18CC 1308 WICH    DC    CL6'      '
   18CD C3C1D9C94BD3C9D5 18E0 1309 LICOER  DC    CL20'CARR.LINE CTR.IN ERR'
   18D5 C540C3E3D948C9D5       1309
   18DD 40C5D9D9               1309
```

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   18E1 6060C6D6D9D440D3 18EE 1310         DC    CL14'--FORM LENGTH '
   18E9 C5D5C7E3C840        1310
   18EF 404040              18F1 1311 LNGTH  DC    CL3'   '
   18F2 E3E3E3              18F4 1312 TEES   DC    CL3'TTT'
   18F5 7DC850E37D40D7D9 1904 1313 TITLS    DC    CL16'''H&T'' PRINT TEST'
   18FD C9D5E34CE3C5E2E3    1313
   1905 D7C1D7C5D940E2C5 1917 1314 TITLA    DC    CL19'PAPER SETTLING TEST'
   190E E3E3D3C9D5C740E3    1314
   1915 C5E2E3              1314
   1918 E6D6D9E2C540C3C1 192C 1315 TITLB    DC    CL21'WORSE CASE PRINT TEST'
   1920 E2C540D7D9C9D5E3    1315
   1928 40E3C5E2E3          1315
   192D D9C9D7D7D3C540D7 1938 1316 MSGC     DC    CL12'RIPPLE PRINT'
   1935 D9C9D5E3            1316
   1939 E3C5E2E340C6D6D9 1940 1317         DC    CL8'TEST FOR'
   1941 40E4D5E7D9E3C1C2 194F 1318 UNCSK    DC    CL15' UNPRTABLE CHAR'
   1949 D3C540C3C8C1D9      1318
   1950 40C9D540C4C1E3C1 195D 1319 DEPP     DC    CL14' IN DATA FIELD'
   1958 40C6C9C5D3C4        1319
   195E 40C2C9E340D5D6E3 196A 1320         DC    CL13' BIT NOT SET '
   1966 40E2C5E340          1320
   196B E6C9E3C840E4D5D7 197D 1321 WUDF     DC    CL19'WITH UNPRTABLE DATA'
   1973 D9E3C1C2D3C540C4    1321
   1978 C1E3C1              1321
   197E C5D5E3C5D940D7D9 19AB 1322 INS1     DC    CL46'ENTER PRTR.CMD.CODE OR DELAY TIME IN ADDR.SW''S'
   1986 E3D94BC3D4C44BC3    1322
   198E D6C4C540D6D940C4    1322
   1996 C5D3C1E4E40E3C9D4   1322
   199E C540C9D540C1C4C4    1322
   19A6 D94BE2E67DE2        1322
   19AC D9C5E2C5E340C8C1 19C6 1323         DC    CL27'RESET HALT--REPEAT FOR MORE'
   19B4 D3E3606D9C5D7C5     1323
   19BC C1E340C6D6D940D4    1323
   19C4 D6D9C5              1323
   19C7 6060C5D5E3C5D960 19E5 1324 INS2     DC    CL31'--ENTER-0000-TO BEGIN EXECUTION'
   19CF F0F0F0F060E3D640    1324
   19D7 C2C5C7C9D540C5E7    1324
   19DF C5C3E4E3C9D6D5      1324
   19E6 C9D5E5D3C44BC3D4 19F3 1325 INVC     DC    CL14'INVLD.CMD XXXX'
   19EE C440E7E7E7E7        1325
   19F4 C5D5E3D9C9C5E2   19FA 1326 LIST     DC    CL7'ENTRIES'
   19FB E7E7E7E7            19FE 1327 ELIST  DC    CL4'XXXX'
   19FF D3C1E2E340C3D6D4 1A0C 1328         DC    CL14'LAST COMMAND--'
   1A07 D4C1D5C4E6C6        1328
   1A0D D3C5C6E340          1A11 1329 NACMD  DC    CL5'LEFT '
   1A12 40D5D6E5C5404040 1A23 1330 LACMND DC    CL18' NONE                '
   1A1A 4040404C404C4040    1330
   1A22 4040                1330
   1A24 40404C4C4040        1A29 1331 KNALB  DC    CL6'      '
   1A2A E2E3C1E3E4E240C2 1A3E 1332         DC    CL13'STATUS BYTES '
   1A32 E8E3C5E240          1332
   1A37 40404040            1A3A 1333 YBATS  DC    CL4'    '
   1A3B D7D9C9D6C9C9E3E8 1A4E 1334 PEBI     DC    CL20'PRIORITY ERR BIT IS '
   1A43 40C5D5D940C2C9E3    1334
   1A4B 40C9E24C            1334
   1A4F 4040404040404040 1A5E 1335 IBEP     DC    CL16'                '
   1A57 4C404C4C4040404C    1335
                            1A5F 1336 STATAB EQU   *
   1A5F 008004              1A61 1337         DC    XL3'008004'           CHAIN SYNC CHK.,HALT 04
   1A62 C3C8C1C9D540E2E8 1A71 1338         DC    CL16'CHAIN SYNC CHK. '
   1A6A D5C340C3C8D24B40    1338
   1A72 C04C05              1A74 1339         DC    XL3'004005'           INCR SYNC OR SLIP CHK.,HALT 05
   1A75 C9D5C3D940E2E8D5 1A84 1340         DC    CL16'INCR SYNC/SLIP  '
   1A7D C361E2E3C9D74040    1340
   1A85 100C06              1A87 1341         DC    XL3'100006'           INCR FAILURE CHK.,HALT 06
   1A88 C9D5C3D940C6C1C9 1A97 1342         DC    CL16'INCR FAILURE CHK'
   1A90 D3E4D5C54CC3C8D2    1342
   1A98 C4C009              1A9A 1343         DC    XL3'040009'           HMR ECHO CHK.,HALT 09
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   1A9B C8C1D4D4C5D940C5 1AAA 1344         DC    CL16'HAMMER ECHO CHK.'
   1AA3 C3C8D640C3C8D24B    1344
   1AAB 02000A              1AAD 1345         DC    XL3'02C00A'           ANY HMR ON CHK.,HALT 0A
   1AAE C1D5E840C8C1D4D4 1ABD 1346         DC    CL16'ANY HAMMR ON CHK'
   1AB6 D940D6D540C3C8D2    1346
   1ABE 002007              1AC0 1347         DC    XL3'002007'           HAMMER UNIT THERMAL CHK.,HALT 07
   1AC1 C8D4D94BE3C8C5D9 1AD0 1348         DC    CL16'HMR.THERMAL CHK.'
   1AC9 D4C1D340C3C8D24B    1348
   1AD1 800001              1AD3 1349         DC    XL3'800001'           CARR.SYNC CHK.,HALT 01
   1AD4 C3C1D5D94BE2E8D5 1AE3 1350         DC    CL16'CARR.SYNC CHK.  '
   1ADC C340C3C8D24B4040    1350
   1AE4 400002              1AE6 1351         DC    XL3'400002'           CARR.SPACE CHK.,HALT 02
   1AE7 C3C1D9D94BE2D7C1 1AF6 1352         DC    CL16'CARR.SPACE CHK. '
   1AEF C3C540C3C8D24B40    1352
   1AF7 200003              1AF9 1353         DC    XL3'200003'           FORMS JAM CHK.,HALT 03
   1AFA C6D6D9D4E240D1C1 1B09 1354         DC    CL16'FORMS JAM CHK.  '
   1B02 D440C3C8D24B4040    1354
   1B0A FF                  1B0A 1355         DC    XL1'FF'
   1B0B C8C1D4D4C5D940D5 1B17 1356 HAMNO    DC    CL13'HAMMER NO.   '
   1B13 D64B404040          1356
   1B18 404040              1B1A 1357 HANO    DC    CL3'   '
   1B1B F5F2F0F340D5D6E3 1B28 1358         DC    CL14'5203 NOT BUSY '
   1B23 40C2E4E2E84C        1358
   1B29 C1C6E3C5D940E2C9 1B37 1359 NOBUSY DC    CL15'AFTER SIO ACPTD'
   1B31 D640C1C3D7E3C4      1359
   1B38 F5F2F0F340          1B3C 1360         DC    CL5'5203 '
   1B3D 4040404040404040 1B44 1361 BUNSG  DC    CL8'        '
   1B45 40C2E4E2E840E3D6 1B52 1362 BUTOLO DC    CL14' BUSY TOO LONG'
   1B40 D640D3D6D5C7        1362
   1B53 C3C1D9D9C9C1C7C5 1B5A 1363 CARR   DC    CL8'CARRIAGE'
   1B5B D7D9C9D5E3C5D940 1B62 1364 PRIN   DC    CL8'PRINTER '
   1B63 40C2E4C6C6C5D940 1B6A 1365 BUFF   DC    CL8' BUFFER '
   1B68 D9C9C7C8E3          1B6F 1366 THGIR  DC    CL5'RIGHT'
   1B70 D3C5C6E340          1B74 1367 TFEL   DC    CL5'LEFT '
   1B75 C3D4C44BC4C5C3D6 1B84 1368 REDOP  DC    CL16'CMD.DECODE ERROR'
   1B70 C4C540CC5D9D9D6D9   1368
   1B85 D4C1D2C540F5F2F0 1B91 1369 RORN   DC    CL13'MAKE 5203    '
   1B8D F340404040          1369
   1B92 40D9C5C1C4E8        1B97 1370 MANORE DC    CL6' READY'
   1B98 F5F2F0F340C9E240 1BAD 1371 TON    DC    CL22'5203 IS RDY,SHD.BE NOT'
   1BA0 D9C4E86BE2C8C44B    1371
   1BA8 C2C540D5D6E3        1371
   1BAE 40D9C4E8            1BB1 1372 CORINS DC    CL4' RDY'
   1BB2 F5F2F0F340C2E4E2 1BBB 1373         DC    CL10'5203 BUSY '
   1BBA E840                1373
   1BBC E6C8C5D540D5D6E3 1BC7 1374 BABUSY DC    CL12'WHEN NOT RDY'
   1BC4 40D9C4E8            1374
   1BC8 D7E3D94BC3C8E34B 1BD1 1375 MAP    DC    CL10'PTR.CHT.  '
   1BD0 4040                1375
   1BD2 F1F0                1BD3 1376 CHT10  DC    CL2'10'
   1BD4 F1F1                1BD5 1377 CHT11  DC    CL2'11'
   1BD6 F1F3                1BD7 1378 CHT13  DC    CL2'13'
   1BD8 F1F4                1BD9 1379 CHT14  DC    CL2'14'
   1BDA F1F6                1BDB 1380 CHT16  DC    CL2'16'
   1BDC F1F7                1BDD 1381 CHT17  DC    CL2'17'
   1BDE F1F9                1BDF 1382 CHT19  DC    CL2'19'
   1BE0 F5F2FCF340C9E240 1BEF 1383         DC    CL16'5203 IS NOT RDY.'
   1BE8 D5D6E340D9C4E86B    1383
   1BF0 E2C8C44BC2C540D9 1BF9 1384 SNIROC DC    CL10'SHD.BE RDY'
   1BF8 C4E8                1384
   1BFA F5F2F0F340          1BFE 1385         DC    CL5'5203 '
   1BFF 40404C4040          1C03 1386 RRAC   DC    CL5'     '
   1C04 4040404040404040 1C0C 1387 PBCA   DC    CL9'         '
   1C0C 40                  1387
   1C0D C9E240C2E4E2E86B 1C22 1388 REBUSY DC    CL22'IS BUSY,NO CMD.ISSUED'
   1C15 D5D640C3D4C44BC9    1388
   1C1D E2E2E4C5C440        1388
   1C23 40C4C1E3C1          1C27 1389 ATAD   DC    CL5' DATA'
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ERR LOC  OBJECT CODE        ADDR STMT SOURCE STATEMENT

 1C28 C9D4C1C7C5        1C2C 1390 EGAMI  DC    CL5'IMAGE'
 1C2D 4040404040        1C31 1391 LEBAL  DC    CL5'     '
 1C32 40C1C4C4D548D9C5  1C42 1392 ARWAL  DC    CL17' ADDR.REG.LIC ERR'
 1C3A C748D3C9D640C5D9        1392
 1C42 D5                      1392
 1C43 C9E240            1C45 1393        DC    CL3'IS '
 1C46 4040404C          1C49 1394 DIRIS  DC    CL4'    '
 1C4A 40E2C8C44BC2C540  1C51 1395        DC    CL8' SHD.BE '
 1C52 40404040          1C55 1396 DIRSB  DC    CL4'    '
 1C56 D5D660D6D740D3C1  1C77 1397 NOPLIO DC    CL34'NO-OP LATCH SET WITH NO SIO ISSUED'
 1C5E E3C3C840E2C5E340        1397
 1C66 E6C9E3C640C5D640        1397
 1C6E E2C9D64CC9E2E2E4        1397
 1C76 C5C4                    1397
 1C78 C3C8C1C9D540C3C8  1C9C 1398 CHACHE DC    CL37'CHAIN CHK.,IMAGE & CHAIN DO NOT AGREE'
 1C80 D24B6BC9D4C1C7C5        1398
 1C88 405040C3C8C1C9D5        1398
 1C90 40C4D640D5D6E340        1398
 1C98 C1C7D9C5C5              1398
                              1399
                              1400 ********************
                              1401 * RESERVED STORAGE **********************************************************
                              1402 ********************
 1F60                         1403        CRG   X'1F60'
                        1F6C  1404 ETABLE EQU   *
 1F60 00000000000000000 1F89  1405        DC    XL42'0'
 1F68 00C0C0C0C0C00000        1405
 1F70 0000000000C00000        1405
 1F78 0000000000000000        1405
 1F8C CCC0C0C000C00000        1405
 1F88 0000                    1405
 1F8A FF                1F8A  1406        DC    XL1'FF'
 1F8B 00                1F8B  1407 TAGS   DC    XL1'0'          PROGRAM FLAGS
 1F8C                   1F8D  1408 STAT0  DS    CL2
 1F8E                   1F8F  1409 STAT2  DS    CL2
 1F90                   1F91  1410 ERT1   DS    CL2
 1F92                   1F93  1411 STAT6  DS    CL2
 1F94                   1F95  1412 STAIX  DS    CL2
 1F96                   1F97  1413 CMDSAV DS    CL2
 1F98                   1F99  1414 FINDEX DS    CL2
 1F9A                   1F9B  1415 SINDEX DS    CL2
 1F9C                   1F9D  1416 MSECS  DS    CL2             DELAY TIME AREA
 1F9E                   1F9F  1417 WORK   DS    CL2
 1FA0 00                1FA0  1418 LINOSA DC    XL1'0'          LINE NO. PRINTED SAVE AREA
 1FA1 00                1FA1  1419 LICTR  DC    XL1'0'          LINE NO. COUNTER
 1FA2 CC                1FA2  1420 RICTR  DC    XL1'0'          RIGTT LINE NO. COUNTER
 1FA3 000000            1FA5  1421 BUSUB  DC    XL3'0'
                              1422 *
                              1423 **  TABLE OF PRINTER COMMANDS
                              1424 *
                        1FA6  1425 CMDTAB EQU   *
 1FA6 E4C1              1FA7  1426        DC    X'2'E401'       SKIP TO LINE 1
 1FA8 E200              1FA9  1427        DC    XL2'E200'       PRINT
 1FAA E00C              1FAB  1428 SPACE0 DC    XL2'E000'       SPACE 0
 1FAC E200              1FAD  1429        DC    XL2'E20C'       PRINT
 1FAE E001              1FAF  1430        DC    XL2'E001'       SPACE 1
 1FB0 E2C0              1FB1  1431        DC    XL2'E200'       PRINT
 1FB2 E002              1FB3  1432        DC    XL2'E002'       SPACE 2
 1FB4 E2CC              1FB5  1433        DC    XL2'E200'       PRINT
 1FB6 E003              1FB7  1434        DC    XL2'E003'       SPACE 3
 1FB8 E201              1FB9  1435        DC    XL2'E201'       P/SPACE 1
 1FBA E2C2              1FBB  1436        DC    XL2'E202'       P/SPACE 2
 1FBC E203              1FBD  1437        DC    XL2'E203'       PRINT & SPACE 3
 1FBE E200              1FBF  1438        DC    XL2'E200'       PRINT/NO SPACE
 1FC0 E411              1FC1  1439        DC    XL2'E411'       SKIP TO LINE 17
 1FC2 E616              1FC3  1440        DC    XL2'E616'       PRINT & SKIP TO LINE 22
 1FC4 E601              1FC5  1441        DC    XL2'E601'       PRINT & SKIP TO 001
 1FC6 0000              1FC7  1442        DC    XL2'0'          DONE
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ERR LOC  OBJECT CODE        ADDR STMT SOURCE STATEMENT

                              1443
                        1FC8  1444 SPSK   EQU   *
 1FC8 E42A              1FC9  1445        DC    XL2'E42A'       SKIP TO LINE 42
 1FCA E001              1FCB  1446        DC    XL2'E001'       SPACE 1
 1FCC E455              1FCD  1447        DC    XL2'E455'       SKIP TO LINE 85
 1FCE E001              1FCF  1448        DC    XL2'E001'       SPACE 1
 1FD0 E470              1FD1  1449        DC    XL2'E470'       SKIP TO LINE 112
 1FD2 E001              1FD3  1450        DC    XL2'E001'       SPACE 1
 1FD4 E002              1FD5  1451        DC    XL2'E002'       SPACE 2
 1FD6 E003              1FD7  1452        DC    XL2'E003'       SPACE 3
 1FD8 E000              1FD9  1453        DC    XL2'E000'       SPACE 0
                              1454
                              1455 ***********
                              1456 * EQUATES ***************************************************************************
                              1457 ***********
                        0008  1458 ARR    EQU   X'8'            ADDRESS RECALL REGISTER
                        0001  1459 XR1    EQU   X'1'            INDEX REGISTER 1
                        0002  1460 XR2    EQU   X'2'            INDEX REGISTER 2
                        080C  1461 LPI    EQU   X'800'          LINE PRINTER IMAGE AREA
                        082F  1462 ATETUF EQU   X'82F'          END OF  48 CHAR. IMAGE
                        087C  1463 LPD    EQU   X'87C'          LINE PRINTER DATA AREA
                        0877  1464 ATSVNS EQU   X'877'          END OF 120 CHAR. IMAGE
                        0878  1465 UCSFLG EQU   X'878'
                        08C3  1466 DASTU  EQU   X'8C3'
                        08D8  1467 ATEFIV EQU   X'8D8'
                        08DB  1468 ATEATE EQU   X'8DB'          96TH POSITION
                        08FF  1469 PRDAT  EQU   X'8FF'
                        1F77  1470 EDIMAG EQU   X'1F77'
                        1F84  1471 PFIELD EQU   X'1F84'
                        00E0  1472 LOFDLG EQU   X'E0'
                        00E4  1473 LPIAR  EQU   X'E4'
                        00E6  1474 LPDAR  EQU   X'E6'
                        0212  1475 TEST   EQU   X'212'          ENTRY TO DCP READ DATA SW'S ROUT.
                        0216  1476 LINK   EQU   X'216'          ENTRY TO DCP CHAIN ROUTINE
                        021A  1477 PRINT  EQU   X'21A'          ENTRY TO DCP PRINT ROUTINE
                        021E  1478 UNPACK EQU   X'21E'          ENTRY TO DCP UNPACK TO EBCDIC RTN
                        0222  1479 HALT   EQU   X'222'          ENTRY TO DCP ERROR HALT ROUTINE
                        022A  1480 LOAD   EQU   X'22A'          ENTRY TO DCP TERMINATE SECTION
                        00E0  1481 NRDY   EQU   X'E0'
                        00E6  1482 BUSY   EQU   X'E6'           PRINTER BUSY
                        00E4  1483 CABUSY EQU   X'E4'           LEFT CARR.BUSY
                        00EC  1484 RICABY EQU   X'EC'           RIGHT CARR. BUSY
                        00E2  1485 PBBUSY EQU   X'E2'           BUFFER BUSY
                              1486 *   INDICATOR FLAGS.
                        0002  1487 TAG6   EQU   X'2'            STATUS ERR INDICATOR
                        0001  1488 TAG7   EQU   X'1'            PRINT 1ST LINES ONLY FLAG
                              1489 *   SENSE SWITCH EQUATES.
                        0208  1490 SBYTE0 EQU   X'208'          DCP SENSE SWITCH AREA
                        0209  1491 SBYTE1 EQU   X'209'          DCP SENSE SWITCH AREA
                        020A  1492 SBYTE2 EQU   X'20A'          SECTION SENSE SWITCH AREA
                              1493 *  CONTROL PGM SENSE SWITCHES
                        0004  1494 SSW05  EQU   X'4'            PRINT MESSAGES ON ALT.PRTR.
                        0080  1495 SSW08  EQU   X'80'           USE 5203 RIGHT CARR.
                              1496 *  SECTION SENSE SWITCHES.
                        0040  1497 SSW11  EQU   X'40'           HALT BETWEEN COMMANDS
                        0020  1498 SSW12  EQU   X'20'           DELAY BETWEEN CMDS.
                        0010  1499 SSW13  EQU   X'10'           SECONDARY HALT OPTION
```

E013 5203 LINE PRINTER FUNCTION TESTS

```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

                        1501
                        1502
                        1503 *                    COMMENT CARDS
                        1504
                        1505 ********** SECTION E01 ROUTINES **************************************
                        1506 * ROUT.01 - SENSE CMD TEST
                        1507 * ROUT.02 - TIO NOT RDY TO NOT RDY PRTR.
                        1508 * ROUT.03 - TIO BUSY TO NOT RDY PRTR.
                        1509 * ROUT.04 - TIO NOT RDY TO RDY PRTR.
                        1510 * ROUT.05 - TIO BUSY TO RDY PRTR.
                        1511 * ROUT.06 - LIO'S TO RDY PRTR.
                        1512 * ROUT.07 - CMDS TEST.
                        1513 * ROUT.08 - CARRIAGE SPACE/SKIP TEST.
                        1514 * ROUT.09 - 'H & T'PRINT TEST.
                        1515 * ROUT.0A - PAPER SETTLING TEST.
                        1516 * ROUT.0B - WORSE CASE PRINT TEST.
                        1517 * ROUT.0C - RIPPLE PRINT TEST.
                        1518 * ROUT.0D - UNPRINTABLE CHAR TEST.
                        1519 * ROUT.0E - ENTER YOUR OWN CMDS TEST.(MUST BE REQUESTED BY OPERATOR)
                        1520 ********************************************************************************
                        1521 *     SSW OPTIONS
                        1522 ********************************************************************************
                        1523 * SSW-11 - HALT BETWEEN CMDS  (VALID IN ROUTINES 7,8,9,0B,0C & 0E)
                        1524 * SSW-12 - DELAY BETWEEN CMDS (VALID IN ROUTINES 7,8,9,0B,0C & 0E)
                        1525 * SSW-13 - SECONDARY HALT OPTION (DIAGNOSIS OF ONLINE ERROR DATA )
                        1526 ********************************************************************************
                        1527 * NOTES -
                        1528 *  1.RESTORE CARRIAGE(S) BEFORE STARTING THIS SECTION.
                        1529 *  2.CARRIAGE FORMS MUST BE LEFT ALIGNED IN PRINT POSITION 1,EVEN IF
                        1530 *    THE RIGHT CARRIAGE IS BEING TESTED.
                        1531 *  3.SET C.E.SWITCH TO OVERRIDE IDLE CONTROL BEFORE RUNNING THIS TEST.
                        1532 ********************************************************************************
                        1533
                    FFFF 1534          END
```


E013 5203 LINE PRINTER FUNCTION TESTS

CROSS-REFERENCE

```
SYMBOL  T LEN VALUE  DEFN   REFERENCES
ADBUBY  A 002 185A   1283   1047
ADCABY  A 002 185C   1284   1056
ADDATE  A 001 1CF4   0661   0684* 0697  0699*
ADFL42  A 002 1854   1280   0384  0385  0386
ADFL85  A 002 1856   1281   0390  0391  0392
ADFOLG  A 002 1858   1282   0394  0395  0396  0964
ADPIBY  A 002 185E   1285   1060
ADTUSX  A 004 112C   0683   0672  0698
AD107   A 006 16EF   1157   1150  1154
AD119   A 006 16E6   1155   1152
ARR     C 001 0008   1458   0825  0846  0921* 0922  0923* 0924  0925  0926* 0927  0942  0965* 0966
                            0967* 0968  1119  1177
ARWAL   A 017 1C42   1392   0256  0286
ASTERR  A 004 172E   1176   1027
ATAD    A 005 1C27   1389   0282
ATEATE  C 001 08DB   1468   0532* 0533  0548* 0549
ATEFIV  C 001 08D8   1467   0533* 0549*
ATETUF  C 001 082F   1462   0631
ATSVNS  C 0C1 0877   1464   0635
AWDUN   A 004 1715   1165   1162
BABUSY  A 012 1BC7   1374   0129
BACGO   A 004 0D1C   0353   0419
BADCMD  A 005 11F5   0777   0770  0772  0790  0792
BERALT  A C02 0BFB   0224   0203* 0209* 0213* 0217* 0230
BROUT   A 004 140A   0942   0244  0531  0995
BSEXIT  A 004 142E   0951   0942* 0947
BSYLP   A 006 15C8   1065   105C  1059  1063
BUALT   A 002 1600   1081   1048* 1C57* 1C61* 1070
BUBY    A C04 1589   1050   1283
BUFF    A 008 186A   1365   0208  1049
BUMSG   A 008 1B44   1361   1049* 1058* 1062*
BUSCT   A 003 1838   1264   1046
BUSCTI  A 003 183B   1265   0943
BUSLE   A 006 08C8   0211   0205
BUSRI   A C06 08DB   0215   0206
BUSUB   A 003 1FA5   1421   0943* 0944* 1046* 1065*
BUSY    C 001 00E6   1482   0122  0191  0199  0542  0946  1024  1063
BUTIN   A 004 17F5   1238   1237* 1241* 1242
BUTOLD  A 014 1B52   1362   1075
BWHER   A 004 114F   0693   C680*
BZOOP   A 004 0FAA   0544   0542
CABUSY  C 001 00E4   1483   0205  0537  1009
CABY    A 004 15BC   1059   1005* 1009* 1284
CARR    A 008 1B5A   1363   0211  0215  1058
CCGO    A 004 128C   0849   0846*
CHACHE  A 037 1C9C   1398   0065
CHRDY   A 004 1601   1082   1064
CHT10   A 002 1BD3   1376   0104  0171
CHT11   A 002 1BD5   1377   1223
CHT13   A C02 1BD7   1378   0046  0246
CHT14   A 002 1BD9   1379   0433
CHT16   A 002 1BDB   1380   0708  1094
CHT17   A 002 1BDD   1381   0131  0225  1018
CHT19   A 002 1BDF   1382   0067
CKCMD   A 004 12A3   0846   0337  0819
CKDONE  A C05 12AB   0848   0915
CKOUNT  A 006 0D69   0374   0376  0386* 0392* 0396*
CKSKIP  A 003 1213   0789   0774
CLINK   A 004 0E76   0441   C418
CMDSAV  A 002 1F97   1413   0354* 0368  0373  0381  0777* 0780  0803* 0807  0856* 0880  0883  0885
                            0891  C898  0900* 0902  0904  0906
CMDTAB  A 001 1FA6   1425   0336
CMND    A 003 150D   1017   0971* 0972  0973  0986  1001* 1002  1003  1008  1013  1019  1022
CMODE   A 002 1566   1042   1040*
CNCO    A 002 1572   1045   1043*
COCOCO  A 004 1317   0877   0874
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
COLLIC	A	004	12E4	0864	0859
CORINS	A	004	1BB1	1372	0102
CSSWOA	A	004	146D	0978	0976
CVD	A	004	13B9	0921	0359 0363 0367 0397 0860 0864 0879 1165 1182
DABOT	A	006	16BB	1144	1141
DADEND	A	002	164C	1275	1142
DASH	A	001	186A	1294	0361 0365 0366 0862 0866
DASTU	C	001	08C3	1466	0575* C576 C576*
DECGAN	A	006	13F3	0933	0936
DECONE	A	001	1852	1279	0483 0935
DECZRO	A	001	1851	1278	0481 0932
DELAY	A	C04	15D1	1066	1047* 1056* 1060*
DEPP	A	014	195D	1319	1092
DIRIS	A	004	1C49	1394	0261 0291
DIRSB	A	004	1C55	1396	0265 0269 0295 0299
DIVID	A	004	16FE	1160	1156 1158
DNTRES	A	004	13CE	0875	0870
DOCMD	A	004	13AA	0912	C852 0854 0903 C907
DOCMDS	A	004	122F	0797	0766 0795
DOHALT	A	C06	17C4	1223	1213 1215 1217
DORIPL	A	004	10A7	0637	0634
DOUT	A	004	1192	0715	0679 0695
DOXIO	A	CC2	13AF	0913	0850*
DQ112	A	006	0DC5	0394	0389
DSKPOP	A	004	16B3	1306	1184 1185 1192
DUSPOP	A	003	18A8	1304	1186
EDIMAG	C	001	1F77	1470	0534* 0535 C535*
EGAMI	A	C05	1C2C	1390	0252
EIGHT	A	002	182C	1258	0696
ELIST	A	004	19FE	1327	0808 0812
ENTERC	A	004	11B7	0758	0796
ENTER1	A	003	11C9	0763	C758 C760* C761 0762*
ERNRDY	A	C04	14A1	0990	0988
ERR41	A	CC4	CBE1	0176	C165
ERR51	A	006	0B76	0193	0191
ERT1	A	002	1F91	1410	0019 1002* 1040 1043 1179 1183 1187 1190
ETABLE	A	001	1F60	1404	C757 C8C2 C817
EXIT	A	004	164C	1106	0968*
EXP12	A	CC2	CACE	0C27	0035* 0037
F013	A	001	0A00	0003	
FINDFX	A	002	1F99	1414	0460* 0471* 0474 0517* 0552 0554* 0574* C590 0592* 0691* 0692 0694 C869 0901* 0910
FINFF	A	004	0E92	0460	0489
FLOOP	A	0C6	1414	0944	0946
FL42	A	002	183D	1266	1280
FL85	A	002	183F	1267	1281
FOADD	A	0C6	172C	1169	1125 1130
FOLG	A	002	1841	1268	C374 C852 0894 1282
FOLIC	A	004	CCC8	0306	0279
FOUR	A	002	1829	1256	0482 1161 1169
FRADD	A	002	0DDC	0398	0385* 0391* 0395*
FRANG	A	004	CD3F	0363	0358
FRMLE	A	004	14BF	0998	0384* C390* C394* 0564*
FROBYT	A	006	13E7	0931	0928*
FROM	A	006	13D5	0928	C922*
FRSMV	A	004	1594	1053	C623* 0629* C640* 0641* 0646* C647* 0650
GETAH	A	0C4	0FF6	0575	0593
GETIM	A	004	1279	0826	0828
GETNXT	A	005	123D	0803	0814
GETOUT	A	CC4	0F0B	0490	0477
GIDDAP	A	004	0C22	0245	
GODEC	A	006	16F8	1159	1148
GOLIO	A	004	CC78	0276	0249
GOMUST	A	004	1777	1193	1191
GOM4	A	004	0F6D	0529	0519
GOTHRU	A	004	1265	0817	C820

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
GRALT	A	0C4	0A4A	0051	0040
GRED	A	004	1121	0680	0675 0678
HALIT	A	004	0A89	0072	0061
HALT	C	001	0222	1479	C051 0072 0109 0136 0176 0231 0274 0304 0320 0438 0526 0546 0713 0948 0992 1036 1041 1044 1080 1099 1231 1244
HAMNO	A	013	1B17	1356	1222*
HANG	A	004	CF71	0530	0522 0528
HANO	A	003	1B1A	1357	0481* 0483* 0484 1144* 1167 1221
HLTID	A	002	1780	1157	0421* 1026* 1070* 1136* 1230
HOMANY	A	004	1153	0694	0673* 0676*
HXBYT	A	001	13B8	0920	0931* 0933*
IBEP	A	016	1A5E	1335	1137* 1211
IMALT	A	004	0C72	0274	0251
INCCMD	A	006	1373	0899	0888 0893 0895 0905
INS1	A	046	19AB	1322	0751
INS2	A	031	19E5	1324	0756
INVC	A	014	19F3	1325	0781 0785 1144
ISBUSY	A	006	1573	1046	1020 1023 1024 1039
ISLAS	A	003	0E25	0417	0413 0440
ISSKIP	A	004	1364	0896	C884
ITSASP	A	004	0DD7	0397	0379 0387 0393
ITSLEF	A	004	0F38	0514	0509
JEXT	A	0C4	0A54	0C54	0053
JIVE	A	004	0B42	0164	0162
JUMRES	A	003	0D7E	0378	0375
JUSALT	A	006	0C0A	0230	C219
KNALB	A	006	1A29	1331	0155 0202 0426 1189 1222
LACMND	A	018	1A23	1330	1186* 1189* 1192* 1196
LALPD	A	004	12FC	0871	C868
LALT	A	004	0CEC	0320	0310
LCML	A	001	0E5B	0431	0425* 0428*
LDCMD	A	006	1450	0971	0966*
LEBAL	A	005	1C31	1391	0252* 0282*
LEFLIC	A	006	0E16	0414	0409
LICDSA	A	006	1523	1022	1007* 1011*
LICOER	A	020	18E0	1309	0432
LICTR	A	001	1FA1	1419	0335* 0351* C373* 0374 0377* 0381* 0411 0415 0867 0873 0891* 0892 0894* 0898*
LINK	C	001	0216	1476	0074 C111 0138 0178 0233 0322 0338 0443 0492 0558 0596 0654
LINOSA	A	001	1FA0	1418	0847* 0867 0873*
LIST	A	007	19FA	1326	0800
LNGTH	A	003	18F1	1311	0399 C401
LOAD	C	001	022A	1480	0717
LOARR	A	003	0AB2	0095	0088
LOFOLG	C	001	00E0	1472	C998*
LPD	C	001	087C	1463	0355 0479 0580 0587* 0637 C639* 0681 0871
LPDADR	A	002	184A	1274	0276 0278 0294 0997 1140
LPDAR	C	001	00E6	1474	0276* 0997*
LPI	C	001	0800	1461	0194 0194 0195 0195 0579 0830 0830 0831 0831 0982 0982 0983 C983
LPIADR	A	002	1846	1272	0245 0248 0264 0996
LPIAR	C	001	00E4	1473	0245* C539* 0996*
LSMFT	A	004	0CC2	0304	C281
LUKE	A	002	0E71	0439	0421
MANORE	A	006	1B97	1370	C093 0159
MAP	A	010	1BD1	1375	0046* 0050 0067* 0071 C164* 0108 0131* 0135 0171* 0175 0225* 0229 0246* 0273 0303 0319 0433* 0437 0708* 0712 1018* 1035 1079 1094* 1098 1223* 1227
MEXIT	A	004	129F	0834	0825*
MLESID	A	002	1817	1245	1243*
MODASH	A	0C5	0D47	0366	0362
MOOM	A	004	CFC1	0487	0465
MOWIT	A	006	180C	1243	1239
MSECS	A	002	1F9D	1416	0193* 0196* 0829* 0832* 0972* 0980* 0981* 0984*
MSGC	A	012	1938	1316	0617
MUSTU	A	004	0E30	0420	0412 0416

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
M4DEL	A	004	1275	0825	0468 C525
NACML	A	005	1A11	1329	1178* 1181*
NADUN	A	004	100E	0581	C586
NEAKR	A	004	0EEA	0482	0486
NEXCAR	A	0C3	1134	C685	0700
NEXLEN	A	003	0DAA	0388	0383
NEXT	A	004	1221	0793	0768 0776
NIGEB	A	004	0A1E	0036	0034
NOBALT	A	002	1553	1037	1026
NOBUSY	A	015	1837	1359	1031
NOCOR	A	004	0EA8	0466	0475
NOERR	A	003	1678	1128	1135
NOPLIC	A	034	1C77	1397	0314
NOTRIT	A	006	14CE	1002	1000
NOZO	A	004	1343	0889	0886
NRDY	C	C01	CCE0	1481	0086 0096 0151 0162 0530 0538 0988 1082
NRDYER	A	0C4	163C	1102	1082
OCOCC	A	004	131F	0879	0911
OGOG	A	004	0F44	0517	0513
OKYDOK	A	004	0A8F	0074	0059
ONE	A	002	1623	1253	0196 0471 0544 0554 0592 0646 0647 0648 0649 0832 0921 0926 C933 C944 0965 0967 0984 1065 1163
ONTUTR	A	001	1844	1271	1146
OTORZ	A	006	13E1	0930	0925*
PBBUSY	C	001	00E2	1485	0053 C204 1C50
PBCA	A	009	1C0C	1387	0201* 0208* C211* 0215*
PEBI	A	C20	1A4E	1334	
PFIELD	C	001	1F84	1471	0631* C632 0632* 0635* 0636 0636* 0638 0639
PIBY	A	004	15C4	1063	1285
POPSUB	A	002	18A5	1303	1185*
PRDAT	C	001	08FF	1469	0469* 0470 0470* 048C* 0485
PREXIT	A	C04	181C	1247	1177*
PRFCU	A	004	0AED	0124	C122
PRIN	A	008	1B62	1364	0201 1062
PRINT	C	001	021A	1477	0041 0C47 0062 0068 0090 0099 0105 0126 0132 0156 0166 0172 C220 0226 0253 0266 0270 0283 0296 0300 0311 0316 0429 0434 0454 0490 0503 0556 0569 0594 0614 0652 0667 0703 0709 0748 0753 C782 0797 0809 0815 1028 1032 1072 1076 1089 1095 1193 1202 1208 1218 1224 1228
PRNRDY	A	004	0F64	0526	0530 0538
PRTGP	A	012	1876	1295	C872 0876
PSSIO1	A	003	0F8D	0536	0510* 0514*
PSSIO2	A	0C3	0F9C	0540	0512* 0516*
PSTERR	A	004	1732	1177	0422 C991 1071 1C84 1103
PUIDIA	A	002	17E2	1232	1230*
PUTSUM	A	0C2	0DF8	0406	0404*
RAELC	A	004	0B95	0199	0198
REBUSY	A	022	1C22	1388	0223
RECAS	A	0C4	11C5	C762	C759
REDOP	A	016	1884	1368	0044
RESET1	A	004	1C85	0640	0621* 0627*
RESET2	A	004	10B9	0641	C622* C628*
RESTO	A	004	1726	1170	1145 1168
RICABY	C	0C1	0CEC	1484	C206 1C05
RICTR	A	001	1FA2	1420	C818*
RNUM	A	001	0AC3	0016	1012 1051 1085
ROCON	A	004	0EB3	C469	0459* 0467 0476 C478*
RERN	A	013	1B91	1369	0089* 0155*
RPLOOP	A	004	10C5	0644	0651
RRAC	A	005	1C03	1386	0202* 0212* 0216*
RSOUNT	A	006	0D78	0377	0376*
RTNOA	A	001	0F14	0499	0452
RTNOB	A	001	0FE4	0565	C501
RTNOC	A	001	104C	0610	0567
RTNOD	A	0C1	1CF5	0663	C612
RTNOE	A	001	119D	0744	0665

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RTN1	A	001	0A0F	0029	C018
RTN2	A	001	0A93	0082	0031
RTN3	A	C01	0AE2	0118	0084
RTN4	A	001	0B16	0147	C120
RTN5	A	001	0B6B	0187	0149
RTN6	A	001	0C1A	0240	0189
RTN7	A	001	0CF6	0331	0242
RTN8	A	001	0DCA	0345	0333
RTN9	A	001	0E80	0450	0347
R1NRDY	A	004	0ADE	0111	0086 0096
R2BUSY	A	004	0BCC	0136	C125
R2EXIT	A	004	0B12	0138	0123
R4CHK	A	004	0B3B	0162	0152
R4EXIT	A	004	0B67	0178	0163
R4NRDY	A	003	0B38	0161	0154
R5EXIT	A	004	0C16	0233	0192 0200
R6EXIT	A	004	0CF2	0322	0308
SABTR	A	006	16C4	1146	1143
SAMASH	A	006	12EC	0867	0863
SATCH	A	006	0FB8	0548	0543
SAVCMD	A	005	1379	0900	0855* 0899*
SAVTUU	A	002	1653	11C8	C970* 1105
SAVWUN	A	002	1651	1107	0969* 1104
SBUSY	A	004	CF9C	0537	C511* 0515* 0537
SBYTE0	C	001	0208	1490	0039 0C60 0C87 0097 0124 0153 0164 0218 0250 0280 0309
SBYTE1	C	001	0209	1491	0357 0408 0508 0858 0999
SBYTE2	C	001	020A	1492	0975 C978 1038 1233
SDC	A	006	140E	0943	C950
SDEHF	A	004	1609	1084	1068
SEFILD	A	006	1088	0631	0620 0626
SEIFSK	A	004	176A	1190	1188
SESTAT	A	004	0A5F	0057	0055
SFHU	A	002	1850	1277	C193
SIADD	A	002	184E	1276	0539
SINDEX	A	002	1F9B	1415	C584* 0585
SIOOK	A	004	14B3	0995	C989
SIOST	A	004	0F48	0518	0525 0555
SIX	A	001	182A	1257	1240
SKIDO	A	004	159C	1055	1052
SKIXIO	A	004	1438	0965	0402 0405
SKLINO	A	002	188E	1298	0369 C370 038C C881 0882 0897
SKMOVE	A	005	1368	0897	0878* 0909*
SKRICA	A	004	14EC	1009	1004
SKRIG	A	004	1749	1182	1180
SNDMV	A	004	1598	1054	0624* 0630* 0642* 0643* 0648* 0645*
SNIROC	A	010	1BF5	1384	0169
SPACEO	A	002	1FAB	1428	0885 1006* 101C* 1C19
SPALT	A	004	0A50	0053	C038
SPMOVE	A	005	1347	0890	0877* C908*
SPOP	A	012	1882	1296	0370* 0372 0882* 0890
SPSK	A	001	1FC8	1444	0352
SPUDT	A	003	0A0C	0020	0033 C461 0466 0518 0619 G625 0674 0677
SSWO5	C	001	0004	1494	0039 0060 0087 0097 0124 0153 0164 0218 0250 0280 0309
SSWO8	C	001	0C80	1495	0357 0408 0508 0858 0999
SSW11	C	001	0040	1497	0975
SSW12	C	001	0C20	1498	0978
SSW13	C	001	0010	1499	1038 1233
STAIX	A	002	1F95	1412	0036* 0037 0247* 0248 0260 0277* 0278 0290 1139* 1140 1142 1146* 1147 1149 1151 1153 1155* 1157* 1159* 1160* 1161* 1163* 1166 1238 1240* 1243
STATAB	A	001	1A5F	1336	1127
STATO	A	002	1F8D	1408	0356* 0360 0364 0407* 0411 0415 0857* 0861 0865 1021* 1286 1287
STAT2	A	002	1F8F	1409	0463* 0464 0826* 0827 1C14* 1015
STAT6	A	002	1F93	1411	0057* 0058 0306* 0307 0520* 0521 0689 1087 1121* 1122 1124 1133 1134 1176* 1200 1212 1214 1216 1235
STBEP	A	004	0E52	0428	0424

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
STECK1	A	004	168B	1133	1131*
STECK2	A	004	168F	1134	1132*
STERR	A	004	1656	1119	0990 1067 1083 1102
STEXIT	A	004	172A	1171	1119* 1169*
STILL	A	0C6	CB9C	0201	C199
STSAI	A	002	1655	1117	1120* 1170
STOAD	A	002	186C	1286	1007
STOM1	A	002	1862	1287	1011
SUBGAN	A	006	1702	1161	1164
SUNERD	A	004	CEAF	0468	0462
SVNTEN	A	002	1831	1261	0400
TAGS	A	G01	1F8B	1407	0420* 0423 1025* 1069* 1126* 1138* 1206 1246*
TAG6	C	001	0002	1487	C423 1126 1138
TAG7	C	001	0001	1488	0420 1025 1069 1206 1246
TALT	A	004	0AD8	G109	C098
TECHBI	A	004	0A63	0058	C056*
TEES	A	G03	18F4	1312	0548
TEGAN	A	004	0FA3	0542	0545
TEPCU	A	004	0BEB	0218	0207 0210 0214
TESER	A	004	1818	1246	1207 1234 1236
TEST	C	001	0212	1475	1055
TFEL	A	005	1B74	1367	0212 0414 1178
THGIR	A	005	1B6F	1366	C216 041C 1181
THROUT	A	004	0FDB	0556	0553
TIOCHK	A	004	149A	0988	0979 C994
TITLA	A	039	1917	1314	C506
TITLB	A	021	192C	1315	0572
TITL9	A	016	1904	1313	0457
TIXE	A	004	1406	0937	0927* 0934
TNIRP	A	004	0E56	0429	0427
TOBYT	A	006	13FC	0935	C929*
TOLONG	A	004	1424	0948	0945
TON	A	022	1BAD	1371	0089
TREE	A	G02	1827	1255	0582
TUFORF	A	002	1848	1273	0585
TW	A	006	0B7C	0194	C197
TWLVE	A	002	182F	1260	0371 0875 0889 C896
TWO	A	002	1825	1254	0353 0581 0793 0804 0899 0914 0923
TWYSIX	A	002	1835	1263	C683
TWYWUN	A	002	1833	1262	1159
TYBOT	A	006	13D8	0929	C924*
TYBS	A	004	0821	0153	0151
UCSFLG	C	001	0878	1465	0054 0633
UFERR	A	006	0B8B	0208	0204
UNCSK	A	015	194F	1318	0670
UNITIN	A	001	1843	1270	1155
UNOSVN	A	001	1842	1269	1157
UNPACK	C	001	021E	1478	0258 0262 0288 0292 0778 0805 1198
UPCER	A	004	116E	0701	0690
WAHOL	A	004	1501	1014	1016
WAT	A	006	1289	0830	0833
WHIHLT	A	004	122B	0796	0788
WICH	A	006	18CC	1308	0410* 0414* 0426*
WORK	A	002	1F9F	1417	
WT	A	006	147C	0982	C974 C985
WUDF	A	019	197D	1321	0706
WUNTH	A	004	113C	0684	C682
XIO	A	006	1432	0964	0349 C441 0472 0487 0523 0550 0577 0588 0644 0686 0701 0715 0912
XIOEXT	A	004	1644	1104	0987 1086 1088 1101
XR1	C	001	0001	1459	C336* C352* 0353* C354 C378 C382 0388 0404 0417 0541* 0544* 0580* 0582* 0583 0637* 0681* 0683* 0685 0688 0691 0696* 0757* 0764 0765 C767 0769 0771 C773 0775 0777 0789 0791 0793* 0794 0802* 0803 0804* 0813 0817* 0848 085C C851 0853 0856 C900 0914* 0969 1053 1054 1104* 1120 1127* 1128 1128* 1129 1131 1132 1136 1137 1170*
XR2	C	001	0002	1460	0355* C366 0371* 0372 0380 0400* 0401 0479* 0482* 0484 0579* 0581*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
					0583 0584 0638* 0672* 0679* 0680 0871* 0872 0875* 0876 0887 0889* 0890 0896* 0897 0901 0970 1053 1054 1105*
XTEN	A	001	182D	1259	1241
YBATS	A	004	1A3A	1333	1201 1205
YEOW	A	002	0C15	0232	0230*
YESER	A	004	1670	1126	1123
ZERO	A	002	1821	1252	0541 C765 0813 0848 0902
ZIGOUT	A	004	1043	0594	0591
ZROTO	A	006	13ED	0932	0930*

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

THE CHARACTER ° INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-Y:8A<°°ē°B-a	¬U;A&°DA°&°HU3-	AB-32D°&@°°Y+<+°	¬V&4AG9MHC?HAIL-	D°-T2UAT°/OHĒOJ°	$/+°°43&E0130001
T+-Z5<°OAF°D$5@B	G°/DAB/?JOH*BH>°	OO;HNC7"BGT2°&&	@+&ZT<+<-U3-DG9|	2DBM8A°HH@Z°QOH*	BF%D°MC4E0130002
T+-D̄OIJ2*8°8<°J?	JF°"°/OHĒ-&Y$4*B	G°S.-C%BG°/QB-°,	SO;°H7T-D°-T2UA°	<°/>JF:7°/OHĒ&J<	$V=°°MRHE0130003
T+-,,8|A@$@G-B_8	8A°HH@Z°QOH*BF%D	ĒF#G-<&CAF°D$4@B	G°/DAB/?JOH*BH>°	1OH*BE-< B1$A9-,	_@Y*°3,-E0130004
T+-%WIL-D°-T2UAT	°/OHĒOJQ$1=°2C°D	$4J?|OH*BFYDHF°G	°/OHS8C.°/OHOAH°	.Ē@G-B2G2/1Y8A°H	H@Z°°=30E0130005
T+-_/D°OBF9DĒH*B	G°/ZAD1>P8+GO¬°|	A8°_B@Y*V+°&BB|H	&F<BG°/,AF/?98A°	<°J?JF°|°/OHĒ-&Y	$4°°;RYE0130006
T+->*/OHS8AC°/OH	OA&°<F%GWB7$2/:°	<°J=)FE°("O-°B°°	(+O-°B°°|°J=)FB|	°/°_@@Y*°O;Q.X|H	G;-O°6/8E0130007
T+-?PA1O<F6H<AAO	CFSU@D&?#O;H.>@G	UB@TA#°?$@Y*OC°*	*CA_D|C*.="HGHOO	GG°O$O-ODG°<$)CO	8B"%°KR8E0130008
T+-OK@Y*&C°**CA_	ĒC°&°1_?|CU.=3-	D°-T2UAT°/OHĒOKU	*H>°°C°D$4J?)OH*	BFYDHF°D<°°ONB"?	°/OH°Ē,%E0130009
T+-1(H>°°OH*BE-Q	°C|$°/1&H<;&QJ-O	AF°D$53CUG9M(°J=	NFD$2-L@8A°HH@Z°	2C°&*<JO%OH*BF%D	OGDH°°THE0130010
T+-2H8C,°/O(;°/=	NGDX°/OH;°//FGEP°	°/OHĒ-J<*N*BG°/D	AB/?JOH*BH>°:<;Q	QKTCWG9M(°J=NFD,	2-L@°29°E0130011
T+-3C+°CBB|H&<-O	DGCD*I@BG°/,AL/1	B8CL°/OH;°/=NGDX	°/OH;°//HGEP°/OH	Ē-J<*N*BG°/DAB/?	JOH*°MYQEC130012
T+-3=°S.-(CCTG9<	B°J=K@Z°¬+°&BB|H	&D%BG°/,AH/178C3°	°/OHĒ-&Y$4*BG°S.	-|<BG°/QG°°4H|°D	¬Y*H°OK8E0130013
T+-49°J=WOH*KY@B	G°/QH°°:°OH*M<>&	A|°D¬Y*HAG@Q6°J-	VG°D¬VOGB°-SC<+°	¬TLS°°-X2U°?°/1+	9G84°4L4E0130014
T+-54FF,2/OT°/1+	9G8QQĒYOG°A/DCH*	L>J=PFH8<°ASBFH8	6°/-?T°%°FHH+°A=	/G9*(°A=/FDG2A°O	<°&4°QDDE0130015
T+-67¬&5>CO°¬Y&	°;&°@ZALT°%°FH8	<°A=/G9)°H-G2°JM	<°JLBFE&<°&7*FE&	<°&5>FEL2/25*N&G	2°JM°R1ME0130016
T+-7DC°DMO//CC°D	(7A/OC°D($//O@Y*	KC°DMO//QC°D(7A/	QC°D($//QCH*L>&	°F|D6°/-1TA°°F|G	°/1&°L:8E0130017
T+-6V++H°G°D(=°C	°/1&8°°°O8A=(+H°	BB¬H&D-CDF<%$&C4	°G84¬Y¬HAG¬HGCOO	DF<%$)°4°G8O¬Y¬H	AB74°$08E0130018
T+-9-°°G°-&96OH*	(GCYAG8%<°A;°CXG	°/1*2+°H¬S"H&CLC	_CV%<AJT<FSX2/O&	@F-9$OH*BFYD°F+°	<°J%°KZME0130019
T+-:$4J?ROH*BFYM	HF°G°/OHS8C|°/08	VOH*M<>°BOH*BE-U	°C1L°/OHĒ&/°RA+°	|<-+_C?"G9U9<°Y	<@/°°MO*E0130020
T+-#ODTCSGB@8°J=	|@ZAR+L°HC|H&A<B	GDXN@°°T"CH<M"-T	"C-°¬WJ-TOH*M<>H	A|JU¬W*°ACD-°80:	4@YD°5ZME0130021

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-@J<33TC,LB°-/	:|D°H"-&&F1YQMLQ	BFBUFDA%ĒFEH<°&	$FT5°B|#°-&#D̄OH*	M<>HAOH*+U%BG°/Y	HOH*°MQ8E0130022
T+-°<°/Q H°"UOH*	BFUHLFJ¬-°CS°°-X	2U°@:B°=++--|ULY	HC972/OO#B°=++O-	|UL%HC94#"1=R+L°	H̄C|H°"K°E0130023
T+-=GDA808/=L+°D	¬U"H&E@BGEC.S°<B	GC4T°/OHS8AC2/OL°	°/1I50;°|R<BGE°Y	@KOT$CE%H5OT$|D%	¬)OO°*&-E0130024
T+-"B)/°6G7¬38°G	A9°=&O;°|RCGUFD#	38-°5°J-/0;Q|D̄?H̄	GCTQAFB|°°&=TOH*	BH>°MC°HH6/T4CE%	H5--°;:HE0130025
T+-"°6%BGEC.S°L4	MG9X2-&Y+°A=RFB|	°/O°HOH*BF/.°/OH	OBO°&L<BG°/ZBEJU	%8°°#"1=R|<-HOO1	FB<H°R3*E0130026
T+/°8B<|°/1&28-G	B°--°O-DH;3QBFBM	6°J-X$°H°°C&BG9%	(°J=$FDT-/°+|D°	HO@BGEC.S°T4RG9X	2-&Y°;RME0130027
T+/A3C-°¬WJ-TOH*	|'%BG°/YKO'*BE-O°	°D|P°/OHĒ&-OR++°	°+&QHC|H&I32CD.Q	@-1B:|H<NVT2DER%	8°-Y°P#YE0130028
T+/B>C|H&DC17D.Q	@)1B:|G*NVT18ER%	<.1=DBB@<M1'MG8&	'"O/8@-D<CG*¬/°/	7C°%¬CA=DO-DH¬<H	BGO°°LK@E0130029
T+/CZCH<H"1=D|E@	NVL1¬ER*@°AOR|°°	NW%BGEC.S°&@°ERM	QHD@°ER*QHO8°ERU	QHO8°ERYQH37"ERP	°°J°°*:0E0130030
T+/DU1*BG°/YKOH*	BE-°(°AF)OH*BFUH	PFM"-°<HBDKO@=1E	M+°HHC|H&C333DN&	8A°Y<@/°DO-HJUT&	BDNH°7/0E0130031
T+/E¬O-DH¬¬HGACQ	AFCM@°JC4¬|@°OH*	M<>H°¬D°°+°H¬U"H̄	&I3&AG9U'6J=ROHD	°°C4°G9X2-L-6°J-	%+°D°#K*E0130032
T+/FĒD|L°UAD%|°°	&'<BGDLL°/1&28°G	°/CHĒOL4R¬;°=C°D	$4J?$OH*BFYMHF°G	°/OHS8C#°/1&28-C	°/OH°O°8E0130033
T+/GNH-°+-|""OH*	BFUD>FĒ?-:%BG°/Y	E+/XVO-D¬QC4"D*?	2°&*@$AG.@Y*D|C@	J2"A@°G°°°M4A°J-	/@YD°*1YE0130034
T+/H&OGXO°|H&JGT	-°|H̄&DXU&°|H̄&CGU	E°|H̄&IG4D°¬HB.AO	AG9*AOH*BG-H¬V1X	3OH*BF%M+F¬|-J|	$F"H°$J-E0130035
T+/I./1/9°&C°UAG	5¬P°AOH&J'LQAFBN	""O.2-&L°/1F7CH*	BFUDGF¬,-°<HAG6°	*°J=P°LQAFBP°/OH	;°/@°LBME0130036
T+/HFV1X=OH*BF-D	DF¬9(°&DQH*°ADT7	°/OHĒE*HAG6°O8A=	SOH*KY@BGDWM4BAH̄	S<+H¬T3-AG8"°UAI	9|B-°NĒYE0130037
T+/.AG94("O-°B°°	(+O-°B°°|°A=)FB|	°/AH̄IOH*°°C&HD,<	@"1=-L&DAFBG°-&°	°G°DL,0E9@°C2D+_	8°-°°$8-E0130038
T+/.@@ZCV|°DL¬JO	AG9*A<+°¬TLS°°-X	2U°?°/1+9G84QĒ?H̄	GB<BGD@U¬TA/DC&	¬YJ=-@-DG|;Q¬W¬H̄	BD%H°=JYE0130039
T+/<7°-S|TA<°FGQ	<°A=-G:G2/0U6°/-	?T°%°FGQ@B/(H|°Y	LĒ*BGD@U¬V1S+C°°	Q-/S+°+°&¬V?H&<°4	AG9*°$98E0130040
T+/(2G:X2°&Ē@&°C	2/3°6°/-?T°Y°FHH	+°A=/G9*(°A=/FDG	2AA-|°A=/FDG2/0@	6°/-?T°Y°FH8<°A=	/G9*°5°ME0130041
T+/+_C-°L¬J-VG°D	¬VOD4°/=RC&D¬V1-	/@YD¬+¬°¬V%°&D7<	8°/=O@/°&|°%LKCO	.D6U'@A=ROHHLG@B	GECH°3ĒUE0130042
T+/|Y°°°6°J-VCH*	KDO°6BA-T(°-L6TQ	HFBM4BA|-(°-L9TQ	HFB<4BA&IC°DL#°°	°C°DL"O°C°DL@°°°	C°°°$H%E0130043

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/&TD#- &-	Q%&@ D#-QH"HBB-Q	- Q%%BGD"| /O	(-M<&OBG:MQ+O@	BG:MQH"HAA@GWEAL	2/OY @34E0130044
T+/J;OH*BH> JOH*	MC%BG < JLBFE-	6BA-T(-MNLQHFB<	4BAR|(DOML&BEV<	< JM| < J=)E&@	9@AM 3OUE0130045
T+/KRC?H&FL/ -,	2U |O~A%8H HH@Z	W< ~XL?CG5C("O- B (+O- B | J=	)FB| /AJ@+~ NC%	&EU& @S*E0130046
T+/LMO; MY~HGD%B	GEV$ /1*2OH*BH>	&CH*MW%BGE Y19A/	F<;QQKTG- 8- H	I@Z D+--NC-OAG9D	NC3- 7Z@E0130047
T+/M|BAM+@Z J|+O	N%L3YG:Y< JMYFFC	2/2D@9AO1|+ ~D-O	AEK-CQT4IB-|2 &O	O8/=|+ D~T%B&E&G	3 Q1%E0130048
T+/NHC D$4J?)C&D	NC1=,@YEM<+ ~T&4	E&@ |HAJ@GWEP<	: J=.C P-ANLOH*	P.%BG /DAGJ%7OH*	BFYM E9DE0130049
T+/OEB/?JOH*BH>	O+A BB?H&F D EDQ	~U<PG S.- O EPH	~U*BG S.- OBG:M	Q+ OAE)&QOTOKE-	<A1% 4Q&E0130050
T+/P JA_DO;HN234	<B-|2 &/%P5'~$	Q<BG /H< JPMFEO	@D1Q C *$JA_E0&	N2OOAE)&QPTOME-	<A1% QS E0130051
T+/P#JA_SO;QN2"H	G(-@BG:MQH@ A C	/1ROCH*OBLYAG8%	< A; E-C /1*2OH*	BFYD$F5. /OHE/&Y	$4* :RYE0130052
T+/Q6/OHS8 CA8AQ	@OH*ON%BGE3H'C&Y	C@YDO+ H~U"F&H*B	G /,AGJV)8 O< J?	JF'? /OHE/&Y$4*B	G SH '$-E0130053
T+/R18 32/OT /1R	COH*P<TMAEVD5 /R	LOH* C&	HE244 JRN<+<~U3X	6G9.2U *98A=L@/B	O+OH #I E0130054
T+/E%G87B JZ<4-D	L~~@ @YF~G OT	* AE& LU G9H9 A=	LOA O;AO E8 BG @	EP/H: /=.<+Q~V&4	AG9M J8QE0130055
T+/$XFD,2--U(J=	NFD32A U<AA%EF;,	2/6H| A=NFD&'FA=	N@Y&X|J ~V~HDE34	(G9P2 -*'AA=N@Y&	IC- 8&@E0130056
T+/*SG9MQ&"HGC08	G9MQ&?HGA-@ G9M	Q<30 G9&| A=NFBX	2--Y+ A=MFB| /1*	BOH*L>J=MF1,2/0Q	+ J* E&DE0130057
T+/)).J-Z(&DON*B	G O81=L(-QGOO	DF/D$)C-HG9C2U Q	<AAYJF6" /1+9G9D	Q%OO FHMQ%OO&FS<	QDC-):HE0130058
T+/;Q /=&@/ FC M	EFAYZ+ &~U|H&A-O	HFS<Q%@BG /,AIJY	T8 C /OH; /=LFT,	/OHE-JDE+T-AG8?	2DG@ 1#OE0130059
T+/~LOH*BFYDUFV8	90A=L@Z **J ~U?H	&EL-DG9.2U # /OH	E-J $F-OAF1*EH&O	AF'D$5*BG /DAB/?	JOH* #J4E0130060
T+/-+ /YNC DP8/;	OH*BH> +A BB?H	&.T-DG9.2UB*@B/~	6|&Y~V|HBD 8 G9&	QH-8 E"QQ.*BGE"M	< /.- #.DE0130061
T+//IE1=MOH*BH>	+OD~S@BG	A H O DA- HD	< AD E& E Q- A	HSZNNPAOE7)#B	H.O- 2S@E0130062
T+/SO~ T"GO)L|C	1FC4Q|1/AE&UN%AP	DG84~T(|I5*N &DA	QMA 5*X15;(&DA	&QMA 8_~AO@N &DA	Q;H '8*E0130063
T+/S"4%XP&+|O&DA	&(|I5*N &DA Q)~	R2)PTM+.PO*|E&DA	&DA 8_.I54CT5UA	&DCN5UCS8@GT9+I	O@- 89DE0130064
T+/T:4U?B9+(&DA	&DA &<|A6)V.4@X	N1MCC8'V.2)N 1)X	RQFCF5_XM&(|E5*~	T2DA &DCT8=('2EC	T~M HE0130065

DATE	25AUG69	31OCT69	28NOV69	02MAR70	01NOV70	19NOV71	PROG ID	OE01-3
EC NO.	816485	816529	816542	816631	816764	818677	PAGE	18

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/U55'XI5;(8@P	S8'~A5@PR&+.E8=|	L2)PG&+|E8>|W5_X	S1MCCO;.E&(~R2)P	T&+|E8>|R2)~P4@N	5'U K&YE0130066
T+/VO2)PT8@PS84C	F5_V 9(PP6;|AO_|	E&<|HO|V 2)N 1<G	TCMCF2*PL1DCB2;(	5)$T&+.E84CW2;|	H&+& O1ME0130067
T+/W,5)~R8&GB4@N	1<GTO*PN8@PR&(~	R8'V.O'LDK@|O1<N	5_V 1<PLO;/ 8@X	M1MCI5MCA1<LRK=.	W~;H "CDE0130068
T+/XW6*PS1;(2<G	L86A-6*PP1*GT&<$	O6MCM5_XEQFCE5;|	E6GCO@|COG+|O&<.	E1@XN&<PX1*|U8@X	O5*U 9Q@E0130069
T+/Y/5;PL1D?C5<J	9=~X9@PN8'XI1;.	X9=~X4&GS84CC5_L	MO)PDQFCL1*$T&DC	N5_PE&DA &DA &DA	&D EC8E0130070
T+/Z*&DA &DA &DC	S8@GT9+I O>TT1;I	&DA &(~R2)$R2;|	Y&<PR6MCB2;(2;I	&DA &DA &DA &DA	&D #.8E0130071
T+/DP&D - LC2<G	I5MCS:(PC&<|H4U_	D E2)PC6MCS:(P	CQ;.L2)) &A A%X	NO'V 1%GI4=LR1MC	C2(H 5D@E0130072
T+/,KA I2<GM5<P	R&<PC2(R O@TKKOH	B%GN:DCHO)LM6MC	O5MCC2(H H ~H5(V	.8@TE6)LA44CC2(I	.- 1RME0130073
T+/%(*|A6)V.8>T	NO4CC2(I.&DA .	CO)XRK=.PO*|E&<|	H4U_ H C1_$R5+I	4*GM&<|H4U_ &|"	HO)& RK<E0130074
T+/_H5<PR&(PGK4A	&DA &|P2@|(5)$	T&<.U8>/ 0*$T1)V	8%XO&<GC5=|D'~.	O@4A &DA &DA &DC	B9+H @30E0130075
T+/>C:DCT5_R 4'$	N1@|A6)XIO*~E5'X	I5;|E6MA O>LF1%P	R&(XI1@TT4@PF84C	C5<J.1<PC5%LE&<P	R6)Q =$ME0130076
T+/>=6)LA4%N '~.	O@4A &DA 6*PA1+T	5@?C3&<XS&(XD:F?	S2<J.O%N 5)$T&(X	D:|P2@|(O>LS:DC	W2<M NROE0130077
T+/?95MCN5>(6*L	Y5=|RK@|H64_ &|G	O@~G1@"G4@~$1' "G	9'~.O@4CI8UCN5>(	6*LYE=.H1D?B1MC	R1+- LCYE0130078
T+/O4'~.O@4A &DA	&DA &DA &DA &<X	S&<.U8>/,5)R O'L	DK@XS8>LE1DA 1<G	TO*XMO*~E&DA &DA	O*& :-ME0130079
T+/1?1(V.6*PGK'|	I5UCE6)XI8UA &DA	&+.H1D?B1MA &DA	5)R-5_) 4@GTO@/	8%PT&+$I8@/ 5)R	8%U K1&E0130080
T.A2*5UCI8>.U1*L	C2<GI5MCC2(I.E@X	MO*~E&EA O@TA2)N	1(R 5)$T&<GG6*P	E	D:<E0130081
TH1= .			"O		5&YE0130082
T+J"R 9 G	S + 8-C- ;H 8 .	S + C8-GS >HC8-C	UD;QC9-D +&D8 G	UN; A9GC- ; B8 | -	'9ME0130083
E"#"'*E7*=~DC"PH$	="7M&F| | C	F% ASC R A	SO Q	21231012711	11071"$@E0130084

LAST PAGE

DATE	25AUG69	31OCT69	28NOV69	02MAR70	01NOV70	19NOV71	PROG ID	OE01-3
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E025 5203 LINE PRINTER FUNCTION TESTS

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                           2 *
                           3         DECK  4                                  LAST CHG:01 27 75
                           4         SEQ   0
   0A00                    5 UVWXYZ  START X'A00'
                           6         TREP
                           7 ********************************************************************
                           8 *                                                                  *
                           9 *       SYSTEM/3 5203 LINE PRINTER FUNCTION TESTS                  *
                          10 *                                                                  *
                          11 ********************************************************************
                          12 *       SECTION 2 - ROUTINES 1 & 2                                 *
                          13 ********************************************************************
   0A00 E025        0A01  14         DC    XL2'E025'          PROGRAM IDENTIFICATION
   0A02 00          0A02  15         DC    XL1'0'             FLAGS
   0A03 01          0A03  16 RNUM    DC    XL1'1'             CURRENT ROUTINE NUMBER
   0A04 0000        0A05  17         DC    XL2'0'             RESERVED
   0A06 0A10        0A07  18         DC    AL2(RTN1)          ADDRESS OF FIRST ROUTINE PREFIX
   0A08 163D        0A09  19         DC    AL2(ERT1)          ADDRESS OF ERROR RECORDING TABLE
   0A0A E04000      0A0C  20 SPUDT   DC    XL3'E04000'        UNIT DEFINITION TABLE - PRINTER
   0A0D 101000      0A0F  21 SPUTA   DC    XL3'101000'        PRINTER KEYBOARD
                          22 ********************************************************************
                          23 *
                          24 *       ROUTINE 1 - SENSE COMMANDS ANALYSIS TEST                   *
                          25 *                                                                  *
                          26 ********************************************************************
   0A10 01          0A10  27 RTN1    DC    XL1'1'             ROUTINE NUMBER
   0A11 80          0A11  28         DC    XL1'80'            FLAGS - MANUAL INTERVENTION
   0A12 0C81        0A13  29         DC    AL2(RTN2)          ADDRESS OF NEXT ROUTINE PREFIX
                          30 ********************************************************************
   0A14 38 04 0209        31         TBN   SBYTE0,SSW05       TEST FOR ALTERNATE PRINT DEVICE
   0A18 F2 90 12          32         JF    SKALT
   0A1B C0 87 021A        33         B     PRINT              PRINT 'SENSE CMDS ANALYSIS TEST'
   0A1F 42          0A1F  34         DC    XL1'42'
   0A20 18          0A20  35         DC    IL1'24'
   0A21 12C3        0A22  36         DC    AL2(TITLE1)
   0A23 E0E2        0A24  37         DC    XL2'E0E2'
   0A25 C0 87 021A        38         B     PRINT              *
   0A29 01          0A29  39         DC    XL1'01'            PRINT 'JMPR A-B1E5D10 TO A-B1D2S05,
   0A2A 54          0A2A  40         DC    IL1'84'             RESTORE CARRIAGE(S), PRESS CHK
   0A2B 150A        0A2C  41         DC    AL2(RELORC)          RESET, THEN RESET HALT'
   0A2D F0 7C 76          42 SKALT   HPL   X'76',X'7C'         HALT E2: PREPARE PRINTER
   0A30 3D FF 0878        43         CLI   UCSFLG,X'FF'         120 CHAR. SET
   0A34 F2 01 04          44         JNE   MARCS
   0A37 3C 00 129A        45         MVI   EXPD3,X'00'          PUT '00' IN STATUS BYTE
   0A3B 39 01 0ACC        46 MARCS   TBF   SPUDT,X'01'          DUAL FEED CARR.
   0A3F F2 10 08          47         JT    DOENSE
   0A42 3C 01 1294        48         MVI   EXPD3,X'01'          PUT '01' IN RIGHT CARRIAGE LOCATION
   0A46 C0 87 0212        49         B     TEST                 READ DATA SWITCHES
                          50 ********************************************************************
                          51 *    DO FOUR SENSE COMMANDS                                        *
                          52 ********************************************************************
   0A4A 30 E0 129D        53 DOENSE  SNS   SENS0,X'E0'         GET LINE LOCATIONS
   0A4E 30 E1 129F        54         SNS   SENS1,X'E1'         GET INCRM.& C.C.CTR.
   0A52 30 E2 12A1        55         SNS   SENS2,X'E2'         GET TIMINGS
   0A56 30 E3 12A3        56         SNS   SENS3,X'E3'         GET STATUS
   0A5A 38 31 12A0        57         SBF   SENS2-1,B'110001'   IGNORE CHAIN EMIT,PSS-1 & HOME LATCH
   0A5E 38 01 12A3        58         SBF   SENS3,B'1'          IGNORE CE SENSE BIT
   0A62 C2 01 1293        59         LA    EXPTAB,XR1          LOAD TABLE ADDR.
   0A66 C2 02 129C        60         LA    SENTAB,XR2          LOAD TABLE ADDR.
   0A6A 0C 01 162A 1263   61         MVC   EB2ERC(2),ZERO      ZERO ERR COUNTERS
   0A70 38 68 1628        62         SBF   TAGS,X'68'          RESET A CMD CORRECT & CMD.ERR FLAGS
   0A74 6D 01 01 01       63 SENEXT  CLC   1(2,XR1),1(,XR2)    ACTUAL SENSE MATCH EXPECTED
   0A78 F2 01 67          64         JNE   ANERR
   0A7B 3A 20 1628        65         SBN   TAGS,TAG2           SET A CMD. CORRECT FLAG
   0A7F 0D 01 162A 1263   66         CLC   EB2ERC(2),ZERO      ANY BYTES IN ERR YET
   0A85 F2 01 8F          67         JNE   WFROM               IF NOT KEEP GOIN'
   0A88 36 01 1269        68 GORGAN  A     TWO,XR1             ADD TWO FOR NEXT CMD.
   0A8C 36 02 1269        69         A     TWO,XR2             ADD TWO FOR NEXT CMD.
```


E025 5203 LINE PRINTER FUNCTION TESTS

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   0A90 7D FF 00          70         CLI   0(,XR1),X'FF'        CHECKED ALL CMDS
   0A93 C0 01 0A74        71         BNE   SENEXT
   0A97 38 20 1628        72         TBN   TAGS,TAG2            ALL CMDS.CORRECT
   0A9B C0 90 0AAA        73         BF    ALBAD
   0A9F 38 40 1628        74         TBN   TAGS,TAG1
   0AA3 C0 90 0CA0        75         BF    SYNARA
   0AA7 F2 87 6D          76         J     WFROM
                          77 ********************************************************************
                          78 *    ALL SENSE COMMANDS FAILED                                     *
                          79 ********************************************************************
   0AAA 3C F2 152D        80 ALBAD   MVI   WCHEB,X'F2'          PUT EB2 IN MSG.
   0AAE 3D 00 1629        81         CLI   EB1ERC,X'00'         ANY EB1 ERRS
   0AB2 F2 81 1C          82         JE    SKIBIT               IF NOT
   0AB5 3C F1 152D        83         MVI   WCHEB,X'F1'          PUT EB1 IN MSG.
   0AB9 3D 00 162A        84         CLI   EB2ERC,X'00'         ANY EB2 ERRORS
   0ABD F2 81 11          85         JE    SKIBIT
   0AC0 3C 41 0C1A        86         MVI   IDALT,X'41'          SET HALT ID
   0AC4 C0 87 021A        87         B     PRINT                PRINT 'ALL SENSE CMDS FAILED'
   0AC8 C2          0AC8  88         DC    XL1'C2'
   0AC9 15          0AC9  89         DC    IL1'21'
   0ACA 151F        0ACB  90         DC    AL2(ALSCF)
   0ACC E041        0ACD  91         DC    XL2'E041'
   0ACE F2 87 54          92         J     OUTLOG               GOLOG OUT ACTUAL&EXPECTED BYTES
   0AD1 3C 42 0C1A        93 SKIBIT  MVI   IDALT,X'42'
   0AD5 C0 87 021A        94         B     PRINT
   0AD9 C2          0AD9  95         DC    XL1'C2'
   0ADA 34          0ADA  96         DC    IL1'52'
   0ADB 153E        0ADC  97         DC    AL2(CNLBYT)
   0ADD E042        0ADE  98         DC    XL2'E042'
   0ADF F2 87 43          99         J     OUTLOG               GO LOG OUT
                         100 ********************************************************************
                         101 *    ACTUAL DOES NOT MATCH EXPECTED                                *
                         102 ********************************************************************
   0AE2 6D 00 01 01       103 ANERR  CLC   1(1,XR1),1(,XR2)     IS THE EB1 BYTE IN ERR
   0AE6 F2 81 0D          104        JE    MUSBTU
   0AE9 0E 00 1629 1267   105        ALC   EB1ERC(1),ONE        ADD TO EB1   IN ERR
   0AEF 6D 00 00 00       106        CLC   0(1,XR1),0(,XR2)     IS THE EB2 BYTE IN ERR
   0AF3 F2 81 06          107        JE    ANBAD
   0AF6 0E 00 162A 1267   108 MUSBTU ALC   EB2ERC(1),ONE        ADD TO EB2 IN ERR
   0AFC 38 40 1628        109 ANBAD  TBN   TAGS,TAG1           ANY ERRS YET?
   0B00 F2 90 07          110        JF    SEEF
   0B03 3A 08 1628        111        SBN   TAGS,TAG4
   0B07 F2 87 09          112        J     ANYGUD
   0B0A 3A 40 1628        113 SEEF   SBN   TAGS,TAG1           SET ERR FLAG
   0B0E 2C 01 154B 09     114        MVC   EDOC(2),9(,XR2)      PUT CMD.CODE IN MSG.
   0B13 C0 87 0A88        115 ANYGUD B     GORGAN
   0B17 3C 43 0C1A        116 WFROM  MVI   IDALT,X'43'
   0B1B C0 87 021A        117        B     PRINT                PRINT THE SENSE CODE IN ERR
   0B1F C2          0B1F  118        DC    XL1'C2'
   0B20 14          0B20  119        DC    IL1'20'
   0B21 1552        0B22  120        DC    AL2(SCOIE)
   0B23 E043        0B24  121        DC    XL2'E043'
                         122 ********************************************************************
                         123 *    LOG OUT ALL COMMANDS WITH ACTUAL AND EXPECTED BYTES           *
                         124 ********************************************************************
   0B25 C2 01 1293        125 OUTLOG LA    EXPTAB,XR1           LOAD TABLE ADDR.
   0B29 C2 02 129C        126        LA    SENTAB,XR2           LOAD TABLE ADDR.
   0B2D 2C 01 1564 09     127 SCARD  MVC   LFTCOD(2),9(,XR2)    PUT CMD.CODE IN MSG
   0B32 2C 01 156F 0B     128        MVC   RYTCOD(2),11(,XR2)   PUT CMD.CODE IN MSG
   0B37 34 01 0B41        129        ST    LEX2,XR1
   0B3B C0 87 021E        130        B     UNPACK
   0B3F 01          0B3F  131        DC    IL1'1'               PUT LEFT EXP.EB2 IN MSG.
   0B40 0000        0B41  132 LEX2   DC    AL2(*-*)             FROM
   0B42 15A0        0B43  133        DC    AL2(LEXEB2)          TO
   0B44 36 01 1267        134        A     ONE,XR1              ADD 1 TO TABLE ADDR.
   0B48 34 01 0B52        135        ST    LEX1,XR1             STORE FROM ADDR.
   0B4C C0 87 021E        136        B     UNPACK               PUT LEFT EXP.EB1 IN MSG.
   0B50 01          0B50  137        DC    IL1'1'
```

E025 5203 LINE PRINTER FUNCTION TESTS

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    0B51 0000             0B52  138 LEX1   DC     AL2(*-*)              FROM
    0B53 15A3             0B54  139        DC     AL2(LEXEB1)           TO
    0B55 36 01 1267             140        A      CNE,XR1               ADD 1 TO TABLE ADDR
    0B59 34 01 0B63             141        ST     REX2,XR1
    0B5D C0 87 021E             142        B      UNPACK                PUT RIGHT EXP.EB2 IN MSG.
    0B61 01               0B61  143        DC     IL1'1'
    0B62 0000             0B63  144 REX2   DC     AL2(*-*)              FROM
    0B64 15AB             0B65  145        DC     AL2(REXEB2)           TO
    0B66 36 01 1267             146        A      CNE,XR1               ADD 1
    0B6A 34 01 0B74             147        ST     REX1,XR1
    0B6E C0 87 021E             148        B      UNPACK                PUT RIGHT EXP.EB1 IN MSG
    0B72 01               0B72  149        DC     IL1'1'
    0B73 0000             0B74  150 REX1   DC     AL2(*-*)              FROM
    0B75 15AE             0B76  151        DC     AL2(REXEB1)           TO
    0B77 36 01 1267             152        A      CNE,XR1               ADD 1
    0B7B 34 02 0B85             153        ST     LAC2,XR2
    0B7F C0 87 021E             154        B      UNPACK                PUT LEFT ACT.EB2 IN MSG
    0B83 01               0B83  155        DC     IL1'1'
    0B84 0000             0B85  156 LAC2   DC     AL2(*-*)              FROM
    0B86 15C0             0B87  157        DC     AL2(LACEB2)           TO
    0B88 36 02 1267             158        A      ONE,XR2               ADD 1
    0B8C 34 02 0B96             159        ST     LAC1,XR2
    0B90 C0 87 021E             160        B      UNPACK                PUT LEFT ACT.EB1 IN MSG
    0B94 01               0B94  161        DC     IL1'1'
    0B95 0000             0B96  162 LAC1   DC     AL2(*-*)              FROM
    0B97 15C3             0B98  163        DC     AL2(LACEB1)           TO
    0B99 36 02 1267             164        A      CNE,XR2               ADD 1
    0B9D 34 02 0BA7             165        ST     RAC2,XR2
    0BA1 C0 87 021E             166        B      UNPACK                PUT RIGHT ACT.EB2 IN MSG
    0BA5 01               0BA5  167        DC     IL1'1'
    0BA6 0000             0BA7  168 RAC2   DC     AL2(*-*)              FROM
    0BA8 15CB             0BA9  169        DC     AL2(RACEB2)           TO
    0BAA 36 02 1267             170        A      CNE,XR2               ADD 1
    0BAE 34 02 0BB8             171        ST     RAC1,XR2
    0BB2 C0 87 021E             172        B      UNPACK                PUT RIGHT ACT.EB1 IN MSG.
    0BB6 01               0BB6  173        DC     IL1'1'
    0BB7 0000             0BB8  174 RAC1   DC     AL2(*-*)              FROM
    0BB9 15CE             0BBA  175        DC     AL2(RACEB1)           TO
    0BBB 36 02 1267             176        A      CNE,XR2
    0BBF 38 20 0A0E             177        TBN    SPUTA-1,B'100000'     PRINTER KEYBOARD ASSIGNED
    0BC3 F2 10 12               178        JT     PR4LI
    0BC6 38 04 0208             179        TBN    SBYTE0,SSW05          PRINT ON ALTERNATE DEVICE
    0BCA F2 90 0B               180        JF     PR4LI
    0BCD C0 87 021A             181        B      PRINT                 PRINT CMD CODES AND ACT.&EXP.DATA
    0BD1 81               0BD1  182        DC     XL1'81'
    0BD2 7B               0BD2  183        DC     IL1'123'
    0BD3 15CE             0BD4  184        DC     AL2(RACEB1)
    0BD5 F2 87 20               185        J      ALCCP
    0BD8 C0 87 021A             186 PR4LI  B      PRINT                 PRINT SENSE CODE NAMES
    0BDC 81               0BDC  187        DC     XL1'81'
    0BDD 1C               0BDD  188        DC     IL1'28'
    0BDE 156F             0BDF  189        DC     AL2(RYTCOD)
    0BE0 C0 87 021A             190        B      PRINT                 PRINT SENSE CODE BYTES
    0BE4 81               0BE4  191        DC     XL1'81'
    0BE5 1D               0BE5  192        DC     IL1'29'
    0BE6 158F             0BE7  193        DC     AL2(BTES)
    0BE8 C0 87 021A             194        B      PRINT                 PRINT EXPECTED SENSE INFO
    0BEC 81               0BEC  195        DC     XL1'81'
    0BED 1C               0BEC  196        DC     IL1'28'
    0BEE 15AE             0BEF  197        DC     AL2(REXEB1)
    0BF0 C0 87 021A             198        B      PRINT                 PRINT ACTUAL SENSE INFO
    0BF4 82               0BF4  199        DC     XL1'82'
    0BF5 1C               0BF5  200        DC     IL1'28'
    0BF6 15CE             0BF7  201        DC     AL2(RACEB1)
    0BF8 7D FF 00               202 ALCOP  CLI    0(,XR1),X'FF'         ALL 4 CMDS PRINTED
    0BFB C0 01 0B2D             203        BNE    SCARD
    0BFF 0C 01 14A6 14B2        204        MVC    MAP(2),CHT13          PUT CHART NO.IN MSG.
    0C05 C0 87 021A             205        B      PRINT                 PRINT PRINTER MAP CHART NO.
```


E025 5203 LINE PRINTER FUNCTION TESTS

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    0C09 81               0C09  206        DC     XL1'81'
    0C0A 12               0C0A  207        DC     IL1'18'
    0C0B 14AE             0C0C  208        DC     AL2(ENT)
    0C0D C0 87 021A             209        B      PRINT                 PRINT 'REMOVE JUMPER'
    0C11 85               0C11  210        DC     XL1'85'
    0C12 0D               0C12  211        DC     IL1'13'
    0C13 15E9             0C14  212        DC     AL2(OKSEN)
    0C15 C0 87 0222             213 ZALT   B      HALT                  SENSE ERR HALT
    0C19 E000             0C1A  214 IDALT  DC     XL2'E000'
    0C1B 38 10 020A             215        TBN    SBYTE2,SSW13          SSW -13  ON (NO ALT.PRTR.) ?
    0C1F F2 90 8B               216        JF     LEAVIT
    0C22 3D 43 0C1A             217        CLI    IDALT,X'43'           WAS THE ERR A '43' HALT ?
    0C26 F2 01 81               218        JNE    TIVA
    0C29 38 08 1628             219        TBN    TAGS,TAG4             IS ONLY 1 SENSE IN ERR
    0C2D F2 90 09               220        JF     JUSUN
    0C30 C0 87 0222             221        B      HALT                  MORE THAN 1 SENSE CODE
    0C34 E083             0C35  222        DC     XL2'E083'             IN ERROR HALT
    0C36 F2 87 71               223        J      TIVA
    0C39 3D F2 154B             224 JUSUN  CLI    EDOC,C'2'             IS ERR CODE E2 ?
    0C3D F2 01 C9               225        JNE    AVID
    0C40 C0 87 0222             226        B      HALT                  SENSE CODE 'E2' FAILED
    0C44 E08A             0C45  227        DC     XL2'E08A'
    0C46 F2 87 61               228        J      TIVA
    0C49 3D F3 154B             229 AVID   CLI    EDOC,C'3'             IS ERR CODE E3 ?
    0C4D F2 01 09               230        JNE    SNOTIT
    0C50 C0 87 0222             231        B      HALT                  SENSE CODE E3 FAILED
    0C54 E08C             0C55  232        DC     XL2'E08C'
    0C56 F2 87 51               233        J      TIVA
    0C59 3C 84 0C9C             234 SNOTIT MVI    KORP,X'84'            PUT IN EB1 ONLY HALT
    0C5D 3D F0 154B             235        CLI    EDOC,C'0'
    0C61 F2 01 19               236        JNE    MUBEUN                IF NOT,MUST BE CODE E1
    0C64 3D 00 162A             237        CLI    EB2ERC,X'00'          ANY EB2 ERRS ?
    0C68 F2 81 2C               238        JE     PORK                  IF NOT,EB1 ERRS ONLY
    0C6B 3C 85 0C9C             239        MVI    KORP,X'85'            PUT IN EB2 ONLY HALT
    0C6F 3D 00 1629             240        CLI    EB1ERC,X'00'          ANY EB1 ERRS ?
    0C73 F2 81 21               241        JE     PORK                  IF NOT,EB2 ERRS ONLY
    0C76 3C 86 0C9C             242        MVI    KORP,X'86'            IF SO,EB1 & EB2 ERRS
    0C7A F2 87 1A               243        J      PORK
    0C7D 3C 87 0C9C             244 MUBEUN MVI    KORP,X'87'            PUT IN EB1 ONLY HALT
    0C81 3D 00 162A             245        CLI    EB2ERC,X'00'          ANY EB2 ERRS
    0C85 F2 81 0F               246        JE     PORK                  IF NOT,EB1 ERRS ONLY
    0C88 3C 88 0C9C             247        MVI    KORP,X'88'            PUT IN EB2 ONLY HALT
    0C8C 3D 00 1629             248        CLI    EB1ERC,X'00'          ANY EB1 ERRS
    0C9C F2 81 04               249        JE     PORK                  IF NOT,MUST BE EB2 ERRS ONLY
    0C93 3C 89 0C9C             250        MVI    KORP,X'89'            IF SO,EB1 & EB2 ERRS
    0C97 C0 87 0222             251 PORK   B      HALT                  E0 OR E1 FAILED HALTS
    0C9B E000             0C9C  252 KORP   DC     XL2'E000'
    0C9D F2 87 0A               253        J      TIVA
    0CA0 C0 87 021A             254 SYNARA B      PRINT                  PRINT 'SENSE CMDS OK, REMOVE JUMPER'
    0CA4 41               0CA4  255        DC     XL1'41'
    0CA5 1B               0CA5  256        DC     IL1'27'
    0CA6 15E9             0CA7  257        DC     AL2(OKSEN)
    0CA8 E000             0CA9  258        DC     XL2'E000'
    0CAA F0 7C 57               259 TIVA   HPL    X'57',X'7C'            HALT E3: REMOVE JUMPER
    0CAD C0 87 0216             260 LEAVIT B      LINK
                                261
                                262 ****************************************************************
                                263 *                                                              *
                                264 *      ROUTINE 2 - SENSE TIMING BITS (CODE E2) TEST            *
                                265 *                                                              *
                                266 ****************************************************************
    0CB1 02               0CB1  267 RTN2   DC     XL1'2'                 ROUTINE NUMBER
    0CB2 80               0CB2  268        DC     XL1'80'                FLAGS - MANUAL INTERVENTION
    0CB3 FFFF             0CB4  269        DC     XL2'FFFF'              LAST ROUTINE
                                270 ****************************************************************
    0CB5 3C E2 0CEE             271        MVI    WICAR-1,X'E2'
    0CB9 0C 04 1602 147D        272        MVC    LRCAR(5),TFEL          PUT LEFT IN MSG.
    0CBF C1 E0 0CC6             273        TIO    BAPRT,NRDY
```

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ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

    0CC3 F2 87 14                 274         J      PTITL
    0CC6 38 04 0208               275 BAPRT   TBN    SBYTEO,SSW05          PRINT ON ALTERNATE DEVICE
    0CCA F2 90 0A                 276         JF     JALT
    0CCD C0 87 021A               277         B      PRINT
    0CD1 46                  0CD1 278         DC     XL1'46'               PRINT MAKE READY ETC.
    0CD2 1F                  0CD2 279         DC     IL1'31'
    0CD3 149C                0CD4 280         DC     AL2(RESALT)
    0CD5 E0E1                0CD6 281         DC     XL2'E0E1'
    0CD7 F0 7C 03                 282 JALT    HPL    X'03',X'7C'
    0CDA C0 87 021A               283 PTITL   B      PRINT
    0CDE 42                  0CDE 284         DC     XL1'42'               PRINT TITLE
    0CDF 16                  0CDF 285         DC     IL1'22'
    0CE0 1209                0CE1 286         DC     AL2(TITL2)
    0CE2 E000                0CE3 287         DC     XL2'E000'
    0CE4 0C 0E 088A 12F4          288 SNIRP   MVC    LPD+14(15),POPSUD     SET LINE OF PRINT
    0CEA C0 87 0EE8               289         B      XIO                   ISSUE PRINT AND SPACE 1
    0CEE E201                0CEF 290 WICAR   DC     XL2'E201'
    0CF0 0C 03 1631 1265          291         MVC    BTSOFF(4),EFFS        SET SAVE AREA'S TO ZEROS & F'S
    0CF6 0C 01 163F 1282          292         MVC    MSECS(2),UNSEC        SET LOOP COUNT OF 7200
                                  293 *** THE FOLLOWING IS A 140 USEC. LOOP
    0CFC 30 E2 1637               294 SEGAN   SNS    STAT2,X'E2'           SENSE TIMINGS
    0D00 0C 0C 0D0D 1637          295         MVC    OREB1+1(1),STAT2      PUT EB1 IN OR INSTR.
    0D06 0C 00 0D11 1636          296         MVC    OREB2+1(1),STAT2-1    PUT EB2 IN OR INSTR.
    0D0C 3A 00 162F               297 OREB1   SBN    BTSON,*-*             OR EB1 INTO ON SAVE AREA
    0D10 3A 00 162E               298 OREB2   SBN    BTSCN-1,*-*           OR EB2 INTO ON SAVE AREA
    0D14 0C 01 1633 127E          299         MVC    CMPLNT(2),SFFE        SET ALL BITS ON
    0D1A 0F 01 1633 1637          300         SLC    CMPLNT(2),STAT2       GET THE COMPLIMENT OF THE SENSE
    0D20 0C 00 002D 1633          301         MVC    ANEB1+1(1).CMPLNT     PUT EB1 COMPLIMENT IN AND INSTR.
    0D26 0C 00 0031 1632          302         MVC    ANEB2+1(1),CMPLNT-1   PUT EB2 COMPLIMENT IN AND INSTR.
    0D2C 3B 00 1631               303 ANEB1   SBF    BTSOFF,*-*            AND EB1 INTO SAVE AREA
    0D30 3B 00 1630               304 ANEB2   SBF    BTSCFF-1,*-*          AND EB2 INTO SAVE AREA
    0D34 0F 01 163F 1267          305         SLC    MSECS(2),ONE          DECR. LOOP COUNT
    0D3A C0 01 0CFC               306         BNZ    SEGAN
                                  307 ************************************************************************
                                  308 *     CHECK FOR ANY BITS NOT ON AND OFF                                *
                                  309 ************************************************************************
    0D3E 3B 10 1628               310         SBF    TAGS,TAG3             RESET ERR PRINTED FIAG
    0D42 3C 78 CD6D               311         MVI    TBCN,X'78'            SET TO CHECK FOR BITS ON
    0D46 3C 78 0E08               312         MVI    NOBET,X'78'            '' ''    ''    ''    '' ''
    0D4A C2 01 162D               313         LA     BTSCN-2,XR1           LOAD SAVED BITS ADDR.
    0D4E 3C F2 1614               314 TRAM    MVI    OFBYTE,C'2'           SET MSG.FOR EB2 BYTE
    0D52 3C 04 CD67               315         MVI    COCOD+1,X'04'         SET TO SKIP BIT 5 OF EB2
    0D56 36 01 1267               316 DOEB1   A      ONE,XR1               ADD 1 TO SAVE ADDR.
    0D5A 3C 01 0D6E               317         MVI    TBON+1,X'01'          SET INSTR.TO START AT BIT 7
    0D5E C2 02 161F               318         LA     TABBIT-1,XR2          LOAD BIT NO.ADDR.
    0D62 36 02 1267               319 TENXT   A      ONE,XR2               ADD 1 TO BIT NO.ADDR.
    0D66 3D 04 0D6E               320 COCOD   CLI    TBCN+1,X'04'          SKIP BIT 5 OF EB2
    0D6A F2 81 06                 321         JE     NITNOC
    0D6D 78 00 00                 322 TBCN    TBN    0(,XR1),*-*           IS BIT ON OR OFF
    0D70 F2 90 37                 323         JF     BIBAD
    0D73 0E 00 0D6E 0D6E          324 NITNCC  ALC    TBCN+1(1),TBON+1      DOUBLE TO MOVE MASK BIT LEFT 1 POS.
    0D79 C0 82 0D62               325         BL     TENXT                 BR TILL 8 BITS CHECKED
    0D7D 3D F1 1614               326         CLI    OFBYTE,C'1'           EB1 BYTE DONE YET ?
    0D81 F2 81 0C                 327         JE     CHOFF
    0D84 3C F1 1614               328         MVI    OFBYTE,C'1'           SET  MSG.FOR EB1 BYTE
    0D88 3C 00 0D67               329         MVI    COCOD+1,X'00'         SET TO CHK.BIT 5 OF EB1
    0D8C C0 87 0D56               330         B      DOEB1                 BR TO START EB1
    0D90 38 10 1628               331 CHOFF   TBN    TAGS,TAG3             ANY ERRS BEEN PRINTED?
    0D94 F2 10 4A                 332         JT     STALT                 IF YES,GO HALT
    0D97 3D 79 0D6D               333         CLI    TBON,X'79'            CHECKED FOR BITS OFF YET
    0D9B F2 81 B0                 334         JE     SEIFDF
    0D9E 3C 79 0D6D               335         MVI    TBCN,X'79'            SET TO CHECK BITS OFF
    0DA2 3C 79 CE08               336         MVI    NOBET,X'79'           SET TO CHECK BIT OFF
    0DA6 C0 87 0D4E               337         B      TRAM
                                  338 ************************************************************************
                                  339 *     PRINT SENSE TIMING BITS FAILING                                  *
                                  340 ************************************************************************
    0DAA 2C 00 160D 00            341 BIBAD   MVC    BADBIT(1),0(,XR2)     PUT BIT NO.IN MSG.
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ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

    0DAF 38 10 1628               342         TBN    TAGS,TAG3             HAS AN ERR BEEN PRINTED YET?
    0DB3 F2 10 1F                 343         JT     SKIHED
    0DB6 3A 10 1628               344         SBN    TAGS,TAG3             SET ERR PRINTED FLAG
    0DBA 0C 00 163C 1614          345         MVC    ERT1-1(1),OFBYTE      SAVE BYTE
    0DC0 0C 00 0E09 0D6E          346         MVC    NOBET+1(1),TBON+1     SAVE BIT
    0DC6 2C 00 163D 00            347         MVC    ERT1(1),0(,XR2)       SAVE BIT IN PRINTABLE DEC.
    0DCB C0 87 021A               348         B      PRINT                 PRINT SENSE CODE
    0DCF C1                  0DCF 349         DC     XL1'C1'
    0DD0 1F                  0DD0 350         DC     IL1'31'
    0DD1 1608                0DD2 351         DC     AL2(SENCO)
    0DD3 E045                0DD4 352         DC     XL2'E045'
    0DD5 C0 87 021A               353 SKIHED  B      PRINT                 PRINT BIT AND BYTE FAILED
    0DD9 81                  0DD9 354         DC     XL1'81'
    0DDA 17                  0DDA 355         DC     IL1'23'
    0DDB 161F                0DDC 356         DC     AL2(FAILED)
    0DDD C0 87 0D73               357         B      NITNOC
    0DE1 0C 01 14A6 14B2          358 STALT   MVC    MAP(2),CHT13          PUT IN MAP NO.
    0DE7 C0 87 021A               359         B      PRINT                 PRINT MAP NO.
    0DEB 81                  0DEB 360         DC     XL1'81'
    0DEC 12                  0DEC 361         DC     IL1'18'
    0DED 14AE                0DEE 362         DC     AL2(ENT)
    0DEF C0 87 021A               363         B      PRINT                 SPACE 6
    0DF3 96                  0DF3 364         DC     XL1'96'
    0DF4 C0 87 0222               365         B      HALT                  SENSE TIMING BIT FAILED HALT
    0DF8 E045                0DF9 366         DC     XL2'E045'
    0DFA 38 10 020A               367         TBN    SBYTE2,SSW13          SSW - 13  CN(NO ALT.PRTR.) ?
    0DFE F2 90 4D                 368         JF     SEIFDF
    0E01 3D F2 163C               369         CLI    ERT1-1,C'2'           1ST ERR IN EB2
    0E05 F2 01 0F                 370         JNE    SEBUN
    0E08 78 00 00                 371 NOBET   TBN    0(,XR1),*-*            SAME BIT IN EB1 ON OR OFF ?
    0E0B F2 10 26                 372         JT     SEBTU
    0E0E C0 87 0222               373         B      HALT                  SAME BIT FAILED IN EB1 & EB2
    0E12 E02A                0E13 374         DC     XL2'E02A'
    0E14 F2 87 37                 375         J      SEIFDF
    0E17 3C 1F 0E30               376 SEBUN   MVI    BUNALT,X'1F'          START HALT CODES FOR EB1
    0E1B 0E 00 0E30 1267          377 DORP    ALC    BUNALT(1),ONE         INCREMENT HALT CODE
    0E21 07 00 163D 1284          378         SZ     ERT1(1),DECCNE(1)     DECREMENT BIT NO.
    0E27 C0 02 0E1B               379         BNL    DORP
    0E2B C0 87 0222               380         B      HALT                  GIVE EB1 BIT HALT
    0E2F E000                0E30 381 BUNALT  DC     XL2'E000'             20 THRU 27 POSSIBLE
    0E31 F2 87 1A                 382         J      SEIFDF
    0E34 3C 8F 0E4D               383 SEBTL   MVI    BOTALT,X'8F'          START HALT CODES FOR EB2
    0E38 0E 00 0E4D 1267          384 PROD    ALC    BOTALT(1),ONE         INCREMENT HALT CODE
    0E3E 07 00 163D 1284          385         SZ     ERT1(1),DECONE(1)     DECREMENT BIT NO.
    0E44 C0 02 0E38               386         BNL    PROD
    0E48 C0 87 0222               387         B      HALT                  GIVE EB2 BIT HALT
    0E4C E000                0E4D 388 BOTALT  DC     XL2'E000'             90 THRU 97(EXCEPT 95) POSSIBLE
    0E4E 38 01 0A0C               389 SEIFDF  TBN    SPUDT,X'01'            DUAL FEED CAR..
    0E52 F2 90 15                 390         JF     CLINK
    0E55 3D EA 0CEE               391         CLI    WICAR-1,X'EA'          DUAL FEED BEEN TESTED
    0E59 F2 81 0E                 392         JE     CLINK
    0E5C 3C EA 0CEE               393         MVI    WICAR-1,X'EA'          SET CMD.FCR DUAL FEED
    0E60 0C 04 1602 1478          394         MVC    LRCAR(5),THGIR         SET PRINT OUT FER RIGHT CARR.
    0E66 C0 87 0CE4               395         B      SNIRP
    0E6A C0 87 0216               396 CLINK   B      LINK
                                  397 ************************************************************************
                                  398 *       CONVERT 1 HEX BYTE TO ZONED DECIMAL SUBROUTINE                 *
                                  399 ************************************************************************
    0E6E 00                  0E6E 400 HXBYT   DC     XL1'00'
    0E6F 36 08 1267               401 CVD     A      CNE,ARR                ADD 1 TO GET 1ST PARAMETER
    0E73 34 08 0E90               402         ST     FROM+5,ARR             INSERT THE FROM ADDR.
    0E77 36 08 1269               403         A      TWC,ARR                ADD 2 GET 2ND PARAMETER
    0E7B 34 08 0E96               404         ST     TYBOT+5,ARR            INSERT THE TO ADDR.
    0E7F 34 08 0E9C               405         ST     CTORZ+5,ARR            INSERT THE TO ADDR.
    0E83 36 08 1267               406         A      CNE,ARR                ADD 1 MORE FER RETURN ADDR.
    0E87 34 08 0E8F               407         ST     TIXE+3,ARR             SET RETURN ADDR.
    0E8B 0C 01 0EA2 0000          408 FROM    MVC    FROBYT+5(2),*-*
    0E91 0C 01 0E85 0000          409 TYBOT   MVC    TCBYT+3(2),*-*
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E97 0C 01 0EA6 0000      410 CTORZ  MVC   ZROTO+3(2),*-*
   0E9D 0C 00 0E6E 0000      411 FROBYT MVC   HXBYT(1),*-*          PUT BYTE IN WORK AREA
   0EA3 04 20 0000 1283      412 ZROTC  ZAZ   *-*(3),DECZRO(1)     ZERO THE TO AREA
   0EA9 0F 00 0E6E 1267      413 DECGAN SLC   HXBYT(1),ONE          DECREMENT THE HEX BYTE
   0EAF F2 82 0A             414        JL    TIXE                 EXIT IF BELOW 1
   0EB2 06 20 C000 1284      415 TOBYT  AZ    *-*(3),DECONE(1)     INCREMENT THE DEC. COUNT
   0EB8 C0 87 0EA9           416        B     DECGAN
   0EBC C0 87 0000           417 TIXE   B     *-*                  RETURN
                             418 ********************************************************************
                             419 *      CHECK  FOR BUSY  AND DELAY SUBROUTINE                       *
                             420 ********************************************************************
   0EC0 34 08 0EE7           421 BROUT  ST    BSEXIT+3,ARR         LOAD RETURN ADDR.
   0EC4 0C 02 162D 1273      422 SDC    MVC   BUSUB(3),BUSCTI      TRY FOR 7.5 SEC TO CLEAR ANY BUSY
   0ECA 0F 02 162D 1267      423 FLOOP  SLC   BUSUB(3),ONE
   0ED0 F2 81 07             424        JZ    TOLONG
   0ED3 C1 E6 0ECA           425        TIO   FLOOP,BUSY
   0ED7 F2 87 0A             426        J     BSEXIT
   0EDA C0 87 0222           427 TOLONG B     HALT                 *ERROR - PRINTER BUSY
   0EDE E011           0EDF  428        DC    XL2'E011'             BUSY ID.
   0EE0 C0 87 0EC4           429        B     SDC                   TRY AGAIN
   0EE4 C0 87 0000           430 BSEXIT B     *-*                     RETURN
                             431 *******                                          *******
                             432 * XIO ************************************************************ XIO *
                             433 *******                                          *******
                             434 *                                                            *
                             435 *   THIS ROUTINE ISSUES AND CHECKS AN EXECUTE I/O COMMAND AS  *
                             436 *   SELECTED BY THE MAINLINE PROGRAM.  LINKAGE TO THIS SUBROUTINE *
                             437 *   IS AS FOLLOWS-                                           *
                             438 *                                                            *
                             439 *       B     XIO                                            *
                             440 *       DC    2,X'Q CODE & CONTROL CODE OF COMMAND'          *
                             441 *                                                            *
                             442 ********************************************************************
   0EE8 0C 01 0F80 1286      443 XIO    MVC   FRMLE+3(2),ADFCLG    PUT IN 112 FORM LENGTH ADDR.
   0EEE 36 C8 1267           444        A     CNE,ARR
   0EF2 34 08 0F0B           445        ST    LDCMD+5,ARR          LOAD PARAMETER POINTER
   0EF6 36 C8 1267           446        A     CNE,ARR
   0EFA 34 08 10D4           447        ST    EXIT+3,ARR           SET UP EXIT
   0EFE 34 01 10D6           448        ST    SAVWUN,XR1           SAVE REG. 1
   0F02 34 02 10D8           449        ST    SAVTUU,XR2           SAVE REG.2
   0F06 0C 01 0FBA 0000      450 LDCMD  MVC   CMND+2(2),*-*        SET UP COMMAND FROM PARAMETER
   0F0C 0C 01 163F 0FBA      451        MVC   MSECS(2),CMND+2        IF ENTRY IS -0XXX-, GO DELAY
   0F12 39 F0 0FB9           452        TBF   CMND+1,X'F0'
   0F16 F2 10 19             453        JT    WT
   0F19 38 40 020A           454        TBN   SBYTE2,SSW11         BRANCH IF SSW11 OFF
   0F1D F2 90 03             455        JF    CSSWOA
   0F20 F0 7C 1B             456        HPL   X'1B',X'7C'          HALT ON E4
   0F23 38 20 020A           457 CSSWOA TBN   SBYTE2,SSW12         DELAY BETWEEN CMDS.
   0F27 F2 90 26             458        JF    TIOCHK
   0F2A 30 00 163F           459        SNS   MSECS,X'0'           READ DATA SWITCHES FOR DELAY
   0F2E 3B F0 163E           460        SBF   MSECS-1,X'F0'        TURN OFF HIGH ORDER 4 BITS OF DELAY
   0F32 0D FF C800 0800      461 WT     CLC   LPI(256),LPI         1 MILLISECOND DELAY
   0F38 0D 3B 0800 0800      462        CLC   LPI(60),LPI
   0F3E 0F 01 163F 1267      463        SLC   MSECS,ONE(2)         DO FOR DESIRED NUM OF MILLISECS
   0F44 C0 84 0F32           464        BH    WT
   0F48 39 F0 0FB9           465        TBF   CMND+1,X'F0'         DO NOT EXECUTE COMMAND IF DELAY
   0F4C C0 10 10C5           466        BT    XIOEXT
   0F50 C1 E0 0F57           467 TIOCHK TIO   ERNRDY,NRDY          BRANCH IF NOT READY
   0F54 F2 87 12             468        J     TIOOK
   0F57 C0 87 10DB           469 ERNRDY B     STERR                BR TO CHECK STATUS
   0F5B C0 87 11A9           470        B     PSTERR               GO PRINT STATUS OR 1ST LINES
   0F5F C0 87 0222           471        B     HALT                 *PRINTER NOT READY
   0F63 E010           0F64  472        DC    XL2'E010'             NOT READY ID.
   0F65 C0 87 0F50           473        B     TIOCHK
   0F69 C0 87 0EC0           474 TIOOK  B     BRGUT                BR TO CHECK STATUS
   0F6D C0 87 10DB           475        B     STERR                GO PRINT STATUS OR 1ST LINES
   0F71 C0 87 11A9           476        B     PSTERR               LOAD LSR ADDRESS REGISTER
   0F75 31 E4 127A           477        LIO   LPIADR,LPIAR
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0F79 31 E6 127C           478        LIO   LPDADR,LPDAR
   0F7D 31 E0 0000           479 FRMLE  LIO   *-*,LOFOLG                LOAD FORMS LENGTH
   0F81 38 80 0209           480        TBN   SBYTE1,SSW08          PRINT ON RIGHT CARR.
   0F85 F2 90 04             481        JF    NOTRIT                JUMP IF NOT
   0F88 3A 08 0FB9           482        SBN   CMND+1,B'1000'        SET MOD.BIT
   0F8C 0C 01 163D 0FBA      483 NOTRIT MVC   ERT1(2),CMND+2
   0F92 38 08 CFB9           484        TBN   CMND+1,B'1000'        THIS CMD.FOR RIGHT CARR.
   0F96 F2 90 11             485        JF    SKRICA                SKIP TO SET LEFT CARR.
   0F99 3C EC 1032           486        MVI   CABY+1,RICABY         SET TO CHECK RIGHT CARR.BUSY
   0F9D 3C E8 1291           487        MVI   SPACEO-1,X'E8'        SET RIGHT CARR.SPACE 0
   0FA1 0C 01 0FD3 128E      488        MVC   LICDSA+5(2),STOAD     PUT RIGHT CARR.CTR.IN COMPARE
   0FA7 F2 87 0E             489        J     CMND
   0FAA 3C E4 1032           490 SKRICA MVI   CABY+1,CABUSY         SET TO CHECK LEFT CARR.BUSY
   0FAE 3C E0 1291           491        MVI   SPACEO-1,X'E0'        SET LEFT CARR.SPACE 0
   0FB2 0C 01 0FD3 1290      492        MVC   LICDSA+5(2),STOP1     PUT LEFT  CARR.CTR.IN COMPARE
   0FB8 F3 00 00             493 CMND   SIO   X'0',X'0'            COMMAND LOADED DURING EXECUTION
   0FBB 0C 01 14A6 1486      494        MVC   MAP(2),CHT17          PUT CHART NO. IN MSG.
   0FC1 0D 01 0FBA 1292      495        CLC   CMND+2(2),SPACEO      DO NOT CHECK FOR BUSY IF THIS WAS
   0FC7 F2 81 35             496        JE    ISBUSY                 SPACE WITH ZERO CONTROL CODE
   0FCA 30 E0 1635           497        SNS   STATO,X'E0'           GRAB THE LINE CTRS.
   0FCE 0D 00 0FBA 0000      498 LICDSA CLC   CMND+2(1),*-*         LINE CTR.SAME AS CMD.C.C.
   0FD4 F2 81 28             499        JE    ISBUSY
   0FD7 C1 E6 0FFF           500        TIO   ISBUSY,BUSY           PRINTER SHOULD BE BUSY
   0FDB 3A 01 1628           501        SBN   TAGS,TAG7             SET 1ST LINE PRINT ONLY
   0FDF 0C 00 11F7 0FFE      502        MVC   HLTID(1),NOBALT       PUT HALT ID IN MSG
   0FE5 C0 87 11A5           503        B     ASTERR                GO PRINT STATUS
   0FE9 C0 87 021A           504        B     PRINT                 PRINT NOT BUSY MSG
   0FED 81                   505 E0ED   DC    XL1'81'
   0FEE 1D                   506 E0EE   DC    IL1'29'
   0FEF 1440                 507 E0F0   DC    AL2(NOBUSY)
   0FF1 C0 87 021A           508        B     PRINT                 PRINT PRINTER MAP CHART NO.
   0FF5 85                   509 E0F5   DC    XL1'85'
   0FF6 0A                   510 E0F6   DC    IL1'10'
   0FF7 14A6                 511 E0F8   DC    AL2(MAP)
   0FF9 C0 87 0222           512        B     HALT                  *IF NOT, HALT ON ERROR
   0FFD E016                 513 E0FE   DC    XL2'E016'              NOT BUSY HALT
   0FFF 3D 02 0A03           514 ISBUSY CLI   RNUM,X'02'             IN ROUTINE 2
   1003 C0 81 10C5           515        BE    XIOEXT
   1007 0C 02 162D 1270      516        MVC   BUSUB(3),BUSCT
   100D 0C 01 1055 1288      517        MVC   DELAY+3(2),ADBUBY     PUT IN LOOP ADDR.
   1013 3C 12 1081           518        MVI   BUALT,X'12'           SET BUFFER BUSY ID
   1017 0C 07 144D 1473      519        MVC   BUMSG(8),BUFF         MOVE BUFFER MSG
   101D C1 E2 104C           520 BUBY   TIO   BSYLP,PBBUSY          PRINT BUFF BUSY
   1021 0C 01 1055 128A      521        MVC   DELAY+3(2),ADCABY     PUT IN LOOP ADDR.
   1027 3C 13 1081           522        MVI   BUALT,X'13'           SET CARR.HALT ID
   1028 0C 07 144D 1463      523        MVC   BUMSG(8),CARR         MOVE CARR.MSG
   1031 C1 00 104C           524 CABY   TIO   BSYLP,*-*             CARRIAGE BUSY
   1035 0C 01 1055 128C      525        MVC   DELAY+3(2),ADPIBY     PUT IN LOOP ADDR.
   103B 3C 14 1081           526        MVI   BUALT,X'14'           SET PRINTER BUSY HALT ID
   103F 0C 07 144D 1468      527        MVC   BUMSG(8),PRIN         MOVE PRINTER BUSY MSG
   1045 C1 E6 104C           528 PIBY   TIO   BSYLP,BUSY            PRINTER BUSY
   1049 F2 87 36             529        J     CHRDY
   104C 0F 02 162D 1267      530 BSYLP  SLC   BUSUB(3),CNE          TRY FOR ABOUT  3  SECONDS TO
   1052 C0 01 0000           531 DELAY  BNZ   *-*                    CLEAR BUSY
   1056 C0 87 10DB           532        B     STERR                 CHECK FOR STATUS ERROR
   105A C0 87 108A           533        B     SDEHF
   105E 3A 01 1628           534        SBN   TAGS,TAG7             SET PRINT 1ST LINES ONLY FLAGS
   1062 0C 00 11F7 1081      535        MVC   HLTID(1),BUALT        PUT HALT ID IN MSG
   1068 C0 87 11A9           536        B     PSTERR                GO PRINT STATUS OR 1ST LINES
   106C C0 87 021A           537        B     PRINT                 PRINT BUSY MSG
   1070 81                   538 1070   DC    XL1'81'
   1071 1B                   539 1071   DC    IL1'27'
   1072 145B                 540 1073   DC    AL2(BUTOLO)
   1074 C0 87 021A           541        B     PRINT                 PRINT PRINTER MAP CHART NO.
   1078 85                   542 1078   DC    XL1'85'
   1079 0A                   543 1079   DC    IL1'10'
   107A 14A6                 544 107B   DC    AL2(MAP)
   107C C0 87 0222           545        B     HALT                  BUSY HALT
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E025   5203 LINE PRINTER FUNCTICN TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    1080 E000             1081  546 BUALT  DC    XL2'E000'
    1082 C1 E0 108D             547 CHRDY  TIO   NRDYER,NRDY
    1086 C0 87 10DB             548        B     STERR               BR TO CHECK ERR STATUS
    108A C0 87 11A9             549 SDEHF  B     PSTERR              GO PRINT STATUS OR 1ST LINES
    108E 3D 0D 0A03             550        CLI   RNUM,X'0D'          IN UNPRTABLE CHAR TEST
    1092 F2 81 30               551        JE    XIOEXT              YES , GET OUT
    1095 38 02 1639             552        TBN   STAT6,B'10'         UNPRTABLE BIT ON
    1099 F2 90 29               553        JF    XIOEXT
    109C C0 87 021A             554        B     PRINT               PRINT UNPRTABLE CHAR SKIPPED
    10A0 C1               10A0  555        DC    XL1'C1'
    10A1 0C               10A1  556        DC    IL1'12'
    10A2 12E5             10A3  557        DC    AL2(DEPP)
    10A4 E00C             10A5  558        DC    XL2'E00C'           UNPRTABLE CHAR HALT
    10A6 0C 01 14A6 14B4        559        MVC   MAP(2),CHT16        PUT CHART NO.IN MSG.
    10AC C0 87 021A             560        B     PRINT               PRINT PRINTER MAP CHART NO.
    10B0 85               10B0  561        DC    XL1'85'
    10B1 0A               10B1  562        DC    IL1'10'
    10B2 14A6             10B3  563        DC    AL2(MAP)
    10B4 C0 87 0222             564        B     HALT                *UNPRINTABLE CHAR SKIPPED BIT ON
    10B8 E00C             10B9  565        DC    XL2'E00C'           UNPRTABLE CHAR HALT
    10BA F2 E7 08               566        J     XIOEXT
    10BD C0 87 10DB             567 NRDYER B     STERR               BR TO CHECK ERR STATUS
    10C1 C0 87 11A9             568        B     PSTERR              GO PRINT STATUS OR 1ST LINES
    10C5 35 01 10D6             569 XIOEXT L     SAVWUN,XR1          RESTORE REG.1
    10C9 35 02 10D8             570        L     SAVTUU,XR2          RESTORE REG.2
    10CD C0 87 0212             571        B     TEST                GO READ DATA SWITCHES
    10D1 C0 87 0000             572 EXIT   B     *-*                 EXIT SUBROUTINE
    10D5 0000             10D6  573 SAVWUN DC    IL2'0'
    10D7 0000             10D8  574 SAVTUU DC    IL2'0'
                                575 *********                                          *********
                                576 * STERR ************************************************** STERR *
                                577 *********                                          *********
                                578 *                                                          *
                                579 *    CHECK FOR STATUS ERROR                                *
                                580 *                                                          *
                                581 ************************************************************
    10D9 0000             10DA  582 STSA1  DC    XL2'0'
    10DB 34 08 11A4             583 STERR  ST    STEXIT+3,ARR        LOAD RETURN ADDRESS
    10DF 30 E3 1639             584        SNS   STAT6,X'E3'         SENSE THE STATUS BYTES
    10E3 3B 02 1628             585        SBF   TAGS,TAG6           SET ERR INDICATOR OFF
    10E7 34 01 10DA             586        ST    STSA1,XR1           SAVE REG. 1
    10EB C2 01 1350             587        LA    STATAB-19,XR1       LOAD TABLE ADDR.
    10EF D2 01 13               588 NOERR  LA    19(,XR1),XR1        ADD 19
    10F2 7D FF 00               589        CLI   0(,XR1),X'FF'       ALL MASKS CHECKED
    10F5 F2 81 9F               590        JE    FOADD
    10F8 1C 00 1103 00          591        MVC   STECK1+1,0(1,XR1)   PUT ERR MASK IN EB2 BYTE
    10FD 1C 00 1107 01          592        MVC   STECK2+1,1(1,XR1)   PUT ERR MASK IN EB1 BYTE
    1102 39 00 1638             593 STECK1 TBF   STAT6-1,*-*         CHECK EB2 BYTE
    1106 39 00 1639             594 STECK2 TBF   STAT6,*-*           CHECK EB1 BYTE
    110A C0 10 10EF             595        BT    NOERR
    110E 1C 00 11F7 02          596        MVC   HLTID(1),2(,XR1)    PUT HALT CODE IN MSG.
    1113 1C 0F 1362 12          597        MVC   IBEP(16),18(,XR1)   PUT NAME IN MSG.
    1118 3A 02 1628             598        SBN   TAGS,TAG6           SET ERR INDICATOR ON
    111C 30 E6 1638             599        SNS   STAIX,X'E6'         GRAB LPDAR
    1120 0D 01 1638 127C        600        CLC   STAIX(2),LPDADR     D.A.R. ADDR. TOO LOW
    1126 F2 82 C9               601        JL    DABOT
    1129 0D 01 1638 1280        602        CLC   STAIX(2),DADEND     D.A.R. ADDR. TOO HIGH
    112F F2 04 09               603        JNH   SABTR
    1132 0C 04 141E 1423        604 DABCT  MVC   HANO(5),INVC        PUT INVALID IN MSG.
    1138 F2 E7 62               605        J     RESTO
    113B 0F 00 1638 1278        606 SABTR  SLC   STAIX(1),ONTUTR     SUBTR.TO GET PRINT POS.
    1141 3D 18 1638             607        CLI   STAIX,X'18'         PRT.POS. 24 OR LESS
    1145 F2 84 27               608        JH    GODEC
    1148 3D 10 1638             609        CLI   STAIX,X'10'         PRT.POS. 16
    114C F2 84 17               610        JH    AD107               GO ADD 107 IF HIGHER
    114F 3D 0D 1638             611        CLI   STAIX,X'0D'         PRT.POS. 13
    1153 F2 02 C7               612        JNL   AD119               GO ADD 119 IF EQUAL OR HIGH
    1156 3D 04 1638             613        CLI   STAIX,X'04'         PRT.POS. 4
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E025   5203 LINE PRINTER FUNCTION TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    115A F2 84 09               614        JH    AD107               GO ADD 107 IF HIGHER
    115D 0E 00 1638 1277        615 AD119  ALC   STAIX(1),UNITIN     ADD 119
    1163 F2 87 0F               616        J     DIVID
    1166 0E 00 1638 1276        617 AD107  ALC   STAIX(1),UNOSVN     ADD 107
    116C F2 87 06               618        J     DIVID
    116F 0F 00 1638 126D        619 GODEC  SLC   STAIX(1),TWYWUN     DECREMENT 21 PRINT POSITIONS
    1175 3C 00 163A             620 DIVID  MVI   STAIX-1,X'00'
    1179 0F 00 1638 126B        621 SUBGAN SLC   STAIX(1),FOUR       DIVIDE
    117F F2 82 0A               622        JL    AWDUN               BY
    1182 0E 00 163A 1267        623        ALC   STAIX-1(1),ONE      FOUR
    1188 C0 87 1179             624        B     SUBGAN
    118C C0 87 0E6F             625 AWDUN  B     CVD                 MAKE HAMMER NO.PRINABLE
    1190 163A             1191  626        DC    AL2(STAIX-1)        FROM
    1192 141E             1193  627        DC    AL2(HANO)           TO
    1194 F2 87 06               628        J     RESTO
    1197 0E 01 11A4 126B        629 FOADD  ALC   STEXIT+3(2),FOUR    ADD TO RETURN ADDR.
    119D 35 01 10DA             630 RESTO  L     STSA1,XR1           RESTORE REG. 1
    11A1 C0 87 0000             631 STEXIT B     *-*                 EXIT
                                632 ***************************************************************
                                633 *    PRINT STATUS ERR AND EXECUTE HALT SUBROUTINE              *
                                634 ***************************************************************
    11A5 30 E3 1639             635 ASTERR SNS   STAT6,X'E3'         GET STATUS
    11A9 34 08 1261             636 PSTERR ST    PREXIT+3,ARR        SET RETURN ADDR.
    11AD 0C 04 1315 147D        637        MVC   NACMD(5),TFEL       PUT LEFT IN MSG.
    11B3 38 08 163C             638        TBN   ERT1-1,B'1000'      WAS CMD.TO RIGHT CARR.
    11B7 F2 90 06               639        JF    SKRIG
    11BA 0C 04 1315 1478        640        MVC   NACMD(5),THGIR      PUT RIGHT IN MSG.
    11C0 C0 87 0E6F             641 SKRIG  B     CVD                 CONVERT CONTROL CODE TO DEC.
    11C4 163D             11C5  642        DC    AL2(ERT1)
    11C6 1302             11C7  643        DC    AL2(CSKPOP)
    11C8 0C 00 12F4 1302        644        MVC   POPSUD(1),DSKPOP    PUT CC INTO SPACE MSG.ALSO
    11CE 0C 10 1327 12F7        645        MVC   LACMND(17),DUSPOP   PUT PRINT&SPACE IN MSG.
    11D4 38 02 163C             646        TBN   ERT1-1,B'10'        THIS A PRINT
    11D8 F2 10 06               647        JT    SEIFSK
    11DB 0C 05 131C 132D        648        MVC   LACMND-11(6),KNALB  BLANK OUT PRINT
    11E1 38 04 163C             649 SEIFSK TBN   ERT1-1,B'100'       THIS A SKIP
    11E5 F2 90 06               650        JF    GOMOST
    11E8 0C 0A 1327 1302        651        MVC   LACMND(11),DSKPOP   PUT SKIP IN MSG<
    11EE C0 87 021A             652 GOMOST B     PRINT               PRINT LAST CMD.ISSUED
    11F2 C1               11F2  653        DC    XL1'C1'
    11F3 25               11F3  654        DC    IL1'37'
    11F4 1327             11F5  655        DC    AL2(LACMND)
    11F6 E000             11F7  656 HLTID  DC    XL2'E000'
    11F8 C0 87 021E             657        B     UNPACK              MAKE STATUS PRINABLE
    11FC 02               11FC  658        DC    IL1'2'
    11FD 1639             11FE  659        DC    AL2(STAT6)          FROM
    11FF 133E             1200  660        DC    AL2(YBATS)          TO
    1201 C0 87 021A             661        B     PRINT               PRINT STATUS BYTES
    1205 81               1205  662        DC    XL1'81'
    1206 11               1206  663        DC    IL1'17'
    1207 133E             1208  664        DC    AL2(YBATS)
    1209 38 01 1628             665        TBN   TAGS,TAG7           1ST LINE ONLY PRINTED
    120D F2 10 4A               666        JT    TESER
    1210 C0 87 021A             667        B     PRINT               PRINT PRICRITY ERR STAT.
    1214 81               1214  668        DC    XL1'81'
    1215 24               1215  669        DC    IL1'36'
    1216 1362             1217  670        DC    AL2(IBEP)
    1218 39 C0 1639             671        TBF   STAT6,B'11000000'   CHAIN SYNC & INCR SYNC OFF
    121C F2 90 1C               672        JF    DOHALT              .
    121F 39 10 1638             673        TBF   STAT6-1,B'10000'    INCR.FAILURE CHK. OFF
    1223 F2 90 15               674        JF    DOHALT
    1226 38 04 1638             675        TBN   STAT6-1,B'100'      HAMMER ECHO CHK.
    122A F2 90 0E               676        JF    DOHALT
    122D C0 87 021A             677        B     PRINT               PRINT HAMMER NO.
    1231 81               1231  678        DC    XL1'81'
    1232 10               1232  679        DC    IL1'16'
    1233 141E             1234  680        DC    AL2(HANO)
    1235 0C 01 141B 132D        681        MVC   HAMNO(2),KNALB      BLANK OUT 'I', 'N' JUST IN CASE
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 123B 0C 01 14A6 1480          682 DOHALT MVC   MAP(2),CHT11        PUT CHART NO. IN MSG.
 1241 C0 87 021A               683        B     PRINT               PRINT PRINTER MAP CHART NO.
 1245 81              1245     684        DC    XL1'81'
 1246 0A              1246     685        DC    IL1'10'
 1247 14A6            1248     686        DC    AL2(MAP)
 1249 C0 87 021A               687        B     PRINT               SPACE 5
 124D 15              124D     688        DC    XL1'15'
 124E 0C 01 1259 11F7          689        MVC   PUIDIN(2),HLTID     PUT ID INTO HALT
 1254 CC 87 0222               690        B     HALT                *STATUS ERROR HALTS
 1258 E000            1259     691 PUIDIN DC    XL2'E000'
 125A 3B 01 1628               692 TESER  SBF   TAGS,TAG7          RESET 1ST LINE ONLY FLAG
 125E CC 87 0000               693 PREXIT B     *-*                 RETURN
                               694
                               695 *********************************************************************
                               696 *      CONSTANTS                                                    *
                               697 *********************************************************************
 1262 0000            1263     698 ZERO   DC    IL2'0'
 1264 0BFF            1265     699 EFFS   DC    XL2'0BFF'
 1266 0001            1267     700 ONE    DC    XL2'0001'
 1268 0002            1269     701 TWO    DC    XL2'0002'
 126A 0004            126B     702 FOUR   DC    IL2'4'
 126C 0015            126D     703 TWYWUN DC    IL2'21'
 126E 018800          1270     704 BUSCT  DC    XL3'018800'
 1271 040000          1273     705 BUSCTI DC    XL3'40000'
 1274 7070            1275     706 FOLG   DC    XL2'7070'           FORM LENGTH 112
 1276 68              1276     707 UNOSVN DC    IL1'107'
 1277 77              1277     708 UNITIN DC    IL1'119'
 1278 7B              1278     709 CNTUTR DC    IL1'123'
 1279 0800            127A     710 LPIADR DC    XL2'800'            IMAGE ADDRESS
 127B 087C            127C     711 LPDADR DC    XL2'87C'            DATA ADDRESS
 127D FFFF            127E     712 SFFE   DC    XL2'FFFF'
 127F 08FF            1280     713 DADEND DC    XL2'8FF'
 1281 1C20            1282     714 UNSEC  DC    IL2'7200'
 1283 F0              1283     715 DECZRO DC    DL1'0'
 1284 F1              1284     716 DECONE DC    DL1'1'
 1285 1275            1286     717 ADFOLG DC    AL2(FOLG)
 1287 101D            1288     718 ADBUBY DC    AL2(BUBY)
 1289 1031            128A     719 ADCABY DC    AL2(CABY)
 128B 1045            128C     720 ADPIBY DC    AL2(PIBY)
 128D 1635            128E     721 STOAD  DC    AL2(STATO)          RIGHT CARR.CTR.ADDR.
 128F 1634            1290     722 STOM1  DC    AL2(STATO-1)        LEFT CARR.CTR.ADDR<
 1291 E000            1292     723 SPACE0 DC    XL2'E000'           SPACE 0
                               724 EXPTAB EQU   *
 1293 0100            1294     725 EXPD0  DC    XL2'0100'           LEFT&RIGHT CARR.LOC.EXPD.
 1295 0C7F            1296     726        DC    XL2'0C7F'                INCRMENT&CHAIN CHAR.CTR.EXP.
 1297 0401            1298     727        DC    XL2'0401'                TIMING EXPD.
 1299 0804            129A     728 EXPD3  DC    XL2'0804'                STATUS EXPD.
 129B FF              129B     729        DC    XL1'FF'
                               730 SENTAB EQU   *
 129C 0000            129D     731 SENS0  DC    XL2'0'              L/R CARR. LINE LOC.
 129E 0000            12A0     732 SENS1  DC    XL2'0'                   INCREM.&CHAIN CHAR.CTR.
 12A0 0000            12A1     733 SENS2  DC    XL2'0'                   TIMING
 12A2 0000            12A3     734 SENS3  DC    XL2'0'                   STATUS
 12A4 C5F0            12A5     735        DC    CL2'E0'
 12A6 C5F1            12A7     736        DC    CL2'E1'
 12A8 C5F2            12A9     737        DC    CL2'E2'
 12AA C5F3            12AB     738        DC    CL2'E3'
                               739
                               740 *********************************************************************
                               741 *      PRINTOUTS                                                    *
                               742 *********************************************************************
 12AC E2C5D5E2C540C3D4 12C3    743 TITLE1 DC    CL24'SENSE CMDS ANALYSIS TEST'
 12B4 C4E240C1D5C1D3E8         743
 12BC E2C9E240E3C5E2E3         743
 12C4 E2C5D5E2C540E3C9 12D9    744 TITL2  DC    CL22'SENSE TIMING BITS TEST'
 12CC D4C9D5C740C2C9E3         744
 12D4 E240E3C5E2E3             744
 12DA 40E4D7C3         12DD    745        DC    CL4' UPC'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 12DE 40E2D2C9D7D7C5C4 12E5    746 DEPP   DC    CL8' SKIPPED'
 12E6 61D7D9C9D5E350   12EC    747        DC    CL7'/PRINT&'
 12ED E2D7C1C3C540     12F2    748        DC    CL6'SPACE '
 12F3 4040             12F4    749 POPSUD DC    CL2'  '
 12F5 404040           12F7    750 DUSPCP DC    CL3'   '
 12F8 E2D2C9D740E3D6   12FE    751        DC    CL7'SKIP TO'
 12FF 40404040         1302    752 DSKPCP DC    CL4'    '
 1303 D3C1E2E340C3D6D4 1310    753        DC    CL14'LAST COMMAND--'
 130B C4C1D5C46060             753
 1311 D3C5C6E340       1315    754 NACMC  DC    CL5'LEFT '
 1316 40D5D6D5C5404040 1327    755 LACMND DC    CL18'  NONE             '
 131E 4040404040404040         755
 1326 4040                     755
 1328 40404C4C4040     132D    756 KNALB  DC    CL6'      '
 132E E2E3C1E3E4E240C2 133A    757        DC    CL13'STATUS BYTES '
 1336 E8E3C5E240               757
 133B 40404040         133E    758 YBATS  DC    CL4'    '
 133F D7D9C9D6D9C9E3E8 1352    759        DC    CL20'PRIORITY ERR BIT IS '
 1347 40C5D9D940C2C9E3         759
 134F 40C9E240                 759
 1353 4040404040404040 1362    760 IBEP   DC    CL16'                '
 135B 4040404040404040         760
                       1363    761 STATAB EQU   *
 1363 008004           1365    762        DC    XL3'008004'         CHAIN SYNC CHK.,HALT 04
 1366 C3C8C1C9D540E2E8 1375    763        DC    CL16'CHAIN SYNC CHK. '
 136E D5C340C3C8D24B40         763
 1376 004005           1378    764        DC    XL3'004005'         INCR SYNC OR SLIP CHK.,HALT 05
 1379 C9D5C3D940E2E8D5 1388    765        DC    CL16'INCR SYNC/SLIP  '
 1381 C361E2C3C9D74040         765
 1389 100006           138B    766        DC    XL3'100006'         INCR FAILURE CHK.,HALT 06
 138C C9D5C3D940C6C1C9 139B    767        DC    CL16'INCR FAILURE CHK'
 1394 D3E4D9C540C3C8D2         767
 139C 040009           139E    768        DC    XL3'040009'         HMR ECHO CHK.,HALT 09
 139F C8C1C4C4C5D940C5 13AE    769        DC    CL16'HAMMER ECHO CHK.'
 13A7 C3C8C640C3C8D24B         769
 13AF 02000A           13B1    770        DC    XL3'02000A'         ANY HMR ON CHK.,HALT 0A
 13B2 C1D5E840C8C1D4D4 13C1    771        DC    CL16'ANY HAMMR CK CHK'
 13BA D940D6D540C3C8D2         771
 13C2 002007           13C4    772        DC    XL3'002007'         HMR.UNIT THERMAL CHK.HALT 07
 13C5 C8D4D94BE3C8C5D9 13D4    773        DC    CL16'HMR.THERMAL CHK.'
 13CD D4C1D340C3C8D24B         773
 13D5 800001           13D7    774        DC    XL3'800001'         CARR.SYNC CHK.,HALT 01
 13D8 C3C1D9D94BE2E8D5 13E7    775        DC    CL16'CARR.SYNC CHK.  '
 13E0 C340C3C8D24B4040         775
 13E8 400002           13EA    776        DC    XL3'400002'         CARR.SPACE CHK.,HALT 02
 13EB C3C1D9D94BE2D7C1 13FA    777        DC    CL16'CARR.SPACE CHK. '
 13F3 C3C54CC3C8D24B40         777
 13FB 200003           13FD    778        DC    XL3'200003'         FORMS JAM CHK.,HALT 03
 13FE C6D6D9D4E240D1C1 140D    779        DC    CL16'FORMS JAM CHK.  '
 1406 D440C3C8D24B4040         779
 140E FF               140E    780        DC    XL1'FF'
 140F C8C1C4C4C5D940D5 141B    781 HAMNC  DC    CL13'HAMMER NO.  '
 1417 D64B404040               781
 141C 404040           141E    782 HANG   DC    CL3'   '
 141F C9D5E5D3C4       1423    783 INVC   DC    CL5'INVLD'
 1424 F5F2F0F340D5D6E3 1431    784        DC    CL14'5203 NOT BUSY '
 142C 40C2E4E2E840             784
 1432 C1C4E3C5D940E2C9 1440    785 NOBUSY DC    CL15'AFTER SIO ACPTD'
 143A D640C1C3D7E3C4           785
 1441 F5F2F0F340       1445    786        DC    CL5'5203 '
 1446 4040404040404040 144D    787 BUMSG  DC    CL8'       '
 144E 40C2E4E2E840E3D6 145E    788 BUTOLO DC    CL14' BUSY TOO LONG'
 1456 D640C3D6D5C7             788
 145C C3C1D5D9C9C1C7C5 1463    789 CARR   DC    CL8'CARRIAGE'
 1464 D7D9C9D5E3C5D940 1468    790 PRIN   DC    CL8'PRINTER '
 146C 40C2E4C6C6C5D940 1473    791 BUFF   DC    CL8' BUFFER '
 1474 D9C9C7C8E3       1478    792 THGIR  DC    CL5'RIGHT'
 1479 D3C5C6E340       147D    793 TFEL   DC    CL5'LEFT '
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   147E D4C1D2C540F5F2F0 1486  794         DC    CL9'MAKE 5203'
   1486 F3                     794
   1487 40D9C5C1C4E8     148C  795         DC    CL6' READY'
   148D 68E3C8C5D540D9C5 149C  796 RESALT  DC    CL16',THEN RESET HALT'
   1495 E2C5E340C8C1D3E3       796
   149D D7E3D948C3C8E34B 14A6  797 MAP     DC    CL10'PTR.CHT.  '
   14A5 4040                   797
   14A7 40C5D5E3D9E840F4 14AE  798 ENT     DC    CL8' ENTRY 4'
   14AF F1F1             14B0  799 CHT11   DC    CL2'11'
   14B1 F1F3             14B2  800 CHT13   DC    CL2'13'
   14B3 F1F6             14B4  801 CHT16   DC    CL2'16'
   14B5 F1F7             14B6  802 CHT17   DC    CL2'17'
   14B7 D1D4D7D940C160C2 14D2  803         DC    CL28'JMPR A-B1E5D10 TO A-B1D2S05,'
   14BF F1C5F5C4F1F040E3       803
   14C7 D64CC160C2F1C4F2       803
   14CF E2F0F56B               803
   14D3 E3C8C5D540D9C5E2 14F5  804         DC    CL35'THEN RESTORE CARRIAGE(S),PRESS CHK '
   14D8 E3D6D9C540C3C1D9       804
   14E3 D9C5C1C7C54DE25D       804
   14EB 6BD7D9C5E2E240C3       804
   14F3 C8D240                 804
   14F6 D9C5E2C5E36B40C1 150A  805 RELORC DC    CL21'RESET, AND RESET HALT'
   14FE D5C440D9C5E2C5E3       805
   1506 40C8C1D3E3             805
   150B C1D3D340         150E  806         DC    CL4'ALL '
   150F E2C5D5E2C540C3D4 151F  807 ALSCF   DC    CL17'SENSE CMDS FAILED'
   1517 C4E240C6C1C9D3C5       807
   151F C4                     807
   1520 6BC2E4E340D6D5D3 152D  808 WCHEB   DC    CL14',BUT ONLY  EBX'
   1528 E8404CC5C2E7           808
   152E 40C2E8E3C5E240C1 153E  809 CNLBYT DC    CL17' BYTES ARE IN ERR'
   1536 D9C540C9D540C5D9       809
   153E D9                     809
   153F E2C5D5E2C540C3D6 1549  810         DC    CL11'SENSE CODE '
   1547 C4C54C                 810
   154A E7E7             154B  811 EDCC    DC    CL2'XX'
   154C 40C9C540C5D9D9   1552  812 SCOIE   DC    CL7' IN ERR'
   1553 40C3D6D4D4C1D5C4 1564  813 LFTCCD DC    CL18' COMMAND   CODE-XX'
   155B 4C4040C3D6C4C560       813
   1563 E7E7                   813
   1565 40404040C3D6C4C5 156F  814 RYTCCD DC    CL11'    CODE-XX'
   156D 60E7E7                 814
   1570 404040C2E8E3C5E2 1588  815         DC    CL25'   BYTES       EB2-EB1    '
   1578 4040404040C5C2         815
   1580 F260C5C2F140404C       815
   1588 40                     815
   1589 C5C2F260C5C2F1   158F  816 BTES    DC    CL7'EB2-EB1'
   1590 404040C5E7D7C5C3 15A0  817 LEXEB2 DC    CL17'   EXPECTED    XX'
   1598 E3C5C440404040E7       817
   15A0 E7                     817
   15A1 40E7E7           15A3  818 LEXEB1 DC    CL3' XX'
   15A4 404040404040E7E7 15AB  819 REXEB2 DC    CL8'      XX'
   15AC 40E7E7           15AE  820 REXEB1 DC    CL3' XX'
   15AF 40404040C1C3E3E4 15C0  821 LACEB2 DC    CL18'    ACTUAL      XX'
   15B7 C1D340404040404040     821
   15BF E7E7                   821
   15C1 40E7E7           15C3  822 LACEB1 DC    CL3' XX'
   15C4 404040404040E7E7 15CB  823 RACEB2 DC    CL8'      XX'
   15CC 40E7E7           15CE  824 RACEB1 DC    CL3' XX'
   15CF E2C5D5E2C540C3D4 15E9  825 OKSEN   DC    CL27'SENSE CMDS OK,REMOVE JUMPER'
   15D7 C4E240D6D26BD9C5       825
   15DF D4D6E5C540D1E4D4       825
   15E7 D7C5D9                 825
   15EA E2C5D5E2C540C3D6 1602  826 LRCAR   DC    CL25'SENSE CODE E2,USING      '
   15F2 C4C540C5F26BE4E2       826
   15FA C9D5C74040404040       826
   1602 40                     826
   1603 40C3C1D9D948     1608  827 SENCO   DC    CL6' CARR.'
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1609 C2C9E34040       160D  828 BADBIT DC    CL5'BIT  '
   160E 40D6C640C5C240   1614  829 CFBYTE DC    CL7' OF EB '
   1615 40C9E240C6C1C9D3 161F  830 FAILED DC    CL11' IS FAILING'
   161D C9D5C7                 830
                         162C  831 TABBIT EQU   *
   1620 F7F6F5F4F3F2F1F0 1627  832         DC    CL8'76543210'
                               833
                               834 ********************************************************************************
                               835 *       RESERVED STORAGE                                                       *
                               836 ********************************************************************************
   1628 00               1628  837 TAGS    DC    XL1'0'              INDICATORS
   1629 00               1629  838 EB1ERC  DC    XL1'0'              EB1 ERRORS
   162A 00               162A  839 EB2ERC  DC    XL1'0'              EB2 ERRORS
   162B 000000           162D  840 BUSUE   DC    XL3'0'
   162E 0000             162F  841 BTSCA   DC    XL2'0'              BITS CN SAVE AREA
   1630 FFFF             1631  842 BTSOFF  DC    XL2'FFFF'           BITS OFF SAVE AREA
   1632 FFFF             1633  843 CMPLNT  DC    XL2'FFFF'
   1634                  1635  844 STAT0   DS    CL2
   1636                  1637  845 STAT2   DS    CL2
   1638                  1639  846 STAT6   DS    CL2
   163A                  163B  847 STAIX   DS    CL2
   163C                  163D  848 ERT1    DS    CL2
   163E                  163F  849 MSECS   DS    CL2                 DELAY TIME AREA
                               850
                               851 ********************************************************************************
                               852 *       EQUATES                                                                *
                               853 ********************************************************************************
                         0008  854 ARR     EQU   X'8'                ADDRESS RECALL REGISTER
                         0001  855 XR1     EQU   X'1'                INDEX REGISTER 1
                         0002  856 XR2     EQU   X'2'                INDEX REGISTER 2
                         0800  857 LPI     EQU   X'800'              LINE PRINTER IMAGE AREA
                         087C  858 LPD     EQU   X'87C'              LINE PRINTER DATA AREA
                         0878  859 LCSFLG  EQU   X'878'
                         00EC  860 LOFCLG  EQU   X'EC'
                         00E4  861 LPIAR   EQU   X'E4'
                         00E6  862 LPDAR   EQU   X'E6'
                         0212  863 TEST    EQU   X'212'              ENTRY TO DCP READ DATA SW'S ROUT.
                         0216  864 LINK    EQU   X'216'              ENTRY TO DCP CHAIN ROUTINE
                         021A  865 PRINT   EQU   X'21A'              ENTRY TO DCP PRINT ROUTINE
                         021E  866 UNPACK  EQU   X'21E'              ENTRY TO DCP UNPACK TO EBCDIC RTN
                         0222  867 HALT    EQU   X'222'              ENTRY TO DCP ERROR HALT ROUTINE
                         00EC  868 NRDY    EQU   X'EC'
                         00E6  869 BUSY    EQU   X'E6'               PRINTER BUSY
                         00E4  870 CABUSY  EQU   X'E4'               LEFT CARR.BUSY
                         00EC  871 RICABY  EQU   X'EC'               RIGHT CARR. BUSY
                         00E2  872 PBBUSY  EQU   X'E2'               BUFFER BUSY
                               873 *   INDICATOR FLAGS.
                         004C  874 TAG1    EQU   X'40'
                         0020  875 TAG2    EQU   X'20'               ONE OR MORE SENSE CMDS CORRECT
                         0010  876 TAG3    EQU   X'10'               SENSE TIMING BIT ERR
                         0008  877 TAG4    EQU   X'08'               MORE THAN 1 SENSE CODE IN ERR
                         0002  878 TAG6    EQU   X'02'
                         0001  879 TAG7    EQU   X'01'
                               880 *   SENSE SWITCH EQUATES.
                         0208  881 SBYTE0  EQU   X'208'              DCP SENSE SWITCH AREA
                         02C9  882 SBYTE1  EQU   X'209'              DCP SENSE SWITCH AREA
                         020A  883 SBYTE2  EQU   X'20A'              SECTION SENSE SWITCH AREA
                               884 *   CONTROL PGM SENSE SWITCHES.
                         0004  885 SSW05   EQU   X'04'               PRINT MESSAGES ON RFCU
                         0080  886 SSW08   EQU   X'80'               USE 5203 RIGHT CARR.
                               887 *   SECTION SENSE SWITCHES.
                         0040  888 SSW11   EQU   X'40'               HALT BETWEEN COMMANDS
                         0020  889 SSW12   EQU   X'20'               DELAY BETWEEN CMDS.
                         0010  890 SSW13   EQU   X'10'               SECONDARY HALT OPTION
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          892
                          893
                          894 *                    COMMENT CARDS
                          895 ********** SECTION E02  **********************************************************
                          896 * ROUT.1 - SENSE CMDS ANALYSIS TEST
                          897 * ROUT.2 - SENSE TIMING BIT TEST
                          898 ************************************************************************************
                          899 * NOTES -
                          900 *  1.SET SSW-05 BEFORE RUNNING THIS TEST.
                          901 *  2.SET SSW-13 IF NO ALTERNATE PRINTER.
                          902 *  3.SET C.E.SWITCH TO OVERRIDE IDLE CONTROL BEFORE RUNNING THIS TEST.
                          903 ************************************************************************************
                          904          TREP
                          905 ********** SECTION E02 **********************************************************
                          906          TREP
                          907 * ROUT.1 - SENSE CMDS ANALYSIS TEST.
                          908          TREP
                          909 * ROUT.2 - SENSE TIMING BIT TEST
                          910          TREP
                          911 ************************************************************************************
                          912          TREP
                          913 * NOTES -
                          914          TREP
                          915 *  1.SET SSW-05 BEFORE RUNNING THIS TEST.
                          916          TREP
                          917 *  2.SET SSW-3,4,13 IF NO ALTERNATE PRINTER.
                          918          TREP
                          919 *  3.SET C.E.SWITCH TO OVERRIDE IDLE CONTROL BEFORE RUNNING THIS TEST.
                          920          TREP
                          921 ************************************************************************************
                FFFF      922          END
```


CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ADBUBY	A	002	1288	0718	C517
ADCABY	A	002	128A	0719	0521
ADFOLG	A	002	1286	0717	0443
ADPIBY	A	002	128C	0720	0525
AD107	A	006	1166	0617	0610 0614
AD119	A	006	115D	0615	C612
ALBAC	A	004	0AAA	0080	0073
ALCOP	A	003	0BF8	0202	0185
ALSCF	A	017	151F	0807	C090
ANBAD	A	004	0AFC	0109	0107
ANEB1	A	004	0D2C	0303	C301*
ANEB2	A	004	0D30	0304	C302*
ANERR	A	004	CAE2	0103	C064
ANYGUD	A	004	0B13	0115	C112
ARR	C	001	0008	0854	0401* 0402 0403* 0404 0405 0406* 0407 0421 0444* 0445 0446* 0447 0583 0636
ASTERR	A	004	11A5	0635	0503
AVID	A	004	0C49	0229	0225
AWDUN	A	004	118C	0625	0622
BADBIT	A	005	160D	0828	0341*
BAPRT	A	004	0CC6	0275	0273
BIBAD	A	005	0DAA	0341	0323
BOTALT	A	002	0E4D	0388	0383* 0384*
BROUT	A	004	0EC0	0421	0474
BSEXIT	A	004	0EE4	043C	C421* 0426
BSYLP	A	006	104C	0530	0520 0524 0528
BTES	A	007	158F	0816	C193
BTSOFF	A	002	1631	C842	C291* 0303* 0304*
BTSON	A	002	162F	0841	0297* 0298* 0313
BUALT	A	002	1081	0546	0518* 0522* 0526* 0535
BUBY	A	004	101D	0520	0718
BUFF	A	008	1473	0791	0519
BUMSG	A	008	144D	0787	0519* 0523* 0527*
BUNALT	A	002	0E30	0381	C376* 0377*
BUSCT	A	003	1270	0704	C516
BUSCTI	A	003	1273	0705	0422
BUSUB	A	003	162D	0840	0422* 0423* 0516* 0530*
BUSY	C	001	0CE6	0869	0425 0500 0528
BUTOLC	A	014	1458	0788	C540
CABUSY	C	001	00E4	0870	0490
CABY	A	004	1031	0524	C486* C490* 0719
CARR	A	008	1463	0785	0523
CHOFF	A	004	0D90	0331	0327
CHRDY	A	004	1082	0547	0529
CHT11	A	002	1480	0799	C682
CHT13	A	002	1482	0800	0204 0358
CHT16	A	002	1484	08C1	0559
CHT17	A	002	1486	08C2	0494
CLINK	A	004	0E6A	0396	0390 0392
CMND	A	003	0FB8	0493	C450* C451 C452 0465 0482* 0483 0484 0489 0495 0498
CMPLNT	A	002	1633	0843	C299* 0300* 0301 0302
COCOD	A	004	0D66	0320	0315* 0329*
CSSWOA	A	004	0F23	0457	0455
CVD	A	004	0E6F	0401	C625 0641
DABOT	A	006	1132	0604	0601
DADENC	A	002	1280	0713	C602
DECGAN	A	006	0EA9	0413	0416
DECONE	A	001	1284	0716	0378 0385 0415
DECZRO	A	001	1283	0715	0412
DELAY	A	004	1052	0531	C517* 0521* 0525*
DEPP	A	008	12E5	0746	0557
DIVID	A	004	1175	0620	C616 0618
DOEB1	A	004	0D56	0316	0330
DOENSE	A	004	0A4A	0053	C047
DOHALT	A	006	123B	0682	0672 0674 0676
DORP	A	006	0E1B	0377	0379

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
DSKPCP	A	004	1302	0752	C643 0644 0651
DUSPOP	A	003	12F7	0750	0645
EB1ERC	A	001	1629	0838	C081 0105* 0240 0248
EB2ERC	A	001	162A	0839	C061* 0066 0084 01C8* 0237 0245
EDOC	A	002	1548	0811	0114* 0224 0229 0235
EFFS	A	002	1265	0699	0291
ENT	A	008	14AE	0798	0208 0362
ERNRDY	A	004	0F57	0469	C467
ERT1	A	002	163D	0848	C019 0345* 0347* 0369 0378* 0385* 0483* 0638 0642 0646 0649
EXIT	A	004	10D1	0572	0447*
EXPDO	A	002	1294	0725	C048*
EXPD3	A	002	129A	0728	C045*
EXPTAB	A	001	1293	0724	0059 0125
FAILED	A	011	161F	0830	0356
FLOOP	A	006	0ECA	0423	C425
FOADD	A	006	1197	0629	0590
FOLG	A	002	1275	0706	0717
FOUR	A	002	1268	0702	0621 0629
FRMLE	A	004	0F7D	0479	0443*
FROBYT	A	006	0E9D	0411	C408*
FROM	A	006	0E88	0408	0402*
GODEC	A	006	116F	0619	0608
GOMOST	A	004	11EE	0652	0650
GORGAN	A	004	0A88	0068	0115
HALT	C	001	0222	0867	0213 0221 0226 0231 0251 0365 0373 0380 0387 0427 0471 0512 0545 0564 0690
HAMNC	A	013	1418	0781	C681*
HANO	A	003	141E	0782	0604* 0627 0680
HLTID	A	002	11F7	0656	0502* 0535* 0596* 0689
HXBYT	A	001	0E6E	0400	0411* 0413*
IBEP	A	016	1362	0760	C597* 0670
IDALT	A	002	0C1A	0214	C086* 0093* 0116* 0217
INVC	A	005	1423	0783	0604
ISBUSY	A	004	OFFF	0514	0496 0499 0500
JALT	A	003	0CD7	0282	0276
JUSUN	A	004	0C39	0224	C220
KNALB	A	006	132D	0756	C648 0681
KORP	A	002	0C9C	0252	0234* 0239* 0242* 0244* 0247* 0250*
LACEB1	A	003	15C3	0822	0163
LACEB2	A	018	15C0	0821	0157
LACMND	A	018	1327	0755	0645* 0648* 0651* 0655
LAC1	A	002	0B96	0162	C159*
LAC2	A	002	0B85	0156	C153*
LDCMD	A	006	0F06	0450	0445*
LEAVIT	A	004	0CAD	0260	0216
LEXEB1	A	003	15A3	0818	0139
LEXEB2	A	017	15A0	0817	0133
LEX1	A	002	0B52	0138	C135*
LEX2	A	002	0B41	0132	C129*
LFTCOD	A	018	1564	0813	C127*
LICDSA	A	006	0FCE	0498	C488* 0492*
LINK	C	001	0216	0E64	0260 0396
LOFOLG	C	001	00E0	0860	0479*
LPD	C	001	087C	0058	0288*
LPDADR	A	002	127C	0711	0478 0600
LPDAF	C	001	00E6	0862	0478*
LPI	C	001	0800	0857	0461 0461 0462 0462
LPIADR	A	002	127A	0710	0477
LPIAF	C	001	00E4	0861	0477*
LRCAR	A	025	1602	0826	0272* 0394*
MAP	A	010	14A6	0797	0204* 0358* C494* 0511 0544 0559* 0563 0682* 0686
MARCS	A	004	0A3B	0046	C044
MSECS	A	002	163F	0849	C292* 0305* 0451* 0459* 0460* 0463*
MUBEUN	A	004	0C7D	0244	0236
MUSBTU	A	006	0AF6	0108	0104
NACMD	A	005	1315	0754	C637* 0640*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
NITNOC	A	006	0D73	0324	C321 0357
NOBALT	A	002	0FFE	0513	0502
NOBET	A	003	0E08	0371	C312* 0336* C346*
NOBUSY	A	015	1440	0785	C507
NOERR	A	003	10EF	0568	C595
NOTRIT	A	006	0F8C	0483	C481
NRDY	C	001	00E0	0868	0273 0467 0547
NRDYER	A	004	108C	0567	0547
OFBYTE	A	007	1614	0829	C314* 0326 0320* 0345
OKSER	A	027	15E9	0825	0212 0257
ONE	A	002	1267	0700	C105 0108 0134 0140 0146 0152 0158 0164 0170 0176 0305 0316 C319 0377 0384 0401 0406 0413 0423 0444 0446 0463 0530 0623
ONLBYT	A	017	153E	0809	C097
ONTUTR	A	001	127E	07C5	C606
OREB1	A	004	0D0C	0297	C295*
OREB2	A	004	0D10	0298	0296*
OTORZ	A	006	0E97	041C	0405*
OUTLOG	A	004	0825	0125	CC92 CC99
PBBUSY	C	001	00E2	0872	0520
PIBY	A	004	1045	0528	C720
POPSUB	A	002	12F4	0745	C288 0644*
PORK	A	004	0C97	0251	C238 0241 0243 0246 0249
PREXIT	A	004	125E	0693	0636*
PRIN	A	008	1468	0790	C527
PRINT	C	001	021A	0865	0033 0038 0087 0094 0117 0181 0186 0190 0194 0198 0205 0209 0254 C277 0283 0348 0353 0359 0363 0504 0508 0537 0541 0554 C560 0652 0661 0667 0677 0683 0687
PROD	A	006	0F38	0384	C386
PR4LI	A	004	08D8	0186	C178 0180
PSTERR	A	004	11A9	0636	C470 0476 0536 0549 0568
PTITL	A	004	0CDA	0283	C274
PUIDIN	A	002	1259	0691	C689*
RACE21	A	003	15CE	C824	0175 0184 0201
RACE82	A	008	15C8	0823	C169
RAC1	A	002	0BB8	0174	C171*
RAC2	A	002	0BA7	0168	C165*
RELORC	A	021	150A	C805	C041
RESALT	A	016	149C	0796	C280
RESTC	A	004	119D	0630	C605 0628
REXEB1	A	003	15AE	C82C	0151 0197
REXEB2	A	008	15A8	0819	C145
REX1	A	002	0B74	0150	C147*
REX2	A	002	0B63	0144	C141*
RICAEY	C	001	00EC	0871	0486
RNUM	A	001	0A03	0016	0514 0550
RTN1	A	001	0A10	0027	C018
RTN2	A	001	0CB1	0267	C029
RYTCOD	A	011	156F	C814	C128* 0189
SABTR	A	006	1138	0606	0603
SAVTUU	A	002	10D8	0574	C449* 0570
SAVWLN	A	002	10D6	0573	0448* 0569
SBYTEC	C	001	0208	0881	C031 C179 0275
SBYTE1	C	001	0209	0882	C480
SBYTE2	C	001	020A	0883	C215 0367 0454 0457
SCARD	A	005	0820	0127	0203
SCOIF	A	007	1552	0812	0120
SDC	A	006	0EC4	0422	0429
SDEHF	A	004	108A	0545	0533
SEBTU	A	004	0E34	0383	0372
SEBUN	A	004	0E17	0376	C370
SEEF	A	004	0B0A	0113	0110
SEGAN	A	004	0CFC	0294	0306
SEIFDF	A	004	0E4E	0389	0334 0368 0375 0382
SEIFSK	A	004	11E1	0649	C647
SENCO	A	006	1608	0827	0351
SENEXT	A	004	0A74	0063	C071

E025 5203 LINE PRINTER FUNCTION TESTS

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SENS0	A	002	129D	0731	C053*
SENS1	A	002	129F	0732	C054*
SENS2	A	002	12A1	0733	C055* 0057*
SENS3	A	002	12A3	0734	0056* 0058*
SENTAB	A	001	129C	0730	0060 0126
SFFE	A	002	127E	0712	0299
SKALT	A	003	0A2D	0042	C032
SKIBIT	A	004	0AD1	0093	0082 0085
SKIHED	A	004	0DD5	0353	0343
SKRICA	A	004	0FAA	0490	C485
SKRIG	A	004	11C0	0641	0639
SNIKP	A	006	0CE4	0288	C395
SNOTIT	A	004	0C59	0234	C230
SPACE0	A	002	1292	0723	C487* 0491* 0495
SPUDT	A	003	0A0C	0020	0046 0385
SPUTA	A	003	0A0F	0021	C177
SSW05	C	001	0004	0885	0031 0179 0275
SSW08	C	001	0080	0886	C480
SSW11	C	001	0040	0888	C454
SSW12	C	001	0020	0889	0457
SSW13	C	001	0010	0890	0215 0367
STAIX	A	002	1638	0847	0599* 0600 0602 0606* 0607 0609 0611 0613 0615* 0617* 0619* 0620* 0621* 0623* 0626
STALT	A	006	0DE1	0358	C332
STATAB	A	001	1363	0761	0587
STAT0	A	002	1635	0844	C497* 0721 0722
STAT2	A	002	1637	0845	0294* 0295 0296 0300
STAT6	A	002	1639	0846	0552 0584* 0593 0594 0635* 0659 0671 0673 0675
STECK1	A	004	1102	0593	0591*
STECK2	A	004	1106	0594	C592*
STERR	A	004	10D8	0583	0469 0475 0532 0548 0567
STEXIT	A	004	11A1	0631	0583* 0629*
STSA1	A	002	10DA	0582	C586* C630
STOAD	A	002	128E	0721	0488
STOM1	A	002	1290	0722	C492
SUBGAN	A	006	1179	0621	C624
SYNARA	A	004	0CA0	0254	0075
TABBIT	A	001	1620	0831	0318
TAGS	A	001	1628	0837	0062* 0065* 0072 0074 0109 0111* 0113* 0219 0310* 0331 0342 0344* 0501* 0534* 0585* 0598* 0665 0692*
TAG1	C	001	0040	0874	0074 0109 0113
TAG2	C	001	0020	0875	0065 0072
TAG3	C	001	0010	0876	0310 0331 0342 0344
TAG4	C	001	0008	0877	0111 0219
TAG6	C	001	0002	0878	0585 0598
TAG7	C	001	0001	0879	0501 0534 0665 0692
TBON	A	003	0D6D	0322	0311* 0317* 0320 0324 0324* 0333 0335* 0346
TENXT	A	004	0D62	0319	0325
TESER	A	004	125A	0692	0666
TEST	C	001	0212	0863	0049 0571
TFEL	A	005	147D	0793	0272 0637
THGIR	A	005	1478	0792	0394 0640
TIOCHK	A	004	0F50	0467	0458 0473
TIOCK	A	004	0F69	0474	0468
TITLE1	A	024	12C3	0743	C036
TITL2	A	022	12D9	0744	0286
TIVA	A	003	0CAA	0259	0218 0223 0228 0233 0253
TIXE	A	004	0EBC	0417	0407* 0414
TOBYT	A	006	0EB2	0415	0409*
TOLONG	A	004	0EDA	0427	0424
TRAM	A	004	0D4E	0314	C337
TWO	A	002	1269	0701	C068 0069 0403
TWYWUN	A	002	126D	0703	0619
TYBOT	A	006	0E91	0409	0404*
UCSFLG	C	001	0878	0859	0043
UNITIN	A	001	1277	0708	0615

E025 5203 LINE PRINTER FUNCTION TESTS

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
UNOSVN	A	001	1276	0707	0617
UNPACK	C	001	021E	0866	0130 0136 0142 0148 0154 0160 0166 0172 0657
UNSEC	A	002	1282	0714	C292
UVWXYZ	A	001	0A00	0005	
WCHEB	A	014	152D	0808	0080* 0083*
WEROM	A	004	0B17	0116	0067 0076
WICAR	A	002	0CEF	0290	C271* 0391 0393*
WT	A	006	0F32	0461	0453 C464
XIO	A	006	0EE8	0443	C289
XIOEXT	A	004	10C5	0569	C466 0515 0551 0553 0566
XR1	C	001	0001	0855	C059* 0063 0068* 0070 0103 0106 0125* 0129 0134* 0135 0140* 0141 0146* 0147 0152* 0202 0313* 0316* 0322 0371 0448 0569* 0586 0587* C588 0588* 0589 0591 0592 0596 0597 0630*
XR2	C	001	0002	0856	C060* 0063 0069* 0103 0106 0114 0126* 0127 0128 0153 0156* 0159 0164* 0165 0170* 0171 0176* 0318* 0319* 0341 0347 0449 0570*
YBATS	A	004	133E	0758	C660 0664
ZALT	A	004	0C15	0213	
ZERO	A	002	1263	0698	C061 0066
ZROTO	A	006	0EA3	0412	C410*

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

THE CHARACTER ° INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

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°GBK°GBD̄°°°PN°25  89952°EC°572250°  PRINTER°FUNCTION  °TEST°°°°°°°°°°  84ø284øø°°°°°°°°  °°°°°°°°E0250000
T+←Y:8BM°°£°°B/°  O|;A°°A£°°F°C.D  8A°HHøZ°KOH*BFUH  QD%|-8%BG°/YAHAM  H̄øG16|¬ø H:|HAACO  °DZY°7.UE0250001
T+←Z5+£DHC|H£BCO  ADZL°/OHK<+°KXLC  /DZø C8/H̄/<+<KY3%  1DD̄#°JH̄TO-DKUøH  BDZO<°JQD̄CW<#ĒAQ  Y$£D°øĒ££E0250002
T+←D̄O°£G2°O*:HAQ  YC£DOF/ITø-F|(-C  KĒLCBDWV'"OC°°£Z  4+B°OF̄<B£BD̄Y8£AQ  YOI°<Y|H̄G$L32EK4  °°AQ°$2ME0250003
T+←,,H̄¬H̄AGC31EK4  °°ACD̄øYCJ|CD<F%B  G°/,8EJF¬8DG2/5£  ø£-OĒCH*BF%H4EL#  -£7H̄G£64°°£GZ-£4  +°AQ°¬L<E0250004
T+←%WH̄JIX$£°°°|H  AA-8°ESYKR3/°EST  2U°*:BAQYøY*I+U°  CH̄BOAEM%IOH*H̄SC1  CCA,°/OFĒO/£NM>A  CO-D°19YE0250005
T+←_/CZ|B°/H̄*.°D  NR°U%°JN?B3£AB4G  °°/OH;°£°°EĒ°€°JI  X(°C.M%BG°/8A°°°  NY3QADW*4°£_IOH*  BG-D°K,UE0250006
T+←>*°°°ND3QADW*  4°£_4OH*BG-D°°AO  >(-CKR3£BB8P°/OF  ;°£°°E*°6°/IX(°H  .V%BG°/8A°°°NO3Q  BDW*°5#0E0250007
T+←?P(°H.ZøBG°/8  A°°°N23CBDW*4°->  80F*BG-D°°AP+(-H  KR3--8-#2DAF8A°H  HøZ°.OH*BFYE#E*#  2/2°°°7JHE0250008
T+←OKOH*BFYD*EO*  °/OHĒ-J4NTøBG°/D  AGAC>OH*BFYH*E*S  °*"OC°°£%_C°DMZ/K  2OH*BFYDKEH#°/OH  Ē/£4°OKME0250009
T+←1(E;X°/OHS8°°  8D°HHøZB.|M<<F?H  A-L-HEST2U°X°/OH  S8H|2/7D°ø/N.ø-D  IOH*BH>BH̄øY)/|¬<  NK"H°:S*EC25001C
T+←2F°£X°/OHS8H3  2/5Dø/°2*|¬°NK"H  AFL4°ES,2-KOø/£2  *|£°OF̄¬H̄AHL2FCI3  2/1Yø/02*|£°OH?H  AC3C°KKHEC250011
T+←3CS°2*|£°CH¬H̄  AAC2ICI3°/CHS8°C  2/0,°/OHĒ£J%N:;°  °øG1POH*BE-H̄°"øø  ø8-3>C°£O°/J*0;°  <17H°4$0EC250012
T+←3=/1£8A°HHøZ°  H̄OH*BFUQ¬EI3-8¬A  ø°øBG°/ZBE/.R8°°  <C-SH̄D?L°/C#Y8-D  <°1Q1DW#<°JQ"DYH  08/Q°*T<E0250013
T+←49(00°C£40(00  °CJDO(TY°ES&:°AQ  >C°CC<11=CODO<1Q  7C°°(.JQ3C°°(<JQ  2+O°C<L%°ET°|°JQ  "CW*°*.HE0250014
T+←540°D<"C%£ES-  ø;°5_|G-+B<HAES4  øø/CM|°£(R3QACW*  ø°£5>O-HCG3QBCW*  *A°5>øYCF;°°°øZ°  7C-°°°=8<E0250015
T+←67CO8($%BBCOH  *øJQMøYC<||CDECO  °CO¬°/O5O+A°CH|H  £KT59CO72-$°ø;£5  _|GU+B<BGCM8%°AQ  (°C-°5Y£E0250016
T+←7D̄DAQYø/°¬+/°  CH°O°ETCDE°O°C-U  ($5O°ET4°OH*BF%D  ¬E-T-J*BG°/D̄AE1Q  ¬OH*(*OOAEĒHQM%%B  G°/Y°4I3E0250017
T+←8V-JHM,%BG°/D  GOH*8H>AE+A°BB?F  £LL72ET32°£*8°°C  2D8$°/OHS8B,2/3*  øGO8OC-°+<AIXAO°  O|JH°$-HEC250018
T+←9-/<°8C/7°/OH  S8°C2/1Y8TC9(C-°  +LJIXAO°O|JHDO°H  ++<BG°S.-°C-A8-3  2UAH*:-3>8YD+|+Y  <#-O°QHUE0250C19
T+←:$AAQBECT°/03  UOH*8E-°6£AIX(°-  +LCCHDWU4B°:O(°-  +XCQHDW*4B°:"C°D  +Y-°°C°D+_£°°C°D  +Z-°°°*88E0250020
```

DATE	31OCT69	28NOV69	02MAR70	11MAY70	01NOV70	19NOV71	15FEB75	PROG ID	E02-5
EC NO.	816529	816542	816631	816671	816764	818677	572250	PAGE	11

OBJECT CARD LISTING

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

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T+←#0°°0°CW8°°°£  -°°°K-Oø°CW8KR"H  BB-Q-°°°K/<BGCD̄X  °/0°°(°-+9COBES4  K*OøBES4KR"H̄AAøG  WC%Y°=/-E0250021
T+←øJøY*H̄OH*BH>°  JOH*+1<8G°°°<°£=  °DYC6BAIX(°-|B3Q  HDW*4BACM(°D£5T£  8D(-<°£=:°°°<°JG  "C8Y°:KOE0250022
T+←°<+¬°|>¬H£FL/°  °°-,2U°|O¬A%8H°H  H̄øZ°W<°°O|3?OET8  (=0-°8°°(+0-°8°°  |°JC"DW¬°/°ø2+¬°  |>*°°°9:8EC250323
T+←=GDACEO;°|N"H̄  GD%BGD(?°/1FZOF*  BH>°£OH*|M<8GC%C  °/1C$OH*JD̄LGUDXY  19/Iø<;°°°CS°°-X  2U°£°°TME0250024
T+←"B+--|>£OAET4  |>T-HC#X2(ADø#A°  2|+-KU£OAC°<KT?H̄  GCT3UDCHø8AH̄JC°D  (41H̄£ø0°°C°DMZ/K  6C£D°°SĒOE0250025
T+←"°C#YKU?H̄A(LC  -ETM(°°=:°°C2-KT  AS-"°+-EOH̄°O°D¬*  |"%BGCĒP°/OHĒ-J4  M£<BG°/DEB/KWOH*  BH>°°°CR4EC250026
T+/°6ET4BB-|°-JC  EC°HC.JIOC°D£NJF̄  H|AH£-£OGED4H*øG  SDDO<°JANDYYøC1B  AC°*MLJJTO£°£L°O  ADEM°°ST8E0250027
T+/A3CYJøEABAC°*  MLJJ.0;O£L|H̄G(-ø  8ES4KRø°A°°C°/1C  $OH*£STYAES-<°AG  7DHG°/1FZOH*BFYD  $EE%°*OME0250028
T+/B>OH*BFYMH̄EH̄$  °/OHS8°CA8AB*CH*  &6øBGDĒU*C&YCøYD  O+°HO+¬H̄£H̄*8G°/,  ACA.V8°O<°JKWE.L°°/OH°?ĒøE0250029
T+/CZFYMH̄EH̄$°/OH  S8°32/0T°/1C$OF*  JDLMAD(C5°/CCOH*  8C%8G°°°°°°°°°°  4BAFU<+<J+L%8ES-  4°J°°:R-E0250C30
T+/DU6%HAD5CK°J(  °*"OC2-Rø*°ACC°AC  °D£*A+£°O+CU°ETX  °DAC?G°°J*OH*C1(  SDTY8ES-09/O#C£D  O+1H°ĒĒHE0250031
T+/E¬¬|H̄B8£4AET%  K-|HDB£ODEA8MF"H̄  GQ-ø°ET%K;C4QET?  2/B**DAQ8øY£P|£4  O+"F8A34DET72/°U  +°AQ°1ROE0250032
T+/FĒ+1I7øY*|C-°  O+1I6øY*FCC°O+1I  _I°°C+-ø°ET%KĒ"H̄  88-8°ETYKRø8GCPX  °/OS?ETYMG?H̄GA-8  ADĒ£°5C*E0250033
T+/GNDW%5°JCĒCH*  °°CCTETU4BAI/C°£  LEJJ'+°-O||H̄£A-O  CD1MM:<BGCWøO|J<  8C°°K*A<BCA°LI1.  7+°H°"T9EC250034
T+/H£ET32D°Q<AJ<  *D248AACøøZ°FC°Y  LI1<8OH*BF%DVD2¬  -°<8G°/88ETUL|%8  G°/ĒADJ<=+°OOH|M  £K%°°J.%EC250035
T+/I./OHĒ-K&LQTX  °ETX2UA09DAQ8øZ°  N+°£O+|H̄£C%BG°/D  ADA£:C°DMF1<_C°D  MZ/KOOH*BFYDH̄EH̄$  °/OH°6O<E0250036
T+/HFF/M<°JIRD¬¬  °/CHS8°°#°JQYOH*  °°°°°6"ø°°£°B°£  °E£FH°°£°GAOE7)  øB°°H¬|="B|ø*H|C  1DXM°8S3E0250037
T+/.ADA4£<JAEETM  Q(+°°°£°<¬C£AB°L  "°°°°°°°°°°CE2<P  11¬.Eø=.E5:.E£<|  M1+I°O|PA4=TS2:I  °8øM°8ĒOE0250038
T+/.ø8>|S1|PS1MC  T2JLI5*;°O%XT8UC  T1;.T&+LPO4CS4%X  P5øPDG|¬R2}PTP+.  PO*|E£DA°£DA°8_.  154°°S$°E0250039
T+/<78"R°£DA°4øG  S84CC5_LMO}PDGFC  L1*$T&OCN5_PE£DA  °£DA°£DA°£DA°£DA  °£DA°&+.TO:|U8UC  8:+<°C/*E025004C
T+/(21:I°£DA°£(¬  R2|$R2:|Y£<PR6PC  82:(°2:I°£DA°£DA  °£DA°£DA°£DA°£°B  °A<|MO*XN&+.Y5*(  °O&-°&2YEC250041
T+/+_4U_°°D°E2}P  C6MCS:(FCC:.L2))  °£A°°A%XNO*V°13G  I4=LR1MCC2£+D°°X  HO}LM1}Y°1*|M5UC  C2(H°°*E0250042
```

DATE	31OCT69	28NOV69	02MAR70	11MAY70	01NOV70	19NOV71	15FEB75	PROG ID	E02-5
EC NO.	816529	816542	816631	816671	816764	818677	572250	PAGE	11A

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/|YKOH B%GN:DC	HO)LM6MCO5MCC2(I	H ¬I5(V.8@TE6)L	A44CC2(I.- AO@G	R6M?S:(PC&<|H4U_	&D $@%E0250043
T+/&T .CO)XRK=.	PO*|E&<|H4U_ H	C1_$R5+I 4*GM&<|	H4U_ &(MHC)LM1)V	5)R.&DA &DA 2)P	V4@& N$4E0250044
T+/J;'¬.0&4CN5>(	O>LS:DCA1>|E&MC	S2)R O*|P8@L5@?C	3&DA &DA &DA &<.	U8>/ 8'$D&(|05*¬	CO)U EH8E0250045
T+/KR6*XA1@PP6*X	N8@PR&CCB9<$F1)V	6*XG2+|L1*$T&(L	A4%N '¬.0@4CR1*G	9:F?T2<PN&(XE8%P	T&<- N3 E0250046
T+/LMO)|T5=|RK@|	H64_ &DCE5;|R:CC	4@¬G1@"G6@¬¬J5(¬	R&<E-07GE**L1@CC	T5UCAQ<.11|.S@|N	,8@- 5/QE0250047
T+/M|1)N 6*PS8'$	R1MCCO)XR2*GG1M7	SPO?P6*PS8UCC2(I	6*PS1;(,&<GN1DC	R1;.E84CHO)|TO)|	L&+H 11@E0250048
T+/NH1)PS1MCC5<L	S&<$A2)|E!F?B9+(	5_PL:DA 1*.X&<.	Y8@PS&<GR1MCI5MC	E6)XS1)PS1MCC5%L	E&+* *1HE0250049
T+/OE94CI5MCE6)V	O*$M5<GN1DA &<|	O1<N-9=) &DA O*$	D1OCX94A &<.Y8@P	S&DA &DA 1*.2Q<P	B@M LTUE025005C
T+/P &DA 1*.2Q<P	B@MA &<PX5@PC8@P	D&DA &+¬X&+¬X&DA	&DA 9=) 9=) &DA	O*|T9\GL&DA &DA	9=* *DYE0250051
T+/P#&+¬X&DA &DA	9=) 9=¬S1)PS1MC	C5<LS&($KE*XE5($	V1MCJ9(LP1)XS1)P	S1MCC5%LE&<P2E=L	S2)M N:4EC250052
T(1Q314A &DA &DC	CO)XRK@.I84A &($	F&<PB&DCI8UCFO*X	L2)PG'"$5*||2&¬	|"""@	;J&E0250053
********** SECTI	CN E02 *********	**********	**********	*******	E0250054
* ROUT.1 - SENSE	CMDS ANALYSIS T	EST.			E0250055
* ROUT.2 - SENSE	TIMING BIT TEST				E0250056
**********	**********	**********	**********	*******	E0250057
* NOTES -					E0250058
* 1.SET SSW-05	BEFORE RUNNING T	HIS TEST.			E0250059
* 2.SET SSW-3,4	,13 IF NO ALTERN	ATE PRINTER.			E0250060
* 3.SET C.E.SWI	TCH TO OVERRIDE	IDLE CONTROL BEF	ORE RUNNING THIS	TEST.	E0250061
**********	**********	**********	**********	******	E0250062
E"'*E7*=¬DC"PH$	="7M&F| | C	F$ ASC R A	SO C	16561208740	21475".YE0250063

LAST PAGE

E033 CHAIN CHARACTER COUNTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                            2        DECK  4
   0A00                     3 E03    START X'A00'
                            4 ********************************************************************
                            5 *                                                                  *
                            6 *      SYSTEM/3 5203 CHAIN CHARACTER COUNTER TEST                  *
                            7 *                                                                  *
                            8 ********************************************************************
                            9 *      SECTION 3 - ROUTINE 1                                       *
                           10 ********************************************************************
   0A00 E033          0A01  11        DC    XL2'E033'          PROGRAM IDENTIFICATION
   0A02 00            0A02  12        DC    XL1'0'             FLAGS
   0A03 01            0A03  13        DC    XL1'1'             CURRENT ROUTINE NUMBER
   0A04 0000          0A05  14        DC    XL2'0'             RESERVED
   0A06 0A0D          0A07  15        DC    AL2(RTN1)          ADDRESS OF FIRST ROUTINE PREFIX
   0A08 0DC4          0A09  16        DC    AL2(ERT1)          ADDRESS OF ERROR RECORDING TABLE
   0A0A EC5000        0A0C  17 SPUDT  DC    XL3'EC5000'        UNIT DEFINITION TABLE - PRINTER
                           18 ********************************************************************
                           19 *                                                                  *
                           20 *      ROUTINE 1 - CHAIN CHARACTER COUNTER TEST                    *
                           21 *                                                                  *
                           22 ********************************************************************
   0A0D 01            0A0F  23 RTN1   DC    XL1'1'             ROUTINE NUMBER
   0A0E 00            0A0E  24        DC    XL1'0'             FLAGS
   0A0F FFFF          0A10  25        DC    XL2'FFFF'          LAST ROUTINE
                           26 ********************************************************************
   0A11 C0 87 0212         27        B     TEST
   0A15 3C 38 0A3C         28        MVI   TECHBI,X'38'       SET TO CHK.48 CHAR.BIT ON
   0A19 0C 02 0D7F 0D79    29        MVC   WHAIN(3),FRATE     PUT 48 IN TITLE
   0A1F 3C 2F 0DCB         30        MVI   HICHCT,X'2F'       SET HIGH CHAR COUNT FOR 48 CHAR
   0A23 3D FF 0878         31        CLI   UCSFLG,X'FF'       UCS FLAG ON
   0A27 F2 01 0E           32        JNE   SENAT
   0A2A 3C 39 0A3C         33        MVI   TECHBI,X'39'       SET TO CHK. 48 CHAR.BIT OFF
   0A2E 3C 77 0DCB         34        MVI   HICHCT,X'77'       SET HIGH CHAR COUNT FOR ECS
   0A32 0C 02 0D7F 0D7C    35        MVC   WHAIN(3),EXCASE    PUT 120 IN TITLE
   0A38 30 E3 0DC2         36 SENAT  SNS   STAT3,X'E3'        GRAB STATUS
   0A3C 38 04 0DC2         37 TECHBI TBN   STAT3,B'100'       48 CHAR. BIT ON OR OFF
   0A40 F2 10 17           38        JT    GOPRT
   0A43 38 04 0208         39        TBN   SBYTE0,SSW05       PRINT ON MFCU
   0A47 F2 90 0A           40        JF    UDALT
   0A4A C0 87 021A         41        B     PRINT              PRINT 'IMAGE AND CHAIN DO NOT AGREE'
   0A4E C1            0A4E  42        DC    XL1'C1'
   0A4F 1C            0A4F  43        DC    IL1'28'
   0A50 0DB4          0A51  44        DC    AL2(ERUDT)
   0A52 EC0E          0A53  45        DC    XL2'E00E'
   0A54 C0 87 0222         46 UDALT  B     HALT               UDT ERR HALT
   0A58 E00E          0A59  47        DC    XL2'E00E'
   0A5A 38 04 0208         48 GOPRT  TBN   SBYTE0,SSW05       PRINT ON MFCU
   0A5E F2 90 0A           49        JF    TIPMU
   0A61 C0 87 021A         50        B     PRINT              PRINT 'XXX CHARACTER CHAIN CHARACTER
   0A65 41            0A65  51        DC    XL1'41'             COUNTER TEST'
   0A66 1C            0A66  52        DC    IL1'28'
   0A67 0D98          0A68  53        DC    AL2(TITL1)
   0A69 E000          0A6A  54        DC    XL2'E000'
   0A6B 38 20 0A0C         55 TIPMU  TBN   SPUDT,B'100000'    100-200 LPM DEVICE
   0A6F F2 90 14           56        JF    JUMPIT
   0A72 3C 0A 0D55         57        MVI   THRTEN,X'CA'
   0A76 3C 0A 0B04         58        MVI   YABIT+1,X'0A'
   0A7A 0C 01 0BD1 0D72    59        MVC   HICNT+5(2),ADMAX
   0A80 0C 01 0C0B 0D70    60        MVC   LOCNT+5(2),ADMIN
                           61 ********************************************************************
                           62 *    TAKE 1550 SAMPLES OF CHAIN EMITTER TIMING                     *
                           63 ********************************************************************
   0A86 3C 00 0DC8         64 JUMPIT MVI   LPCUNT,X'00'       START LOOP COUNT AT 0
   0A8A 0C 01 1FFF 0D6A    65        MVC   ENTUU(2),OFF
   0A90 3C 1F 0DC7         66 LUGAN  MVI   BLAKNT,30          SET WIPE COUNT
   0A94 C2 01 1FFD         67        LA    SEMID,XR1          END OF AREA ADDR.
   0A98 4C 31 00 1FFE      68        MVC   0(50,XR1),ENTUU-1  WIPE 1ST 50
   0A9D 36 01 0D6C         69 MOVMOR A     MIFTY,XR1          DECR.ADDR. BY 50
```


E033 CHAIN CHARACTER COUNTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   0AA1 5C 31 00 32         70        MVC   0(50,XR1),50(,XR1)  WIPE 50 MORE
   0AA5 0F 00 0DC7 0D4F     71        SLC   BLAKNT(1),ONE       1550 BYTES DONE?
   0AAB C0 01 0A9D          72        BNZ   MOVMOR
   0AAF C0 87 0D24          73        B     BROUT
   0AB3 C2 02 19F0          74        LA    TWOIN,XR2          LOAD SAMPLE AREA ADDR.
   0AB7 B0 E2 01            75 TAKSAN SNS   1(,XR2),X'E2'       5 SENSE TIMING BYTES
   0ABA E2 02 01            76        LA    1(,XR2),XR2        3 ADD 1 TO SAMPLE AREA ADDR.
   0ABD BD FF 01            77        CLI   1(,XR2),X'FF'      4 END OF SAMPLE AREA
   0AC0 C0 01 0AB7          78        BNE   TAKSAN             4 IF NOT, LOOP
                            79 *                               16 =24.3  USEC.LOOP
   0AC4 BC C0 00            80        MVI   0(,XR2),X'C0'      ZERO 2ND SENSE BYTE
                           81 ********************************************************************
                           82 *    CHECK FOR NO EMITTER PULSES                                   *
                           83 ********************************************************************
   0AC7 3C B8 0AD6          84        MVI   CHECN,X'B8'
   0ACB C2 02 19F0          85        LA    TWOIN,XR2          LOAD TIMING AREA ADDR.
   0ACF 3C 28 0DC9          86 PAZZ   MVI   NOEM,X'28'         LOAD TRY COUNT OF 40
   0AD3 E2 02 01            87 CHKNE  LA    1(,XR2),XR2        ADD 1 TO ADDR<
   0AD6 B8 20 00            88 CHECN  TBN   0(,XR2),B'100000'  CHAIN EMITTER ON
   0AD9 F2 10 14            89        JT    ANYMIS
   0ADC 0F 00 0DC9 0D4F     90        SLC   NOEM(1),ONE        TRY 40 SAMPLES
   0AE2 C0 01 0AD3          91        BNZ   CHKNE
   0AE6 C0 87 0222          92        B     HALT               HALT NO EMITTER PULSES
   0AEA E051          0AEB  93        DC    XL2'E051'
   0AEC C0 87 0D0E          94        B     GAWAN
   0AF0 3D B9 0AD6          95 ANYMIS CLI   CHECN,X'B9'        TEST FOR BIT OFF BEEN DONE
   0AF4 F2 81 08            96        JE    SIMYNA
   0AF7 3C B9 0AD6          97        MVI   CHECN,X'B9'        CHANGE TO CHECK FOR BIT OFF
   0AFB C0 87 0ACF          98        B     PAZZ
                           99 ********************************************************************
                          100 *    CHECK FOR MISSED EMITTERS                                     *
                          101 ********************************************************************
   0AFF C2 02 19F0         102 SIMYNA LA    TWOIN,XR2          LOAD TIMING AREA ADDR.
   0B03 3C 11 0DC9         103 YABIT  MVI   NCEM,17            LOAD TRY COUNT OF 17 OR 10
   0B07 E2 02 01           104 NOBIT  LA    1(,XR2),XR2        ADD 1 TO ADDR.
   0B0A B8 20 00           105        TBN   0(,XR2),B'100000'  CHAIN EMITTER ON
   0B0D F2 10 18           106        JT    GOODUN
   0B10 0F 00 0DC9 0D4F    107        SLC   NCEM(1),ONE        TRY 17 OR 10 SAMPLES
   0B16 C0 81 0B21         108        BZ    MISEM
   0B1A C2 01 0B07         109        LA    NOBIT,XR1          LOAD LOOP ADDR.
   0B1E F2 87 0E           110        J     CHEND
   0B21 C0 87 0222         111 MISEM  B     HALT               HALT,MISSED AN EMITTER PULSE
   0B25 E052          0B26 112        DC    XL2'E052'
   0B27 C0 87 0D0E         113        B     GAWAN
   0B2B C2 01 0B03         114 GOODUN LA    YABIT,XR1          LOAD LOOP ADDR.
   0B2F 34 02 0DBE         115 CHEND  ST    ADRSAV,XR2
   0B33 0D 01 0DBE 0D64    116        CLC   ADRSAV(2),LASADR   ENTIRE FIELD CHECKED
   0B39 D0 01 00           117        BNE   0(,XR1)
                          118 ********************************************************************
                          119 *    SENSE 1550 SAMPLES OF TIMING AND CHAR.COUNTER                 *
                          120 ********************************************************************
   0B3C 35 02 0D6E         121        L     MODEL,XR2                LOAD 350 MS SEARCH
   0B40 36 02 0D68         122 HMCOP  A     NEG1,XR2           DECREMENT DELAY
   0B44 C0 81 0B81         123        BZ    EMON
   0B48 30 E2 0DC0         124        SNS   STAT2,X'E2'              GRAB TIMING
   0B4C 38 01 0DBF         125        TBN   STAT2-1,B'1'             HOME LATCH ON
   0B50 C0 90 0B40         126        BF    HMCOP
   0B54 3C 96 0DCD         127        MVI   MSECS,150          SET 150 MS DELAY
   0B58 3C 01 0BA0         128        MVI   SHLONG+1,X'01'
   0B5C 38 20 0A0C         129        TBN   SPUDT,B'100000'    100-200 LPM ?
   0B60 F2 10 08           130        JT    NOUCS
   0B63 3C FF 0DCD         131        MVI   MSECS,255
   0B67 3C 07 0BA0         132        MVI   SHLONG+1,X'07'
   0B6B 0D FF 0800 0800    133 NOUCS  CLC   LPI(256),LPI      DELAY 1 MS.
   0B71 0D 3B 0800 0800    134        CLC   LPI(60),LPI
   0B77 0F 00 0DCD 0D4F    135        SLC   MSECS(1),ONE       DECR DELAY COUNT
   0B7D C0 84 0B6B         136        BH    NOUCS
   0B81 C2 02 19F0         137 EMON   LA    TWOIN,XR2          LOAD TIMING AREA ADDR.
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0B85 C2 01 13E0            138        LA    ONEIN,XR1          LOAD CHAR.CTR.AREA ADDR.
   0B89 B0 E2 01              139 SLOOP  SNS   1(,XR2),X'E2'       5-SENSE TIMING BYTES
   0B8C 7C E1 01              140        SNS   1(,XR1),X'E1'       5-SENSE CHAR.CTR.BYTE
   0B8F 5C 00 00 01           141        MVC   0(1,XR1),1(XR1)     6-PUT C.C.INTC LO ADDR.
   0B93 36 01 0D4F            142        A     ONE,XR1             6-ADD TO C.C.ADDR.
   0B97 36 02 C04F            143        A     ONE,XR2             6-ADD TO TIMING ADDR.
   0B9B 34 02 0DBE            144        ST    ADRSAV,XR2          6
   0B9F 0D 01 0DBE 0D64       145 SHLONG CLC   ADRSAV(2),LASADR    22 OR 10-ADDR.REG.TO END
   0BA5 C0 01 CB89            146        BNE   SLOOP              4
                              147 *                                48-CY.  73 USEC.   LOOP
                              148 *                                6C-CY. 91.2 USEC LOOP FOR 100-200
   0BA9 3C 00 1FFE            149        MVI   ENTUU-1,X'C0'       ZERO 2ND SENSE BYTE
                              150 ********************************************************************
                              151 *    CHECK HOME LATCH MISSING                                      *
                              152 ********************************************************************
   0BAD C2 02 19EF            153        LA    TWOIN-1,XR2         LOAD TIMING AREA ADDR.
   0BB1 0C 01 0DC6 0D4D       154        MVC   SAVSAM(2),ZERO
   0BB7 0C 01 0DB6 0D4D       155 ZERSAM MVC   SAMCNT(2),ZERO      ZERO SAMPLE COUNTER
   0BBD E2 02 01              156 ADWUN  LA    1(,XR2),XR2         ADD 1 TO SAMPLE ADDR<
   0BC0 B8 01 00              157        TBN   0(,XR2),B'1'        HOME LATCH ON
   0BC3 F2 10 27              158        JT    GCTWUN              YES JUMP
   0BC6 0E 01 0DB6 0D4F       159        ALC   SAMCNT(2),ONE       ADD 1 TO SAMPLE CNTR.
   0BCC 0D 01 0DB6 0D59       160 HICNT  CLC   SAMCNT(2),FEMAX     SAMPLE COUNTER OVER MAX        S
   0BD2 F2 04 11              161        JNH   LOADUN              JUMP IF NOT
   0BD5 3D FF 0878            162        CLI   UCSFLG,X'FF'        UCS CHAIN
   0BD9 F2 81 0A              163        JE    LOADUN              SKIP HALT IF YES
   0BDC C0 87 0222            164        B     HALT                HALT NO HOME LATCH OR 1 MISSINF
   0BE0 E053          0BE1    165        DC    XL2'E053'
   0BE2 C0 87 0C0E            166        B     GAWAN
   0BE6 C2 01 0BBD            167 LOADUN LA    ADWUN,XR1           LOAD LOOP ADDR
   0BEA F2 87 51              168        J     CEND
                              169 ********************************************************************
                              170 *    CHECK FOR TOO MANY HOME LATCHES                               *
                              171 ********************************************************************
   0BED 0E 01 0DB6 0D4F       172 GOTWUN ALC   SAMCNT(2),ONE       INCREMENT(1) SAMPLE COUNTER
   0BF3 3D FF 0878            173        CLI   UCSFLG,X'FF'
   0BF7 F2 01 0C              174        JNE   LOCNT
   0BFA 0D 01 0DC6 0D4D       175        CLC   SAVSAM(2),ZERO
   0C00 F2 01 15              176        JNE   TOME
   0C03 F2 87 2E              177        J     SAVIT
   0C06 0D 01 0DB6 0D57       178 LOCNT  CLC   SAMCNT(2),FEMIN      SAMPLE COUNTER UNDER MIN
   0C0C F2 02 1C              179        JNL   LOLPAD
   0C0F 0D 01 0DC6 0D4D       180        CLC   SAVSAM(2),ZERO      1ST HOME LATCH SAVE EMPTY
   0C15 F2 81 1C              181        JE    SAVIT
   0C18 0D C1 0DB6 0D51       182 TOME   CLC   SAMCNT(2),TWO       SAMPLE COUNT HIGHER THAN 2
   0C1E C0 C4 08E6            183        BNH   LOADUN
   0C22 C0 87 0222            184        B     HALT                HALT,TOO MANY HOME LATCHES
   0C26 E054          0C27    185        DC    XL2'EC54'
   0C28 F2 87 E3              186        J     GAWAN
   0C2B 0D 01 0DC6 0D4D       187 LOLPAD CLC   SAVSAM(2),ZERO      1ST HOME LATCH SAVE EMPTY
   0C31 F2 01 06              188        JNE   ALRSVD              NO,THEN SKIP IT
   0C34 0C 01 0DC6 0DB6       189 SAVIT  MVC   SAVSAM(2),SAMCNT    SAVE 1ST HOME LATCH COUNT
   0C3A C2 01 0BB7            190 ALRSVD LA    ZERSAM,XR1          LOAD LOOP ADDR.
   0C3E 34 02 0DBE            191 CEND   ST    ADRSAV,XR2
   0C42 0D 01 0DBE 0D66       192        CLC   ADRSAV(2),ALMLAS    ALL SAMPLES CHECKED
   0C48 D0 C1 00              193        BNE   0(,XR1)             LOOP IF NOT
                              194 ********************************************************************
                              195 *    CHECK CHARACTER COUNTER RESET                                 *
                              196 ********************************************************************
   0C4B C2 01 13DF            197        LA    ONEIN-1,XR1
   0C4F 36 01 0DC6            198        A     SAVSAM,XR1
   0C53 C2 02 19EF            199        LA    TWOIN-1,XR2
   0C57 36 02 0DC6            200        A     SAVSAM,XR2
   0C5B 7D 00 03              201        CLI   3(,XR1),X'00'       3RD HOM SAM 00
   0C5E F2 01 08              202        JNE   HOSAM3
   0C61 4D 00 00 0DCB         203        CLC   0(1,XR1),HICHCT     HOMSAM 2F OR 77
   0C66 F2 81 A5              204        JE    GAWAN
   0C69 4D 00 03 0DCB         205 HOSAM3 CLC   3(1,XR1),HICHCT     3RD HOM SAM GREATER THAN 2F OR 77
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0C6E F2 04 2A              206        JNH   ISSEQ
   0C71 7D 7F 03              207        CLI   3(,XR1),X'7F'       IS 3RD HOM SAM 7F
   0C74 F2 01 24              208        JNE   ISSEQ
   0C77 B8 10 03              209        TBN   3(,XR2),B'10000'
   0C7A F2 10 15              210        JT    NOSHFT
   0C7D B8 10 04              211        TBN   4(,XR2),B'10000'
   0C80 F2 10 0F              212        JT    NOSHFT
   0C83 B8 10 05              213        TBN   5(,XR2),B'10000'
   0C86 F2 10 09              214        JT    NOSHFT
   0C89 C0 87 0222            215        B     HALT                NO PSS1 HALT
   0C8D E057          0C8E    216        DC    XL2'E057'
   0C8F F2 87 7C              217        J     GAWAN
   0C92 C0 87 0222            218 NOSHFT B     HALT                NO CC SHIFT HALT
   0C96 E058          0C97    219        DC    XL2'E058'
   0C98 F2 87 73              220        J     GAWAN
   0C9B C2 02 13DB            221 ISSEQ  LA    ONEIN-5,XR2         SET XR2 TO 4 SAMPLES
   0C9F 36 02 0DC6            222        A     SAVSAM,XR2          BEFORE HOMSAM
   0CA3 8E 00 00 0D4F         223        ALC   0(1,XR2),ONE        ADD 1 TO HOMSAM -4
   0CA8 9D 00 00 04           224        CLC   0(1,XR2),4(,XR1)    HOMSAM-4 NOW SAME AS HOMSAM+4
   0CAC F2 01 09              225        JNE   NOSEQ
   0CAF C0 87 0222            226        B     HALT                NO CC RESET HALT
   0CB3 E055          0CB4    227        DC    XL2'EC55'
   0CB5 F2 87 56              228        J     GAWAN
   0CB8 4D 00 03 0DCB         229 NOSEQ  CLC   3(1,XR1),HICHCT     WAS 3RD HOM SAM LESS THAN 2F OR 77
   0CBD F2 04 48              230        JNH   BACTR               THEN ITSA BAD CTR.
   0CC0 3C 0A 0DC9            231        MVI   NOEM,X'0A'          LOAD SKIPPED 1 ERR COUNT
   0CC4 3C 28 0DCA            232        MVI   TRICT,X'28'         LOAD SAMPLE TRY COUNT
   0CC8 36 02 0D53            233        A     FOUR,XR2            SET XR2 TO HOMSAM ADDR.
   0CCC 36 02 0D55            234 PLOOP  A     THRTEN,XR2          SET XR2 TO OR 1C AHEAD OF HOM.SAM.
   0CD0 4E 00 03 0D4F         235        ALC   3(1,XR1),ONE        ADD 1 TO EQUAL NEXT CHAR.COUNT
   0CD5 9D 00 03 03           236        CLC   3(1,XR2),3(,XR1)    ARE THEY EQUAL NOW
   0CD9 F2 81 15              237        JE    GUUDY               JUMP IF YA
   0CDC 4E 00 03 0D4F         238        ALC   3(1,XR1),ONE        ADD 1 MORE
   0CE1 9D 00 03 03           239        CLC   3(1,XR2),3(,XR1)    IS IT ONLY 1 AHEAD
   0CE5 F2 84 20              240        JH    BACTR               IF NOT ITSA BAD COUNTER
   0CE8 0F 00 0DC9 0D4F       241        SLC   NOEM(1),ONE         DECR.SKIPPED 1 ERR COUNT
   0CEE F2 81 17              242        JZ    BACTR               GO TO BAD CTR. IF 10 OF 'EM
   0CF1 36 01 0D55            243 GUUDY  A     THRTEN,XR1
   0CF5 0F 00 0DCA 0D4F       244        SLC   TRICT(1),ONE        LOOKED AT 40 CHAR.COUNTS YET
   0CF8 C0 01 0CCC            245        BNZ   PLOOP               LOOP IF NOT
   0CFF C0 87 0222            246        B     HALT                CC ERROR DUE TO EXTRA
   0D03 E059          0D04    247        DC    XL2'E059'           EMITTER PULSES HALT
   0D05 F2 87 06              248        J     GAWAN
   0D08 C0 87 0222            249 BACTR  B     HALT                BAD CC HALT
   0D0C E056          0D0D    250        DC    XL2'E056'
   0D0E 0E 00 0DC8 0D4F       251 GAWAN  ALC   LPOUNT(1),ONE        ADD TO LOOP COUNT
   0D14 C0 87 0212            252        B     TEST
   0D18 3D 32 0DC8            253        CLI   LPOUNT,X'32'        DONE A 50  LOOPS
   0D1C C0 82 0A90            254        BL    LUGAN               BR TO SAMPLE AGAIN
   0D20 C0 87 0216            255        B     LINK
                              256
                              257 ********************************************************************
                              258 *      CHECK FOR BUSY & DELAY SUBROUTINE                           *
                              259 ********************************************************************
   0D24 34 08 0D4B            260 BROUT  ST    BSEXIT+3,ARR        LOAD RETURN ADDR.
   0D28 0C 02 0DD0 0D5C       261 SDC    MVC   BUSUB(3),BUSCTI     STORE DELAY COUNT
   0D2E 0F C2 0DD0 0D4F       262 FLOOP  SLC   BUSUB(3),ONE
   0D34 F2 81 07              263        JZ    TOLONG
   0D37 C1 E6 0D2E            264        TIO   FLOOP,BUSY
   0D3B F2 87 0A              265        J     BSEXIT
   0D3E C0 87 0222            266 TOLONG B     HALT
   0D42 EC11          0D43    267        DC    XL2'E011'
   0D44 C0 87 0D28            268        B     SDC
   0D48 C0 87 0000            269 BSEXIT B     *-*
                              270 ********************************************************************
                              271 *      CONSTANTS                                                   *
                              272 ********************************************************************
   0D4C 0000          0D4D    273 ZERO   DC    IL2'0'
```

E033 CHAIN CHARACTER COUNTER TEST

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0D4E 0001            0D4F  274 ONE     DC    IL2'1'
    0D50 0002            0D51  275 TWO     DC    IL2'2'
    0D52 0004            0D53  276 FOUR    DC    IL2'4'
    0D54 000D            0D55  277 THRTEN  DC    IL2'13'
    0D56 025F            0D57  278 FEMIN   DC    IL2'607'
    0D58 026D            0D59  279 FEMAX   DC    IL2'621'
    0D5A 040000          0D5C  280 BUSCTI  DC    XL3'040000'
    0D5D 000000000000    0D62  281         DC    XL6'0'          MUST IMMEDIATELY PRECEDE 'LASADR'
    0D63 1FFE            0D64  282 LASADR  DC    AL2(8190)
    0D65 1FFD            0D66  283 ALMLAS  DC    AL2(8189)
    0D67 FFFE            0D68  284 NEG1    DC    XL2'FFFE'
    0D69 00FF            0D6A  285 00F     DC    XL2'00FF'
    0D6B FFCE            0D6C  286 MIFTY   DC    IL2'-50'
    0D6D 3A00            0D6E  287 HODEL   DC    XL2'3A00'
    0D6F 0D74            0D70  288 ADMIN   DC    AL2(FEMINN)
    0D71 0D76            0D72  289 ADMAX   DC    AL2(FEMAXX)
    0D73 01DB            0D74  290 FEMINN  DC    IL2'475'
    0D75 01E4            0D76  291 FEMAXX  DC    IL2'484'
                               292
                               293 ********************************************************************************
                               294 *       PRINTOUTS                                                              *
                               295 ********************************************************************************
    0D77 40F4F8          0D79  296 FRATE   DC    CL3' 48'
    0D7A F1F2F0          0D7C  297 EXCASE  DC    CL3'120'
    0D7D 404040          0D7F  298 WHAIN   DC    CL3'   '
    0D80 40C3C8C1D94BC3C8 0D93 299         DC    CL20' CHAR.CHAIN,CHAR.CTR'
    0D88 C1C9D56BC3C8C1D9
    0D90 4BC3E3D9
    0D94 4BE3C5E2E3      0D98  300 TITL1   DC    CL5'.TEST'
    0D99 C9D4C1C7C540C1D5 0DA8 301         DC    CL16'IMAGE AND CHAIN '
    0DA1 C440C3C8C1C9D540
    0DA9 C4D640D5D6E340C1 0DB4 302 ERUDT   DC    CL12'DC NOT AGREE'
    0UB1 C7D9C5C5
                               303
                               304 ********************************************************************************
                               305 *       RESERVED STORAGE                                                       *
                               306 ********************************************************************************
    0DB5 0000            0DB6  307 SAMCNT  DC    XL2'0'
    0DB7 000000000000    0DBC  308         DC    XL6'0'          MUST IMMEDIATELY PRECEDE 'ADRSAV'
    0DBD                 0DBE  309 ADRSAV  DS    CL2
    0DBF                 0DC0  310 STAT2   DS    CL2
    0DC1                 0DC2  311 STAT3   DS    CL2
    0DC3                 0DC4  312 ERT1    DS    CL2
    0DC5                 0DC6  313 SAVSAM  DS    CL2
    0DC7                 0DC7  314 BLAKNT  DS    CL1
    0DC8                 0DC8  315 LPOINT  DS    CL1
    0DC9                 0DC9  316 NOEM    DS    CL1
    0DCA                 0DCA  317 TRICT   DS    CL1
    0DCB                 0DCB  318 HICHCT  DS    CL1
    0DCC                 0DCD  319 MSECS   DS    CL2
    0DCE                 0DD0  320 BUSUB   DS    CL3
    13E0                       321         ORG   X'13EC'
                         13E0  322 ONEIN   EQU   *               CHAR.COUNTER SAMPLE AREA
    13E0                 19ED  323         DS    31CL50
    19EE                 19EF  324         DS    CL2
                         19F0  325 TWOIN   EQU   *               TIMING EB2 SAMPLE AREA
    19F0                 1FFD  326 SEMID   DS    31CL50
    1FFE                 1FFF  327 ENTUU   DS    CL2
                               328 ********************************************************************************
                               329 *       EQUATES                                                                *
                               330 ********************************************************************************
                    0001 331 XR1     EQU   1                   INDEX REGISTER 1
                    0002 332 XR2     EQU   2                   INDEX REGISTER 2
                    0800 333 LPI     EQU   X'800'              LINE PRINTER IMAGE AREA
                    0878 334 UCSFLG  EQU   X'878'
                    0216 335 LINK    EQU   X'216'              ENTRY TO DCP CHAIN ROUTINE
                    0212 336 TEST    EQU   X'212'              ENTRY TO DCP READ DATA SW'S ROUT.
                    021A 337 PRINT   EQU   X'21A'              ENTRY TO DCP PRINT ROUTINE
```


E033 CHAIN CHARACTER COUNTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                    00E6 338 BUSY    EQU   X'E6'               PRINTER  BUSY CODE
                    0008 339 ARR     EQU   X'8'                ADDR.RECALL REG.
                    0222 340 HALT    EQU   X'222'              ENTRY TO DCP ERROR HALT ROUTINE
                         341 *   SENSE SWITCH EQUATES
                    0208 342 SBYTE0  EQU   X'208'              DCP SENSE SWITCH AREA
                         343 *   CONTROL PGM SENSE SWITCHES
                    0004 344 SSW05   EQU   X'04'               PRINT MESSAGES ON MFCU
                    FFFF 345         END
```

E033 CHAIN CHARACTER COUNTER TEST

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ADMAX	A	002	0D72	0289	0059
ADMIN	A	002	0D70	0288	0060
ADRSAV	A	002	0DBE	0309	0115* 0116 0144* 0145 0191* 0192
ADWUN	A	003	0BBD	0156	0167
ALMLAS	A	002	0D66	0283	0192
ALRSVD	A	004	0C3A	0190	0188
ANYMIS	A	004	0AFC	0095	0089
ARR	C	001	0008	0339	0260
BACTR	A	004	0D08	0249	0230 0240 0242
BLAKNT	A	001	0DC7	0314	0066* 0071*
BROUT	A	004	0D24	0260	0073
BSEXIT	A	004	0D48	0269	0260* 0265
BUSCTI	A	003	0D5C	0280	0261
BUSUB	A	003	0DD0	0320	0261* 0262*
BUSY	C	001	00E6	0338	0264
CEND	A	004	0C3E	0191	0168
CHEND	A	004	0B2F	0115	0110
CHEON	A	003	0AD6	0088	0084* 0095 0097*
CHKNE	A	003	0AD3	0087	0091
EMON	A	004	0B81	0137	0123
ENTUU	A	002	1FFF	0327	0065* 0068 0149*
ERT1	A	002	0DC4	0312	0016
ERUDT	A	012	0DB4	0302	0044
EXCASE	A	003	0D7C	0297	0035
E03	A	001	0A00	0003	
FEMAX	A	002	0D59	0279	0160
FEMAXX	A	002	0D76	0291	0289
FEMIN	A	002	0D57	0278	0178
FEMINN	A	002	0D74	0290	0288
FLOOP	A	006	0D2E	0262	0264
FOUR	A	002	0D53	0276	0233
FRATE	A	003	0D79	0296	0029
GAWAN	A	006	0DCE	0251	0094 0113 0166 0186 0204 0217 0220 0228 0248
GOODUN	A	004	0B2B	0114	0106
GOPRT	A	004	0A5A	0048	0038
GOTWUN	A	006	0BED	0172	0158
GUUDY	A	004	0CF1	0243	0237
HALT	C	001	0222	0340	0046 0092 0111 0164 0184 0215 0218 0226 0246 0249 0266
HICHCT	A	001	0DCB	0318	0030* 0034* 0203 0205 0229
HICNT	A	006	0BCC	0160	0059*
HMOOP	A	004	0B40	0122	0126
HODEL	A	002	0D6E	0287	0121
HOSAM3	A	005	0C69	0205	0202
ISSEQ	A	004	0C9B	0221	0206 0208
JUMPIT	A	004	0AB6	0064	0056
LASADR	A	002	0D64	0282	0116 0145
LINK	C	001	0216	0335	0255
LOADUN	A	004	0BE6	0167	0161 0163 0183
LOCNT	A	006	0C06	0178	0060* 0174
LOLPAD	A	006	0C2B	0187	0179
LPI	C	001	0800	0333	0133 0133 0134 0134
LPOUNT	A	001	0DC8	0315	0064* 0251* 0253
LUGAN	A	004	0A9C	0066	0254
MIFTY	A	002	0D6C	0286	0069
MISEM	A	004	0B21	0111	0108
MOVMOR	A	004	0A9D	0069	0072
MSECS	A	002	0DCD	0319	0127* 0131* 0135*
NEG1	A	002	0D68	0284	0122
NOBIT	A	003	0B07	0104	0109
NOEM	A	001	0DC9	0316	0086* 0090* 0103* 0107* 0231* 0241*
NOSEQ	A	005	0CB8	0229	0225
NOSHFT	A	004	0C92	0218	0210 0212 0214
NOUCS	A	006	0B6B	0133	0130 0136
ONE	A	002	0D4F	0274	0071 0090 0107 0135 0142 0143 0159 0172 0223 0235 0238 0241 0244 0251 0262
ONEIN	A	001	13E0	0322	0138 0197 0221

E033 CHAIN CHARACTER COUNTER TEST

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
OOF	A	002	0D6A	0285	0065
PAZZ	A	004	0ACF	0086	0098
PLOOP	A	004	0CCC	0234	0245
PRINT	C	001	021A	0337	0041 0050
RTN1	A	001	0A0D	0023	0015
SAMCNT	A	002	0DB6	0307	0155* 0159* 0160 0172* 0178 0182 0189
SAVIT	A	006	0C34	0189	0177 0181
SAVSAM	A	002	0DC6	0313	0154* 0175 0180 0187 0189* 0198 0200 0222
SBYTEO	C	001	0208	0342	0039 0048
SDC	A	006	0D28	0261	0268
SEMID	A	050	1FFD	0326	0067
SENAT	A	004	0A38	0036	0032
SHLONG	A	006	0B9F	0145	0128* 0132*
SIMYNA	A	004	0AFF	0102	0096
SLOOP	A	003	0B89	0139	0146
SPUDT	A	003	0ACC	0017	0055 0129
SSW05	C	001	0004	0344	0039 0048
STAT2	A	002	0DC0	0310	0124* 0125
STAT3	A	002	0DC2	0311	0036* 0037
TAKSAN	A	003	0AB7	0075	0078
TECHBI	A	004	0A3C	0037	0028* 0033*
TEST	C	001	0212	0336	0027 0252
THRTEN	A	002	0D55	0277	0057* 0234 0243
TIPMU	A	004	0A6B	0055	0049
TITL1	A	005	0D98	0300	0053
TOLCNG	A	004	0C3E	0266	0263
TOME	A	006	0C18	0182	0176
TRICT	A	001	0DCA	0317	0232* 0244*
TWO	A	002	0D51	0275	0182
TWOIN	A	001	19F0	0325	0074 0085 0102 0137 0153 0199
UCSFLG	C	001	0878	0334	0031 0162 0173
UDALT	A	004	0A54	0046	0040
WHAIN	A	003	0D7F	0298	0029* 0035*
XR1	C	001	0001	0331	0067* 0068 0069* 0070 0070 0109* 0114* 0117 0138* 0140 0141 0141 0142* 0167* 0190* 0193 0197* 0198* 0201 0203 0205 0207 0224 0229 0235 0236 0238 0239 0243*
XR2	C	001	0002	0332	0074* 0075 0076 0076* 0077 0080 0085* 0087 0087* 0088 01C2* 0104 0104* 0105 0115 0121* 0122* 0137* 0139 0143* 0144 0153* 0156 0156* 0157 0191 0199* 0200* 0209 0211 0213 0221* 0222* 0223 0224 0233* 0234* 0236 0239
YABIT	A	004	0B03	0103	0058* 0114
ZERO	A	002	0D40	0273	0154 0155 0175 0180 0187
ZERSAM	A	006	0BB7	0155	0190

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

E033 CHAIN CHARACTER COUNTER TEST

OBJECT CARD LISTING

THE CHARACTER • INDICATES A BLANK COLUMN AND THE CHARACTERS D E H INDICATE NUMERIC SHIFT.

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

T+-Y:8C<  &  B-4  (1+A&  D """ /OH  K|C-H| OBCP@(;LO  ?C*%'"0/8@-D+|CU  H|C17C*%< -5"CPO  0804 ¬Q<E0330001
T+-Z50T-DC*.2DA*  8A HH@Z HOH*BF%D  *C$L-C%BG S.-CT-  D -T2U , /OHE&JO  (W+  +B HC|H&ECO  HCNM 'KHE0330002
T+-DO| Y.A OAB'D  (*-OAC %(*CO C*-  < J""COY@G-7GO-D  ¬"MO1 A"=(-D($EO  1 CH|  7GCM"  &D  )OH* 1L@E0330003
T+-,,CKLB /XO%+H  A8-HA?¬@AO DH_#O   C28B_$B /XO|B-  (2;HB $-- |H&E @   C*U(L@ AB_| /OH  S8ED =Z@E0330004
T+-%WOH*(CT69B_$  2-&-@>&,OOH*H@H  BF¬ @D&7I8-HA>B    @/ $CO (2&5|OHD  .H*HABO¬2/O# /OH  S8EH "8@E0330005
T+-_/OH*(C%HABO<  4 -6=C&D(?-5U4 D   (&H($TQBCOT -&>  A<+H(OC-AC$" U _   |IQ(3LOAB: 8H Y  <@/  R1*E0330006
T+->*BC3"C*4@AO>  -C¬@H  - CL%H  -   CO (3&5|OH&.E@H  BF¬CB J|-%+HA*+D  AP    LQACM@6 -5  |( H 1ROE0330007
T+-?PC$8( &6=COL    &>I|  ¬"%HBF;@  < &7FCM4< &66CM7  S -F8 &C2DB*+ &6  6CM@( &66CNX2AAD  '"O- $HME0330008
T+-OK;|HAB%BG S.  -M@BGC&#B &>'@Y)  JC-D(_-5||¬@H;|H  AC 4AC*Q(L¬HAE¬H  G.-4AC$Q(N"HBG 4  AC*Q 91UE0330009
T+-1(CM72-JO( &6  6CNG A ?WOH*BH>A  M@Y¬TC&D(1-5(@-D  FC D(1-660-D._3&  BC$8( &6=CO$& &C  B J< 1:YE0330010
T+-2H73QAC*$B /X  ?(-H(1X4  "HABD4     7.@YFVL& CC*?  2ABZ'¬O|2 KK8D |  2DAO8D L2D =8D P  2D U @&@E0330011
T+-3COH*BH>AP@Y)  @OH*BH>AQ@Y)3O-H  L63QBC*E+   (L94     L2 &X /OHS8EP  2/5R(  <(2"HDKCO  HC*U 324E0330012
T+-3=|B-(2TQBCN<  6 -5NL- CCM=)  <  C@YDNL- CCM=)  <  C@Y&-CO (2&5|@YD  P(-D(N&@ C*Y(L@   AC<O J8DE0330013
T+-49OH*BH>AR@Y*  FOH*BH>AOC- (2 5  |CH*BDT42C*T --D  &OH*BET&HCM%< -7  &CNO| -7&CM"2-&¬  A9-4 3L8E0330014
T+-54.?HGB%BG S.  -D*BGCKT /O        & B  & C&I¬ W4  D          ¬"/"  '""8 """++- () 5  6 )% LA<E0330015
T+-6? ;J '|T1@?A   &DA O@TA6M?C2<G  I5O?C2<GRK@|T6M?  T1;.T2)LA1@N O)P  D&<|HO*XN&<LO&(P  O84  ::QE0330016
TC 6@O*¬R1*M•••• ••••••••••••••••  ••••••••••••••••  ••••••••••••••••  ••••••••••••••••  •••••*$%E0330017
E""'*E7*=¬DC"PH$  ="7M&F|•••|•••C•  ••F%•••ASC•••R A  SO•••Q••••••••••  •••••20280202710  21971'.HE0330018
```

LAST PAGE

DATE	25AUG69	31OCT69	11MAY70	01NOV70	19FEB71
EC NO.	816485	816529	816671	816764	818912

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           2 *                                                    LAST CHG 19MAY76
                           3         TREP
                           4         DECK  4
                           5         SEQ   0
                           6 *       COM         THIS PREVENTS GENERATION OF OBJECT DECK
  0000                     7 LDS     START X'0'
                           8 ********************************************************************
                           9 *                          BOOTSTRAP - FIRST RECORD                *
                          10 ********************************************************************
                          11 ********************************************************************
                          12 *  LOADER FOR 3741                                                 *
                          13 *  THIS PROGRAM IS CONTAINED IN THE FIRST RECORD ON THE DISKETTE    *
                          14 *  USED TO LOAD THE 3277 MICROCODE.  IT IS READ INTO CORE STARTING  *
                          15 *  AT LOCATION 0000 BY INITIAL PROGRAM LOAD.  THE BOOTSTRAP ROUTINE *
                          16 *  READS THE NEXT TWO RECORDS INTO CORE STARTING AT LOCATION 512 AND *
                          17 *  BRANCHES TO THIS NEXT ROUTINE.                                   *
                          18 *                                                                   *
                          19 ********************************************************************
                    0000  20         USING BOOTS,XR1
                    0000  21         USING BOOTS,XR2
  0000 C2 01 0000         22 BOOTS  LA    0,XR1                 LOAD BASE REGISTER
  0004 C2 02 0100         23        LA    256,XR2               LOAD BASE REGISTER
  0008 F3 43 08           24 BOOT1  SIO   X'08',X'43'           NORMAL RESPONSE TO 3741
  0008 71 41 58           25        LIO   FUNBT1(,XR1),X'41'    LOAD FUNCTION REGISTER
  000E 70 43 56           26 BOOT1A SNS   SNBYT1(,XR1),X'43'    SENSE I/O TRANSFERR LINES
  0011 78 04 55           27        TBN   SNBYT1-1(,XR1),X'04'  TEST FOR ON-LINE BIT ON
  0014 D0 90 4B           28        BF    BOOT1E(,XR1)          GO GIVE AN H5 HALT      N
  0017 78 02 55           29        TBN   SNBYT1-1(,XR1),X'02'  TEST FOR READ BIT ON
  001A D0 90 0E           30        BF    BOOT1A(,XR1)          LOOP UNTIL READ BIT IS ON
  001D F3 43 08           31        SIO   X'08',X'43'           NORMAL RESPONSE TO 3741
  0020 71 44 52           32        LIO   BOOT11(,XR1),X'44'    PUT READ ADDRESS IN DSAR
  0023 71 42 54           33        LIO   LENCT1(,XR1),X'42'    PUT 255-LENGTH IN LC REGISTER
  0026 F3 41 00           34        SIO   0,X'41'               READ THE NEXT RECORD
  0029 D1 42 29           35        TIO   *(,XR1),X'42'         TEST UNTIL 3741 NOT BUSY
  002C F3 43 08           36        SIO   X'08',X'43'           NORMAL RESPONSE TO 3741
  002F 70 42 56           37        SNS   SNBYT1(,XR1),X'42'    GET THE STATUS BYTE
  0032 79 0A 55           38        TBF   SNBYT1-1(,XR1),X'0A'  PARITY READ ERROR OR LCR OVFL CHECK
  0035 D0 90 4B           39        BF    BOOT1E(,XR1)          GO TO THE ERROR HALT
  0038 8C 75 75 0275      40        MVC   117(118,XR2),629      PUT DATA INTO CORE
  003D E2 02 76           41        LA    118(,XR2),XR2         INCREMENT POINTER FOR NEXT RECORD
  0040 5F 00 05 01        42        SLC   BOOTS+5(1,XR1),BOOTS+1(,XR1)  DECREMENT RECORD COUNT
  0044 D0 01 0E           43        BNZ   BOOT1A(,XR1)          CONTINUE WITH A SECOND RECORD
  0047 C0 87 0159         44        B     NEXTC                 GO TO DIAGNOSTIC LOADER
                          45
  004B F0 3B 5D           46 BOOT1E HPL   H5,HH                 3741 NOT READY OR ERROR
  004E D0 87 08           47        B     BOOT1(,XR1)           GO TRY AGAIN
                          48
  0051 0200         0052  49 BOOT11 DC    AL2(512)
  0053 007F         0054  50 LENCT1 DC    XL2'007F'
  0055 0000         0056  51 SNBYT1 DC    XL2'0'
  0057 4000         0058  52 FUNBT1 DC    XL2'4000'
                          53
  0059 40D7D540F5F1F3F2 0075 54        DC    CL29' PN 5132774  EC 571874      X'                REH
  0061 F7F7F44040C5C340
  0069 F5F7F1F8F7F44040
  0071 40404040E7         54
                          54
                          55 *                  ACTUAL VALUES ARE IN ACTUAL CARD.
                          56
  0100                    57        ORG   256
                          58 ********************************************************************
                          59 *                          MICRO CODE LOADER                       *
                          60 ********************************************************************
                          61 ********************************************************************
                          62 *                                                                   *
                          63 *  THIS LOADER IS ENTERED INTO CORE AND BRANCHED TO BY THE PRECEDING *
                          64 *  BOOTSTRAP LOADER.  THIS LOADER LOADS THE ACTUAL MICRO CODE LOADER *
                          65 *  AND BRANCHES TO IT TO BEGIN LOADING THE MICRO CODE.  THE SUBROUTINE*
                          66 *  TO READ RECORDS FROM THE DISKETTE WHICH IS WITHIN THIS LOADER IS  *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          67 *  USED BY THE MICRO CODE LOADER TO READ THE DISKETTE RECORDS.      *
                          68 *                                                                   *
                          69 ********************************************************************
                          70
                          71 *
                          72 ** SUBROUTINE TO READ ONE CARD.
                          73 *
                    00FC  74         USING CDREAD-4,XR2
  0100 C2 02 00FC         75 CDREAD LA    CDREAD-4,XR2          LOAD BASE ADDRESS
  0104 C2 01 0880         76        LA    INPUT,XR1             SET
                    0107  77 AINPUT EQU   *-1
  0108 B4 08 4E           78        ST    CDEXIT+3(,XR2),ARR    SET UP RETURN ADDRESS
  010B B0 43 58           79 DOSIO  SNS   SNBYT2(,XR2),X'43'    SENSE I/O TRANSFERR LINES
  010E B8 04 57           80        TBN   SNBYT2-1(,XR2),X'04'  TEST FOR ON-LINE BIT ON
  0111 E0 90 4F           81        BF    ERR(,XR2)             GO GIVE AN H5 HALT
  0114 B8 02 57           82        TBN   SNBYT2-1(,XR2),X'02'  TEST FOR READ BIT ON
  0117 E0 90 0F           83        BF    DOSIO(,XR2)           LOOP UNTIL READ BIT IS ON
  011A F3 43 08           84        SIO   X'08',X'43'           NORMAL RESPONSE TO 3741
  011D B1 44 0B           85        LIO   AINPUT(,XR2),X'44'    PUT READ ADDRESS IN DSAR
  0120 B1 42 56           86        LIO   LENCT2(,XR2),X'42'    PUT 255-LENGTH IN LC REGISTER
  0123 F3 41 00           87        SIO   0,X'41'               READ THE NEXT RECORD
  0126 E1 42 2A           88        TIO   *(,XR2),X'42'         TEST UNTIL 3741 NOT BUSY
  0129 B0 42 58           89        SNS   SNBYT2(,XR2),X'42'    GET THE STATUS BYTE
  012C B9 0A 57           90        TBF   SNBYT2-1(,XR2),X'0A'  PARITY READ ERROR OR LCR OVFL CHECK
  012F F2 90 19           91        JF    ERR                   GO HALT IF EITHER CONDITION EXISTS
  0132 F3 43 08           92        SIO   X'08',X'43'           NORMAL RESPONSE TO 3741
  0135 B0 43 58           93 EOJCHK SNS   SNBYT2(,XR2),X'43'    SENSE I/O TRANSFERR LINES
  0138 B8 02 57           94        TBN   SNBYT2-1(,XR2),X'02'  CHECK FOR READ BIT ON
  013B F2 10 09           95        JT    CDEXIT                GO ON IF MORE TO BE READ
  013E B8 08 58           96        TBN   SNBYT2(,XR2),X'08'    CHECK FOR END OF JOB
  0141 E0 90 39           97        BF    EOJCHK(,XR2)          KEEP ON CHECKING
  0144 F3 43 08           98        SIO   X'08',X'43'           NORMAL RESPONSE TO 3741
  0147 C0 87 0000         99 CDEXIT B     *-*                   CONTINUE ON PROCESSING
                         100
  014B F0 3B 5D          101 ERR    HPL   H5,HH                 **3741 NOT READY OR ERROR
  014E E0 87 0F          102        B     DOSIO(,XR2)             GO TRY START I/O
                         103
  0151 007F         0152 104 LENCT2 DC    XL2'007F'
  0153 0000         0154 105 SNBYT2 DC    XL2'0'
  0155 0001         0156 106 N1     DC    XL2'0001'
  0157 FFFC         0158 107 NEG4   DC    XL2'FFFC'
                         108
  0159 3C 40 08FF        109 NEXTC  MVI   X'8FF',C' '          CLEAR PRINT FIELD
  015D 0C FE 08FE 08FF   110        MVC   X'8FE'(255),X'8FF'
                         111
  0163 C0 87 0100        112 NEXTR  B     CDREAD                GO READ A CARD
  0167 7D C5 00          113        CLI   0(,XR1),C'E'          IF THIS IS END CARD, GO ON
  016A F2 81 14          114        JE    CKREP                   (LOADER-CHG) CKREP
                         115
  016D 9C 02 7F 03       116        MVC   MOVE+3(3,XR2),03(,XR1) SET UP TO MOVE TEXT DATA TO CORE
  0171 9C 00 80 01       117 LPTONE MVC   MOVE+4(1,XR2),01(,XR1)
  0175 D2 01 04          118        LA    04(,XR1),XR1
  0178 1C 00 0000 00     119 MOVE   MVC   *-*(*-*),*-*(,XR1)   INSTRUCTION TO MOVE TEXT DATA
  017D C0 87 0163        120        B     NEXTR                 CONTINUE LOADING, GET NEXT RECORD
  0181 C0 87 0200        121 CKREP  B     X'200'
                         122 *      ECOM                  BEGIN GENERATING TEXT CARDS
```

```
ERR LOC  OBJECT CODE      ADDR  STMT  SOURCE STATEMENT

                                124 *
 01FC                           125         ORG   X'01FC'
 01FC 0100                 01FD 126 LDADDR DC    AL2(CDREAD)   PICK UP ADDRESS OF READ SUBROUTINE
                                127 *
 0200                           128         ORG   X'0200'
                                129 ********************************************************************************
                                130 *                                                                              *
                                131 *                3340 MICROCODE LOADER                                         *
                                132 *                                                                              *
                                133 ********************************************************************************
                                134 *
 0200 C2 01 1000                135 LOADER  LA    UCODE,XR1                 POINT TO MICROCODE STG AREA
                                136 *
 0204 7C 80 00                  137 CLRSTG  MVI   0(,XR1),X'80'             FLAG ALL
 0207 D2 01 03                  138         LA    3(,XR1),XR1                 UNUSED CONTROL
 020A 34 01 0940                139         ST    WORKN,XR1                     STORAGE AREAS
 020E 38 40 093F                140         TBN   WORKN-1,BIT1                    AS DATA AREAS
 0212 C0 90 0204                141         BF    CLRSTG
                                142 *
                                143 *-----------------------------------------------------------------------------
                                144 *                READ ONE MICROCODE RECORD
                                145 *
 0216 35 01 01FD                146 READER L     LDADDR,XR1                SETUP LINKAGE
 021A 34 01 0225                147         ST    READ1+3,XR1                 TO CARD READ
 021E 34 01 023F                148         ST    READ+3,XR1                    SUBROUTINE
                                149 *
 0222 C0 87 0000                150 READ1   B     *-*                       RD FIRST CARD OF SECTION FAO
                                151 *
 0226 0C 03 0933 08DF           152         MVC   SEQ(4),INPUT+95           INITIALIZE CARD
 022C 3D E7 0880                153         CLI   INPUT,C'X'                  SEQUENCE CHECK AND
 0230 F2 01 0D                  154         JNE   CKCARD                        BRANCH IF 96 COLUMN CARD
                                155 *
 0233 0C 03 0933 08CF           156         MVC   SEQ(4),INPUT+79           INITIALIZE CARD SEQUENCE
 0239 F2 87 04                  157         J     CKCARD                      CHECK FROM 80 COL COMPRESSED CD
                                158 *
 023C C0 87 0000                159 READ    B     *-*                       RD NEXT CARD OF SECTION FAO
                                160 *
 0240 C2 01 0880                161 CKCARD LA     INPUT,XR1                 POINT TO CARD READ IN AREA
                                162 *
 0244 7D E7 00                  163         CLI   0(,XR1),C'X'              BRANCH IF NOT
 0247 F2 01 04                  164         JNE   CKID                        80 COLUMN COMPRESSED FORMAT
                                165 *
 024A 5C 07 5F 4F               166         MVC   95(8,XR1),79(,XR1)          POSITION ID AND SEQ FOR CHECKING
                                167 *
 024E 4D 02 5A 092F             168 CKID    CLC   90(3,XR1),FAOID           BRANCH IF
 0253 F2 01 23                  169         JNE   IDERR                       WRONG SECTION ID
                                170 *
 0256 3A 80 092C                171         SBN   IND,SEQCK                 INITIATE CARD SEQUENCE CHECKING
                                172 *
 025A 4D 03 5F 0933             173         CLC   95(4,XR1),SEQ             BRANCH IF
 025F F2 01 26                  174         JNE   SEQERR                      INCORRECT CARD SEQUENCE
                                175 *
 0262 06 30 0933 0912           176         AZ    SEQ(4),D1(1)              INCREMENT SEQUENCE CHECK NUMBER
                                177 *
 0268 7D E7 00                  178         CLI   0(,XR1),C'X'              BRANCH IF COMPRESSED
 026B C0 81 02C4                179         BE    CKTYPE                      FORMAT MICROCODE OBJECT CARD
                                180 *
 026F 7D D4 00                  181         CLI   0(,XR1),C'M'              BRANCH IF 96 COLUMN
 0272 F2 81 1A                  182         JE    CMPRS                       MICROCODE OBJECT CARD
                                183 *
 0275 C0 87 023C                184         B     READ                      GO TO READ ANOTHER CARD
                                185 *
 0279 F0 6F 03                  186 IDERR   HPL   H1,H0                     *** HALT 01 ***
                                187 *
 027C 38 80 092C                188         TBN   IND,SEQCK                 BRANCH IF SEQUENCE CHECKING
 0280 C0 90 0222                189         BF    READ1                       HAS NOT YET BEEN INITIATED
                                190 *
 0284 C0 87 023C                191         B     READ                      GO TO READ ANOTHER CARD
```



```
ERR LOC  OBJECT CODE      ADDR  STMT  SOURCE STATEMENT

 0288 F0 6F 76                  192 *
                                193 SEQERR HPL   H2,H0                    *** HALT 02 ***
                                194 *
 0288 C0 87 023C                195         B     READ                    GO TO READ ANOTHER CARD
                                196 *
                                197 *-----------------------------------------------------------------------------
                                198 *                COMPRESS ONE MICRO-CODE RECORD
                                199 *
 028F C2 01 08D4                200 CMPRS   LA    RECN,XR1                  POINT TO MICROCODE RECORD
                                201 *
 0293 3C 00 02A7                202         MVI   A1+1,0                    SETUP BYTE COUNT
 0297 0C 00 02AD 02A7           203 CMP01   MVC   A2+1(1),A1+1                  IN ALC INSTRUCTIONS
                                204 *
 029D 7D D0 00                  205         CLI   0(,XR1),X'D0'             CHANGE ANY HEX 'D0'
 02A0 F2 01 03                  206         JNE   A1                          BYTE IN MICROCODE
 02A3 7C 2A 00                  207         MVI   0(,XR1),X'2A'                 RECORD TO HEX '2A'
                                208 *
 02A6 0E 00 08D4 08D4           209 A1      ALC   RECN(*-*),RECN            SHIFT OFF TWO UNUSED BITS
 02AC 0E 00 08D4 08D4           210 A2      ALC   RECN(*-*),RECN              FROM EACH BYTE IN RECORD
                                211 *
 02B2 36 01 0911                212         A     NEG1,XR1                  UPDATE RECORD POINTER
                                213 *
 02B6 0E 00 02A7 0905           214         ALC   A1+1(1),ONE               UPDATE SHIFT BYTE COUNT
                                215 *
 02BC 3D 54 02A7                216         CLI   A1+1,RECN-REC             LOOP UNTIL ALL UNUSED BITS HAVE
 02C0 C0 82 0297                217         BL    CMP01                       BEEN SHIFTED OUT OF RECORD
                                218 *
                                219 *-----------------------------------------------------------------------------
                                220 *                CHECK MICROCODE RECORD TYPE
                                221 *
 02C4 3D C5 0881                222 CKTYPE  CLI   REC+1,C'E'                BRANCH IF
 02C8 C0 81 0305                223         BE    REPFAO                      END RECORD
                                224 *
 02CC 3D E3 0881                225         CLI   REC+1,C'T'                BRANCH IF
 02D0 F2 81 04                  226         JE    TEXT                        TEXT RECORD
                                227 *
 02D3 C0 87 023C                228         B     READ                      GO TO READ NEXT RECORD
                                229 *
                                230 *-----------------------------------------------------------------------------
                                231 *                PROCESS MICRO-CODE TEXT RECORD
                                232 *
 02D7 3D 00 0886                233 TEXT    CLI   REC+6,0                   BRANCH IF NO DATA
 02DB C0 81 023C                234         BE    READ                        BYTES IN TEXT RECORD
                                235 *
 02DF 0C 01 093C 0889           236         MVC   CSAR(2),REC+9             SETUP CONTROL STG ADDRESS
 02E5 C0 87 06F9                237         B     GENADR                    GENERATE POINTER TO STG AREA
                                238 *
 02E9 C2 02 088A                239         LA    REC+10,XR2                POINT TO DATA AREA OF RECORD
                                240 *
 02ED 6C 02 02 02               241 TEXT01  MVC   2(3,XR1),2(,XR2)          STORE MICROWORD
                                242 *
 02F1 D2 01 03                  243         LA    3(,XR1),XR1               ADVANCE
 02F4 E2 02 03                  244         LA    3(,XR2),XR2                 POINTERS
                                245 *
 02F7 0F 00 0886 0909           246         SLC   REC+6,THREE(1)            DECREMENT DATA BYTE COUNT
 02FD C0 01 02ED                247         BNZ   TEXT01                    BRANCH IF NOT YET ZERO
                                248 *
 0301 C0 87 023C                249         B     READ                      GO TO READ NEXT RECORD
                                250 *
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                           252 ***************************************************************************
                           253 *                                                                         *
                           254 *         MODIFY CONTROL STORE IMAGE WITH PATCH AREA DATA                  *
                           255 *                                                                         *
                           256 ***************************************************************************
                           257 *
0305 C2 02 7600            258 REPFA0   LA    PATCH,XR2              POINT TO PATCH AREA
                           259 *
0309 BD FF 00              260 REP01    CLI   0(,XR2),X'FF'          BRANCH IF PATCH
030C F2 81 97              261          JE    REPX                     TERMINATOR BYTE
                           262 *
030F 2C 01 093C 01         263 REP02    MVC   CSAR,1(2,XR2)          SAVE CONTROL STORE ADDRESS
0314 C0 87 06F9            264          B     GENADR                 GENERATE POINTER TO STG AREA
                           265 *
0318 E2 02 02              266          LA    2(,XR2),XR2            ADVANCE PATCH AREA POINTER
                           267 *
031B 2C 02 093A 02         268 REP05    MVC   OPREG,2(3,XR2)         GET CONTROL STORE DATA
                           269 *
0320 38 80 0938            270          TBN   C,BIT0                 BRANCH IF
0324 F2 90 4F              271          JF    REP12                    MICRO-INSTRUCTION PATCH
                           272 *
0327 38 80 093C            273          TBN   CSARD,BIT0             BRANCH IF
032B F2 90 08              274          JF    REP06                    LEFT CONTROL STORE PATCH
                           275 *
032E 1C 00 0939 01         276          MVC   CR,1(1,XR1)            RETAIN LEFT DATA BYTE
0333 F2 87 05              277          J     REP07                  SKIP NEXT INSTRUCTION
                           278 *
0336 1C 00 093A 02         279 REP06    MVC   Y,2(1,XR1)             RETAIN RIGHT DATA BYTE
                           280 *
033B 0C 01 093E 093A       281 REP07    MVC   WORK+1(2),Y            DATA BYTES TO WORK AREA
                           282 *
0341 0E 00 093E 093E       283 REP08    ALC   WORK+1(1),WORK+1       GENERATE
0347 F2 20 06              284          JNOL  REP09                    RIGHT DATA
034A 0E 00 0938 0907       285          ALC   C(1),TWO                  PARITY BIT
0350 C0 01 0341            286 REP09    BNZ   REP08
                           287 *
0354 3B FD 0938            288          SBF   C,X'FD'                RESET UNUSED BITS
                           289 *
0358 0E 00 093D 093D       290 REP10    ALC   WORK(1),WORK           GENERATE
035E F2 20 06              291          JNOL  REP11                    LEFT DATA
0361 0E 00 0938 090D       292          ALC   C(1),EIGHT               PARITY BIT
0367 C0 01 0359            293 REP11    BNZ   REP10
                           294 *
036B 3B F5 0938            295          SBF   C,X'F5'                RESET UNUSED BITS
036F 3A 90 0938            296          SBN   C,X'90'                SET DATA AND PARITY BITS
                           297 *
0373 F2 87 1E              298          J     REP15                  GO TO SAVE CONTROL STORE DATA
                           299 *
0376 0C 02 0940 093A       300 REP12    MVC   WORKN(3),OPREG         CONTROL STORE DATA TO WORK AREA
                           301 *
037C 0E 00 0938 0916       302 REP13    ALC   C(1),X10               GENERATE
0382 0E 02 0940 0940       303 REP14    ALC   WORKN(3),WORKN           MICRO-WORD
0388 C0 A0 037C            304          BOL   REP13                      PARITY BIT
038C C0 01 0382            305          BNZ   REP14
                           306 *
0390 3B E0 0938            307          SBF   C,X'E0'                RESET UNUSED BITS
                           308 *
0394 4C 02 02 093A         309 REP15    MVC   2(3,XR1),OPREG         SAVE PATCHED MICROWORD
                           310 *
0399 D2 01 03              311 REP16    LA    3(,XR1),XR1            ADVANCE
039C E2 02 03              312          LA    3(,XR2),XR2              POINTERS
                           313 *
039F BD FF 00              314          CLI   0(,XR2),X'FF'          LOOP UNTIL
03A2 C0 01 031B            315          BNE   REP05                    TERMINATOR FOUND
                           316 *
03A6 E2 02 01              317 REPX     LA    1(,XR2),XR2            LOOP
03A9 34 02 0940            318          ST    WORKN,XR2                UNTIL
03AD 38 08 093F            319          TBN   WORKN-1,BIT4               END OF
```



```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
03B1 C0 90 0309            320          BF    REPOK                  PATCH AREA
                           321 *
```

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```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                               323 ***********************************************************
                               324 *                                                         *
                               325 *          MICRO-PROCESSOR INITIALIZATION                 *
                               326 *                                                         *
                               327 ***********************************************************
                               328 *
                               329 *            HALT MICROPROCESSOR
                               330 *
    03B5 F3 C4 7E              331 MPHLT    SIO   X'7E',X'C4'          RESET AND DISABLE 3340 INTRPS
                               332 *
    03B8 31 C5 0730            333          LIO   K04,X'C5'            SET K0 AND K4 (HALT IOP)
    03BC 31 C5 0734            334          LIO   K034,X'C5'           SET K3 (CLOCK RESET)
                               335 *
                               336 *----------------------------------------------------------
                               337 *            RESET EXTERNAL REGISTERS
                               338 *
    03C0 C2 01 0917            339          LA    EXTBL,XR1            POINT TO EXT REG ADDR TABLE
                               340 *
    03C4 3C 00 0938            341          MVI   C,0                  CLEAR OP REG
    03C8 3C 00 093A            342          MVI   Y,0                    C AND Y FIELDS
                               343 *
    03CC 3C 00 0939            344 EXTRST   MVI   CR,0                 CLEAR OP REG CR FIELD
    03D0 C0 87 0677            345          B     LOP                  LOAP OP REG
                               346 *
    03D4 31 C5 0740            347          LIO   LEXTZ,X'C5'          R4-R7 --> EXTERNAL ZONE REG
                               348 *
    03D8 1C 01 093A 01         349          MVC   Y,1(2,XR1)           EXT ADDR & DATA --> OP CR & Y
    03DD C0 87 0677            350          B     LOP                  LOAD OP REG
                               351 *
    03E1 31 C5 073E            352          LIO   LEXTAR,X'C5'         R3-R7 --> EXT ADDR REG (EXTAR)
    03E5 31 C5 075A            353          LIO   LALUD,X'C5'          OP REG Y --> A REG --> D REG
    03E9 31 C5 0744            354          LIO   LEXT,X'C5'           D REG --> EXTERNAL REG
                               355 *
    03ED D2 01 02              356          LA    2(,XR1),XR1          ADVANCE EXT ADDR TBL POINTER
                               357 *
    03F0 7D FF 00              358          CLI   0(,XR1),X'FF'        LOOP UNTIL
    03F3 C0 01 03CC            359          BNE   EXTRST                 END OF ADDRESS TABLE
                               360 *
                               361 *----------------------------------------------------------
                               362 *            RESET MODE BUFFER
                               363 *
    03F7 3C 06 0938            364          MVI   C,X'06'              BUILD
    03FB 3C 80 0939            365          MVI   CR,X'80'               'SMODE'
    03FF 3C 80 093A            366          MVI   Y,X'80'                  MICRO-INSTRUCTION
                               367 *
    0403 C0 87 0663            368 MBRST    B     LXOP                 EXECUTE 'SMODE' INSTRUCTION
                               369 *
    0407 0E 00 0939 0908       370          ALC   CR(1),FOU            ADVANCE MODE BUFFER ADDRESS
                               371 *
    040D 38 20 0939            372          TBN   CR,BIT2              LOOP UNTIL ALL MODE BUFFER
    0411 C0 90 0403            373          BF    MBRST                  LOCATIONS HAVE BEEN RESET
                               374 *
                               375 *----------------------------------------------------------
                               376 *            INITIALIZE ADDRESS LOCAL STORE (ALS)
                               377 *
    0415 3C 02 0938            378          MVI   C,X'02'              BUILD 'SABI'
    0419 3C 80 0939            379          MVI   CR,X'80'               MICRO-INSTRUCTION
                               380 *
    041D 3C 00 093A            381 ALSLD    MVI   Y,0                  SET EVEN ALS LOCATIONS TO X'00'
    0421 C0 87 0663            382          B     LXOP                 EXECUTE 'SABI' INSTRUCTION
                               383 *
    0425 3A 20 0939            384          SBN   CR,BIT2              BUILD 'SADI' MICRO-INSTRUCTION
    0429 C0 87 0663            385          B     LXOP                 EXECUTE 'SADI' INSTRUCTION
                               386 *
    042D 3A 01 0939            387          SBN   CR,BIT7              SETUP ODD ALS ADDRESS
                               388 *
    0431 3C BF 093A            389          MVI   Y,X'BF'              SET ODD ALS LOCATIONS TO X'BF'
    0435 C0 87 0663            390          B     LXOP                 EXECUTE 'SADI' INSTRUCTION
```


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```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                               391 *
    0439 3B 20 0939            392          SBF   CR,BIT2              BUILD 'SABI' MICRO-INSTRUCTION
    043D C0 87 0663            393          B     LXOP                 EXECUTE 'SABI' INSTRUCTION
                               394 *
    0441 0E 00 0939 0905       395          ALC   CR(1),ONE            ADVANCE ALS ADDRESS
                               396 *
    0447 38 20 0939            397          TBN   CR,BIT2              LOOP UNTIL ALL ALS LOCATIONS
    044B C0 90 041D            398          BF    ALSLD                  HAVE BEEN INITIALIZED
                               399 *
                               400 *----------------------------------------------------------
                               401 *            INITIALIZE ZONE LOCAL STORAGE (ZLS)
                               402 *
    044F 3C 03 0938            403          MVI   C,X'03'              BUILD
    0453 3C 80 0939            404          MVI   CR,X'80'               'SZI'
    0457 3C 00 093A            405          MVI   Y,X'00'                  MICRO-INSTRUCTION
                               406 *
    045B C0 87 0663            407 ZLSLD    B     LXOP                 EXECUTE 'SZI' INSTRUCTION
                               408 *
    045F 0E 00 0939 0905       409          ALC   CR(1),ONE            ADVANCE ZLS ADDRESS
                               410 *
    0465 38 20 0939            411          TBN   CR,BIT2              LOOP UNTIL ALL ZLS
    0469 C0 90 045B            412          BF    ZLSLD                  LOCATIONS HAVE BEEN RESET
                               413 *
                               414 *----------------------------------------------------------
                               415 *            INITIALIZE INDEX, CSAR, AND ADDRESS COMPARE REGS
                               416 *
    046D 3C 00 0938            417          MVI   C,0                  X'00' --> OP REG C
    0471 3C 00 0939            418          MVI   CR,0                 X'00' --> OPREG CR
    0475 3C BF 093A            419          MVI   Y,X'BF'              INDEX VALUE --> OP REG Y
    0479 C0 87 0677            420          B     LOP                  LOAD OP REGISTER
                               421 *
    047D 31 C5 075A            422          LIO   LALUD,X'C5'          Y REG --> A REG --> D REG
    0481 31 C5 0752            423          LIO   LINDEX,X'C5'         D REG --> INDEX REG
                               424 *
    0485 3C 00 093A            425          MVI   Y,0                  X'00' --> OP REG Y
    0489 C0 87 0677            426          B     LOP                  LOAD OP REGISTER
                               427 *
    048D 31 C5 075A            428          LIO   LALUD,X'C5'          Y REG --> A REG --> D REG
    0491 31 C5 0748            429          LIO   LCSADR,X'C5'         X'0000' --> CSAR & ADDR COMPARE
                               430 *
    0495 31 C5 0730            431          LIO   K04,X'C5'            RESET K2
    0499 31 C5 072C            432          LIO   RSPCR,X'C5'          RESET PCR LATCH AND X REG
                               433 *
                               434 *----------------------------------------------------------
                               435 *            CHECK FOR SUCCESSFULL INITIALIZATION
                               436 *
    049D 31 C7 072E            437          LIO   SIDLE,X'C7'          SENSE IDLE STATUS
    04A1 30 C7 0940            438          SNS   WORKN,X'C7'
                               439 *
    04A5 3D F7 0940            440          CLI   WORKN,X'F7'          GO TO ERROR HALT IF
    04A9 C0 01 04EB            441          BNE   IOPERR                 INCORRECT IDLE SENSE
                               442 *
    04AD 31 C5 0732            443          LIO   KC24,X'C5'           SET K2 (SERVICE MODE)
    04B1 31 C5 0750            444          LIO   SVACC,X'C5'          SERVICE ACCESS CYCLE
    04B5 31 C5 0734            445          LIO   K034,X'C5'           SET K3 (CLOCK RESET)
    04B9 31 C7 0736            446          LIO   SPTR,X'C7'           SENSE ACCESS POINTER REG
    04BD 30 C7 0940            447          SNS   WORKN,X'C7'
                               448 *
    04C1 3D A1 0940            449          CLI   WORKN,X'A1'          GO TO ERROR HALT IF
    04C5 C0 01 04EB            450          BNE   IOPERR                 INCORRECT ACCESS POINTER
                               451 *
    04C9 31 C7 0742            452          LIO   SALSB,X'C7'          SENSE ALSB
    04CD 30 C7 093E            453          SNS   WORKN-2,X'C7'
    04D1 31 C7 0738            454          LIO   SINDEX,X'C7'         SENSE ALSD & INDEX REG
    04D5 30 C7 0940            455          SNS   WORKN,X'C7'
                               456 *
    04D9 0D 01 093F 0903       457          CLC   WORKN-1(2),NULLS     GO TO ERROR HALT IF
    04DF C0 01 04EB            458          BNE   IOPERR                 INCORRECT MIAR VALUE
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          459 *
 04E3 3D BF 0940          460          CLI   WORKN,X'BF'          GO TO LOAD CONTROL STORE IF
 04E7 C0 81 04F2          461          BE    LDCS                   SUCCESSFULL INITIALIZATION
                          462 *
 04EB F0 6F 1B            463 IOPERR   HPL   H4,H0                 *** HALT 04 ***
                          464 *
 04EE C0 87 03B5          465          B     MPHLT                  GO TO RETRY
                          466 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          468 ********************************************************************
                          469 *                                                                  *
                          470 *              LOAD CONTROL STORAGE WITH ATTACHMENT MICROCODE       *
                          471 *                                                                  *
                          472 ********************************************************************
                          473 *
 04F2 0C 01 093C 0903     474 LDCS     MVC   CSAR(2),NULLS        INITIALIZE CONTROL STORE ADDR
                          475 *
 04F8 C0 87 05F4          476 LDCS01   B     LCSAR                LOAD CONTROL STORE ADDR REG
                          477 *
 04FC 7B 60 00            478          SBF   0(,XR1),X'60'        RESET UNUSED BITS
                          479 *
 04FF 78 80 00            480          TBN   0(,XR1),BITC         BRANCH IF NOT
 0502 F2 90 2E            481          JF    LDCS02                 CONTROL STORE DATA AREA
                          482 *
 0505 0C 02 093A 0903     483          MVC   OPREG(3),NULLS       MOVE ZEROS PATTERN TO OP REG
                          484 *
 050B C0 87 061C          485          B     WRCS                 WRITE ZEROS TO
 050F C0 87 0630          486          B     RDCS                   CONTROL STORE AND READ BACK
                          487 *
 0513 0D 02 093A 0936     488          CLC   OPREG(3),IOPIN+2     BRANCH IF
 0519 F2 01 82            489          JNE   LDCS05                 CONTROL STORE ERROR
                          490 *
 051C 0C 02 093A 0915     491          MVC   OPREG(3),X3FFF       MOVE ONES PATTERN TO OP REG
                          492 *
 0522 C0 87 061C          493          B     WRCS                 WRITE ONES TO
 0526 C0 87 0630          494          B     RDCS                   CONTROL STORE AND READ BACK
                          495 *
 052A 0D 02 093A 0936     496          CLC   OPREG(3),IOPIN+2     BRANCH IF
 0530 F2 01 6B            497          JNE   LDCS05                 CONTROL STORE ERROR
                          498 *
 0533 1C 02 093A 02       499 LDCS02   MVC   OPREG(3),2(,XR1)      GET MICROWORD FROM STG AREA
 0538 3B E0 0938          500          SBF   C,X'E0'              RESET UNUSED BITS
                          501 *
 053C C0 87 061C          502          B     WRCS                 WRITE MICROWORD TO
 0540 C0 87 0630          503          B     RDCS                   CONTROL STORE AND READ BACK
                          504 *
 0544 0D 02 093A 0936     505          CLC   OPREG(3),IOPIN+2     BYPASS ERROR CORRECTION
 054A F2 81 11            506          JE    LDCS03                 IF NO CONTROL STORE ERROR
                          507 *
 054D 78 80 00            508          TBN   0(,XR1),BITO         BRANCH IF ERROR
 0550 F2 10 4B            509          JT    LDCS05                 IN DATA AREA
                          510 *
 0553 7A 20 00            511          SBN   0(,XR1),BIT2
 0556 3A 20 0938          512          SBN   C,BIT2               SET INVERT BIT AND
 055A C0 87 061C          513          B     WRCS                   RE-WRITE CONTROL STORE
                          514 *
 055E 0E 00 093C 0905     515 LDCS03   ALC   CSARD(1),ONE          ADVANCE CONTROL STORE ADDR
                          516 *
 0564 38 80 093C          517          TBN   CSARD,BITO           LOOP UNTIL ENTIRE
 0568 C0 90 04F8          518          BF    LDCS01                 BLOCK HAS BEEN LOADED
                          519 *
 056C 3B 80 093C          520          SBF   CSARD,BITO           ADVANCE CONTROL STG
 0570 0E 00 093B 0905     521          ALC   CSARB(1),ONE           ADDRESS TO NEXT BLOCK
                          522 *
 0576 38 20 093B          523          TBN   CSARB,BIT2           LOOP UNTIL ALL
 057A C0 90 04F8          524          BF    LDCS01                 BLOCKS HAVE BEEN LOADED
                          525 *
 057E 0C 01 093C 0903     526          MVC   CSAR(2),NULLS        INITIALIZE CONTROL STORE ADDR
                          527 *
 0584 C0 87 05F4          528 LDCS04   B     LCSAR                LOAD CONTROL STORE ADDR REG
                          529 *
 0588 1C 02 093A 02       530          MVC   OPREG(3),2(,XR1)     GET MICROWORD FROM STG AREA
 058D 3B C0 0938          531          SBF   C,X'C0'              IGNORE UNUSED BITS
                          532 *
 0591 C0 87 0630          533          B     RDCS                 READ CONTROL STORE
                          534 *
 0595 0D 02 093A 0936     535          CLC   OPREG(3),IOPIN+2     BRANCH IF NO
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  059B F2 81 07                  JE    LDCS06                  CONTROL STORE ERROR
                                *
  059E F0 6F 57                LDCS05  HPL   H3,H0             *** HALT 03 ***
                                *
  05A1 C0 87 04F2                      B     LDCS              GO TO RETRY
                                *
  05A5 0E 00 093C 0905         LDCS06  ALC   CSARD(1),ONE      ADVANCE CONTROL STORE ADDR
                                *
  05AB 38 80 093C                      TBN   CSARD,BIT0        LOOP UNTIL ENTIRE
  05AF C0 90 0584                      BF    LDCS04              BLOCK HAS BEEN TESTED
                                *
  05B3 38 80 093C                      SBF   CSARD,BIT0        ADVANCE CONTROL STG
  05B7 0E 00 093B 0905                 ALC   CSARB(1),ONE        ADDRESS TO NEXT BLOCK
                                *
  05BD 38 20 093B                      TBN   CSARB,BIT2        LOOP UNTIL ALL
  05C1 C0 90 0584                      BF    LDCS04              BLOCKS HAVE BEEN TESTED
                                *
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                                *****************************************************************
                                *                                                               *
                                *              START MICROPROGRAM EXECUTION                     *
                                *                                                               *
                                *****************************************************************
                                *
  05C5 31 C5 074C              GO      LIO   INACC,X'C5'         INITIAL ACCESS CYCLE
  05C9 31 C5 072E                      LIO   RNMODE,X'C5'        RESET K REG (RUN MODE)
  05CD 31 C5 074A                      LIO   RUNIOP,X'C5'        START MICRO-PROCESSOR
                                *
  05D1 0C 01 0940 0905                 MVC   WORKN(2),ONE        INITIALIZE TIMER COUNT
                                *
  05D7 0E 01 0940 0905         GOLP    ALC   WORKN(2),ONE        LOOP UNTIL
  05DD C0 A0 04E8                      BOL   IOPERR                MICRO-PROCESSOR
  05E1 30 C5 0935                      SNS   IOPIN+1,X'C5'           STARTS OR TIMER
  05E5 38 01 0935                      TBN   IOPIN+1,BIT7              COUNT OVERFLOWS
  05E9 C0 10 05D7                      BT    GOLP
                                *
  05ED F0 7C 7C                ENDHLT  HPL   HE,HE             ***      HALT EE          ***
  05F0 C0 87 05ED                      B     ENDHLT            *** SUCCESSFULL COMPLETION ***
                                *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          576 ********************************************************************
                          577 *                                                                  *
                          578 *          SVP INTERFACE CONTROL SUBROUTINES                       *
                          579 *                                                                  *
                          580 ********************************************************************
                          581 *
                          582 *              LOAD CONTROL STORAGE ADDRESS REGISTER (CSAR)
                          583 *
                          584 *
 05F4 34 08 061B          585 LCSAR    ST     LCSARX+3,ARR            SAVE RETURN ADDRESS
                          586 *
 05F8 3C 00 0938          587          MVI    C,0                     X'00' --> OP REG C FIELD
 05FC 0C 00 0939 093B     588          MVC    CR(1),CSARB             CSAR(B) VALUE --> OP REG CR FLD
 0602 0C 00 093A 093C     589          MVC    Y(1),CSARD              CSAR(D) VALUE --> OP REG Y FLD
                          590 *
 0608 C0 87 0677          591          B      LOP                     LOAD OP REG
                          592 *
 060C 31 C5 075A          593          LIO    LALUD,X'C5'             OP REG Y --> A REG --> D REG
 0610 31 C5 0746          594          LIO    LDCSAR,X'C5'            CS ADDR --> CSAR
                          595 *
 0614 C0 87 06F9          596          B      GENADR                  GENERATE STORAGE AREA POINTER
                          597 *
 0618 C0 87 0000          598 LCSARX   B      *-*                     RETURN TO CALLING ROUTINE
                          599 *
                          600 *--------------------------------------------------------------------
                          601 *              WRITE CONTROL STORAGE
                          602 *
 061C 34 08 062F          603 WRCS     ST     WRCSX+3,ARR             SAVE RETURN ADDRESS
                          604 *
 0620 C0 87 0677          605          B      LOP                     LOAD OP REG
                          606 *
 0624 31 C5 0754          607          LIO    WRCSL,X'C5'             WRITE CONTROL STORE LEFT
 0628 31 C5 0756          608          LIO    WRCSR,X'C5'             WRITE CONTROL STORE RIGHT
                          609 *
 062C C0 87 0000          610 WRCSX    B      *-*                     RETURN TO CALLING ROUTINE
                          611 *
                          612 *--------------------------------------------------------------------
                          613 *              READ CONTROL STORAGE
                          614 *
 0630 34 08 0662          615 RDCS     ST     RDCSX+3,ARR             SAVE RETURN ADDRESS
                          616 *
 0634 31 C5 0738          617          LIO    LOPC,X'C5'              RESET OP REG C
 0638 31 C5 073A          618          LIO    LOPCR,X'C5'             RESET OP REG CR
 063C 31 C5 073C          619          LIO    LOPY,X'C5'              RESET OP REG Y
 0640 31 C5 074E          620          LIO    CSACC,X'C5'             CONTROL STORE --> OP REG
                          621 *
 0644 C0 87 06AD          622          B      SOP                     SENSE OP REGISTER
                          623 *
 0648 39 20 0938          624          TBF    C,BIT2                  GO TO
 064C 39 20 0934          625          TBF    IOPIN,BIT2                EXIT IF
 0650 F2 10 0C            626          JT     RDCSX                       NO INVERT BITS ON
                          627 *
 0653 38 20 0938          628          TBN    C,BIT2                  ADJUST FOR
 0657 38 20 0934          629          TBN    IOPIN,BIT2                HARDWARE INVERSION OF
 065B C0 90 06D1          630          BF     INVERT                      OP REG BITS IF REQUIRED
                          631 *
 065F C0 87 0000          632 RDCSX    B      *-*                     RETURN TO CALLING ROUTINE
                          633 *
                          634 *--------------------------------------------------------------------
                          635 *              LOAD OP REG AND EXECUTE MICRO-INSTRUCTION
                          636 *
 0663 34 08 0676          637 LXOP     ST     LXOPX+3,ARR             SAVE RETURN ADDRESS
                          638 *
 0667 C0 87 0677          639          B      LOP                     LOAD OP REG
                          640 *
 066B 31 C5 0730          641          LIO    K04,X'C5'               RESET K2 (SERVICE MODE)
 066F 31 C5 0758          642          LIO    PROC,X'C5'              SERVICE PROCESS CYCLE
                          643 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0673 C0 87 0000          644 LXOPX    B      *-*                     RETURN TO CALLING ROUTINE
                          645 *
                          646 *--------------------------------------------------------------------
                          647 *              LOAD OP REGISTER
                          648 *
 0677 34 08 06AC          649 LOP      ST     LOPX+3,ARR              SAVE RETURN ADDRESS
                          650 *
 0678 31 C5 0732          651          LIO    K024,X'C5'              SET K4 (SERVICE MODE)
                          652 *
 067F 3C 08 0940          653          MVI    WORKN,X'08'             BUILD SVP
 0683 0C 00 093F 0938     654          MVC    WORKN-1(1),C              INTERFACE CONTROL
 0689 31 C5 0940          655          LIO    WORKN,X'C5'             LOAD OP REG C
                          656 *
 068D 3A 02 0940          657          SBN    WORKN,BIT6              BUILD SVP
 0691 0C 00 093F 0939     658          MVC    WORKN-1(1),CR             INTERFACE CONTROL
 0697 31 C5 0940          659          LIO    WORKN,X'C5'             LOAD OP REG CR
                          660 *
 069B 3A 01 0940          661          SBN    WORKN,BIT7              BUILD SVP
 069F 0C 00 093F 093A     662          MVC    WORKN-1(1),Y              INTERFACE CONTROL
 06A5 31 C5 0940          663          LIO    WORKN,X'C5'             LOAD OP REG Y
                          664 *
 06A9 C0 87 0000          665 LOPX     B      *-*                     RETURN TO CALLING ROUTINE
                          666 *
                          667 *
                          668 *--------------------------------------------------------------------
                          669 *              SENSE OP REG
                          670 *
 06AD 34 08 06D0          671 SOP      ST     SOPX+3,ARR              SAVE RETURN ADDRESS
                          672 *
 06B1 31 C7 0738          673          LIO    SOPC,X'C7'              SENSE OP REG C
 06B5 30 C7 0940          674          SNS    WORKN,X'C7'
 06B9 31 C7 073A          675          LIO    SOPCR,X'C7'             SENSE OP REG CR AND Y
 06BD 30 C7 0935          676          SNS    IOPIN+1,X'C7'
                          677 *
 06C1 0C 00 0936 0934     678          MVC    IOPIN+2(1),IOPIN        MOVE VALUES SENSED
 06C7 0C 00 0934 0940     679          MVC    IOPIN(1),WORKN            TO INPUT WORK AREA
                          680 *
 06CD C0 87 0000          681 SOPX     B      *-*                     RETURN TO CALLING ROUTINE
                          682 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          684 ********************************************************************
                          685 *                                                                  *
                          686 *                  DATA PROCESSING SUBROUTINES                     *
                          687 *                                                                  *
                          688 ********************************************************************
                          689 *
                          690 *            ADJUST FOR HARDWARE INVERTED OP REG BITS
                          691 *
 06D1 34 08 C6F8          692 INVERT   ST    IVRTX+3,ARR             SAVE RETURN ADDRESS
                          693 *
 06D5 0C 02 0940 0911     694          MVC   WORKN(3),NEG1
 06DB 0F 02 0940 0936     695          SLC   WORKN(3),IOPIN+2        RESTORE
 06E1 3B E0 093E          696          SBF   WORKN-2,X'E0'             HARDWARE
 06E5 3B 1F 0934          697          SBF   IOPIN,X'1F'                 INVERTED
 06E9 0E 00 0934 093E     698          ALC   IOPIN(1),WORKN-2              OP REG BITS
 06EF 0C 01 0936 0940     699          MVC   IOPIN+2(2),WORKN
                          700 *
 06F5 C0 87 0000          701 IVRTX    B     *-*                       RETURN TO CALLING ROUTINE
                          702 *
                          703 *--------------------------------------------------------------------
                          704 *            GENERATE MICROCODE STORAGE AREA ADDRESS
                          705 *
 06F9 34 08 072A          706 GENADR   ST    GENAX+3,ARR             SAVE RETURN ADDRESS
                          707 *
 06FD 0C 01 0940 093C     708          MVC   WORKN(2),CSAR           CONTROL STG ADDR TO WORK AREA
 0703 0E 00 0940 0940     709          ALC   WORKN(1),WORKN          DROP LEFT/RIGHT SELECT BIT
                          710 *
 0709 C2 01 1000          711          LA    UCODE,XR1               POINT TO MICROCODE STG AREA
 070D 36 01 0940          712          A     WORKN,XR1               ADD ADJUSTED CONTROL STORE ADDR
                          713 *
 0711 3C FE 093E          714          MVI   WORKN-2,X'FE'           SETUP SHIFT TERMINATOR
                          715 *
 0715 0E 02 0940 0940     716 GENALP   ALC   WORKN(3),WORKN          SHIFT CONTROL STORE
 0718 38 80 093E          717          TBN   WORKN-2,BIT0              ADDRESS LEFT UNTIL RIGHT
 071F C0 10 0715          718          BT    GENALP                      JUSTIFIED ON BYTE BOUNDARY
                          719 *
 0723 36 01 093F          720          A     WORKN-1,XR1             ADD ADJUSTED CONTROL STG ADDR
                          721 *
 0727 C0 87 0000          722 GENAX    B     *-*                     RETURN TO CALLING ROUTINE
                          723 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          725 ********************************************************************
                          726 *                                                                  *
                          727 *              SVP INTERFACE CONTROL CONSTANTS                     *
                          728 *                                                                  *
                          729 ********************************************************************
                          730 *
 072B 0001                731 RSPCR    DC    XL2'0001'               RESET PCR LATCH AND X REG
 072D 0002                732 RNMODE   DC    XL2'0002'               RESET K REG (RUN MODE)
 072E                     733 SIDLE    EQU   RNMODE                  SENSE IDLE STATUS
 072F 8802                734 K04      DC    XL2'8802'               SET K0 AND K4 (HALT IOP)
 0731 A802                735 K024     DC    XL2'A802'               SET K2 (SERVICE MODE)
 0733 9802                736 K034     DC    XL2'9802'               SET K3 (CLOCK RESET)
 0735 0005                737 SPTR     DC    XL2'0005'               SENSE ACCESS POINTER REG
 0737 0008                738 LOPC     DC    XL2'0008'               LOAD OP REG C
 0738                     739 SOPC     EQU   LOPC                    SENSE OP REG C
 0738                     740 SINDEX   EQU   SOPC                    SENSE INDEX REG
 0739 000A                741 LOPCR    DC    XL2'000A'               LOAD OP REG CR
 073A                     742 SOPCR    EQU   LOPCR                   SENSE OP REG CR
 073B 000B                743 LOPY     DC    XL2'000B'               LOAD OP REG Y
 073D 000C                744 LEXTAR   DC    XL2'000C'               R3-R7 --> EXT ADDR REG (EXTAR)
 073F 010C                745 LEXTZ    DC    XL2'010C'               R4-R7 --> EXTERNAL ZONE REG
 0741 000D                746 SALSB    DC    XL2'000D'               SENSE ALSB
 0743 020D                747 LEXT     DC    XL2'020D'               D REG --> EXTERNAL REG
 0745 080D                748 LDCSAR   DC    XL2'080D'               LOAD CSAR
 0747 0C0D                749 LCSADR   DC    XL2'0C0D'               LOAD CSAR AND ADDR COMPARE REG
 0749 000E                750 RUNIOP   DC    XL2'000E'               START MICRO-PROCESSOR
 074B 0C0E                751 INACC    DC    XL2'0C0E'               INITIAL ACCESS CYCLE
 074D 0E0E                752 CSACC    DC    XL2'0E0E'               CONTROL STORE --> OP REG
 074F 8E0E                753 SVACC    DC    XL2'8E0E'               SERVICE ACCESS CYCLE
 0751 8B0E                754 LINDEX   DC    XL2'8B0E'               LOAD INDEX REG
 0753 AE0E                755 WRCSL    DC    XL2'AE0E'               WRITE CONTROL STORE LEFT
 0755 CE0E                756 WRCSR    DC    XL2'CE0E'               WRITE CONTROL STORE RIGHT
 0757 000F                757 PROC     DC    XL2'000F'               SERVICE PROCESS CYCLE
 0759 020F                758 LALUD    DC    XL2'020F'               OP REG Y --> A REG --> D REG
                          759 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                          761 ********************************************************************************
                          762 *                                                                              *
                          763 *                CONSTANTS AND RESERVED STORAGE AREAS                          *
                          764 *                                                                              *
                          765 ********************************************************************************
                          766 *
  0880                    767         ORG   X'0880'              RESERVED FOR
                    0880  768 INPUT   EQU   *                      CARD READ IN AREA
  0880                    769         DS    XL128
                          770 *
  0900 00000000     0903  771 NULLS   DC    4XL1'00'
  0904 0001         0905  772 ONE     DC    IL2'1'
  0906 0002         0907  773 TWO     DC    IL2'2'
  0908 0003         0909  774 THREE   DC    IL2'3'
  090A 0004         090B  775 FOUR    DC    IL2'4'
  090C 0008         090D  776 EIGHT   DC    IL2'8'
  090E FFFFFFFF     0911  777 NEG1    DC    IL4'-1'
                          778 *
  0912 F1           0912  779 D1      DC    CL1'1'
                          780 *
  0913 03FFFF       0915  781 X3FFF   DC    XL3'03FFFF'          CS DATA AREA TEST PATTERN
  0916 10           0916  782 X10     DC    XL1'10'
                          783 *
                    0917  784 EXTBL   EQU   *                    EXTERNAL
  0917 2D80         0918  785 FTR     DC    XL2'2D80'              REGISTER
  0919 2D00         091A  786         DC    XL2'2D00'                ADDRESS
  091B 2F00         091C  787 SCN     DC    XL2'2F00'                  TABLE
  091D 3300         091E  788 DXC     DC    XL2'3300'
  091F 2500         0920  789 FTG     DC    XL2'2500'
  0921 238F         0922  790 DST     DC    XL2'238F'
  0923 2300         0924  791         DC    XL2'2300'
  0925 2780         0926  792 FHF     DC    XL2'2780'
  0927 2700         0928  793         DC    XL2'2700'
  0929 3F00         092A  794 SBO     DC    XL2'3F00'
  092B FF           092B  795         DC    XL1'FF'              TERMINATOR
                          796 *
  092C 00           092C  797 IND     DC    XL1'0'               PROGRAM INDICATORS
                          798 *
  092D C6C1F0       092F  799 FA0ID   DC    CL3'FA0'             MICROCODE SECTION ID
                          800 *
  0930              0933  801 SEQ     DS    CL4                  CURRENT CARD SEQUENCE NUMBER
                          802 *
                    0934  803 IOPIN   EQU   *                    COMMON IOP SENSE
  0934              0937  804         DS    XL4                    DATA STORAGE AREA
                          805 *
  0938              093A  806 OPREG   DS    XL3                  OP REG DATA STORAGE AREA
                    0938  807 C       EQU   OPREG-2              OP REG C BYTE
                    0939  808 CR      EQU   OPREG-1              OP REG CR BYTE
                    093A  809 Y       EQU   OPREG                OP REG Y BYTE
                          810 *
  093B              093C  811 CSAR    DS    XL2                  CONTROL STORE ADDRESS
                    093B  812 CSARB   EQU   CSAR-1               CSAR BLOCK BYTE
                    093C  813 CSARD   EQU   CSAR                 CSAR DISPLACEMENT BYTE
                          814 *
                    093D  815 WORK    EQU   *                    GENERAL PURPOSE
  093D              0940  816 WORKN   DS    XL4                    WORK AREA
                          817 *
  7600                    818         ORG   X'7600'
                    7600  819 PATCH   EQU   *                    MICROCODE PATCH AREA
  7600 FFFFFFFFFFFFFFFF 77FF 820      DC    512XL1'FF'
  7608 FFFFFFFFFFFFFFFF       820
  7610 FFFFFFFFFFFFFFFF       820
  7618 FFFFFFFFFFFFFFFF       820
  7620 FFFFFFFFFFFFFFFF       820
  7628 FFFFFFFFFFFFFFFF       820
  7630 FFFFFFFFFFFFFFFF       820
  7638 FFFFFFFFFFFFFFFF       820
  7640 FFFFFFFFFFFFFFFF       820
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
  7648 FFFFFFFFFFFFFFFF       820
  7650 FFFFFFFFFFFFFFFF       820
  7658 FFFFFFFFFFFFFFFF       820
  7660 FFFFFFFFFFFFFFFF       820
  7668 FFFFFFFFFFFFFFFF       820
  7670 FFFFFFFFFFFFFFFF       820
  7678 FFFFFFFFFFFFFFFF       820
  7680 FFFFFFFFFFFFFFFF       820
  7688 FFFFFFFFFFFFFFFF       820
  7690 FFFFFFFFFFFFFFFF       820
  7698 FFFFFFFFFFFFFFFF       820
  76A0 FFFFFFFFFFFFFFFF       820
  76A8 FFFFFFFFFFFFFFFF       820
  76B0 FFFFFFFFFFFFFFFF       820
  76B8 FFFFFFFFFFFFFFFF       820
  76C0 FFFFFFFFFFFFFFFF       820
  76C8 FFFFFFFFFFFFFFFF       820
  76D0 FFFFFFFFFFFFFFFF       820
  76D8 FFFFFFFFFFFFFFFF       820
  76E0 FFFFFFFFFFFFFFFF       820
  76E8 FFFFFFFFFFFFFFFF       820
  76F0 FFFFFFFFFFFFFFFF       820
  76F8 FFFFFFFFFFFFFFFF       820
  7700 FFFFFFFFFFFFFFFF       820
  7708 FFFFFFFFFFFFFFFF       820
  7710 FFFFFFFFFFFFFFFF       820
  7718 FFFFFFFFFFFFFFFF       820
  7720 FFFFFFFFFFFFFFFF       820
  7728 FFFFFFFFFFFFFFFF       820
  7730 FFFFFFFFFFFFFFFF       820
  7738 FFFFFFFFFFFFFFFF       820
  7740 FFFFFFFFFFFFFFFF       820
  7748 FFFFFFFFFFFFFFFF       820
  7750 FFFFFFFFFFFFFFFF       820
  7758 FFFFFFFFFFFFFFFF       820
  7760 FFFFFFFFFFFFFFFF       820
  7768 FFFFFFFFFFFFFFFF       820
  7770 FFFFFFFFFFFFFFFF       820
  7778 FFFFFFFFFFFFFFFF       820
  7780 FFFFFFFFFFFFFFFF       820
  7788 FFFFFFFFFFFFFFFF       820
  7790 FFFFFFFFFFFFFFFF       820
  7798 FFFFFFFFFFFFFFFF       820
  77A0 FFFFFFFFFFFFFFFF       820
  77A8 FFFFFFFFFFFFFFFF       820
  77B0 FFFFFFFFFFFFFFFF       820
  77B8 FFFFFFFFFFFFFFFF       820
  77C0 FFFFFFFFFFFFFFFF       820
  77C8 FFFFFFFFFFFFFFFF       820
  77D0 FFFFFFFFFFFFFFFF       820
  77D8 FFFFFFFFFFFFFFFF       820
  77E0 FFFFFFFFFFFFFFFF       820
  77E8 FFFFFFFFFFFFFFFF       820
  77F0 FFFFFFFFFFFFFFFF       820
  77F8 FFFFFFFFFFFFFFFF       820
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          822 ************************************************************
                          823 *
                          824 *                        SYMBOL DEFINITIONS
                          825 *
                          826 ************************************************************
                          827 *
                          828 *              LOCAL STORE REGISTERS
                          829 *
0001                      830 XR1      EQU   X'01'              INDEX REGISTER 1
0002                      831 XR2      EQU   X'02'              INDEX REGISTER 2
0008                      832 ARR      EQU   X'08'              ADDRESS RECALL REG (CURRENT LEVEL)
                          833 *
                          834 *-------------------------------------------------------------
                          835 *              HALT IDENTIFIERS
                          836 *
006F                      837 H0       EQU   X'6F'
0003                      838 H1       EQU   X'03'
0076                      839 H2       EQU   X'76'
0057                      840 H3       EQU   X'57'
0018                      841 H4       EQU   X'1B'
005D                      842 H5       EQU   X'5D'
003B                      843 HH       EQU   X'3B'
007C                      844 HE       EQU   X'7C'
                          845 *
                          846 *-------------------------------------------------------------
                          847 *              PROGRAM INDICATORS
                          848 *
0080                      849 SEQCK    EQU   X'80'              CARD SEQUENCE CK INITIATED
                          850 *
                          851 *-------------------------------------------------------------
                          852 *              BIT POSITION SYMBOLS
                          853 *
0080                      854 BIT0     EQU   X'80'
0040                      855 BIT1     EQU   X'40'
0020                      856 BIT2     EQU   X'20'
0008                      857 BIT4     EQU   X'08'
0002                      858 BIT6     EQU   X'02'
0001                      859 BIT7     EQU   X'01'
                          860 *
                          861 *-------------------------------------------------------------
                          862 *              OTHER REFERENCES EXTERNAL TO THIS SECTION
                          863 *
0880                      864 REC      EQU   INPUT              LOAD SUBROUTINE INPUT AREA
08D4                      865 RECN     EQU   REC+84             END OF MICROCODE TEXT RECORD
00FF                      866 LDWORK   EQU   CDREAD-1           TEMPORARY STORAGE LOCATION
                          867 *
1000                      868 UCODE    EQU   X'1000'       ATTACHMENT MICROCODE STORAGE AREA     REH
                          869 *
                          870 *
                          871 *
                          872 * NOTE * NOTE * NOTE * NOTE * NOTE * NOTE * NOTE * NOTE * NOTE * NOTE *
                          873 *
                          874 *      FIXED LOCATION X'1FFA' AND X'1FFB' MUST CONTAIN X'0200'
                          875 *      BECAUSE FE0(1442) AND FD0(2560) LOADERS PICK UP THE
                          876 *      STARTING ADDRESS OF THIS PROGRAM(WHICH IS '0200') FROM THESE
                          877 *      LOCATIONS.
                          878 *
1FFA                      879          ORG   X'1FFA'
1FFA 0200            1FFB 880          DC    XL2'0200'
                          881 *
FFFF                      882          END
```


CROSS-REFERENCE

```
SYMBOL   T LEN VALUE  DEFN   REFERENCES
AINPUT   A 001  0107  0077   0085
ALSLD    A 004  041D  0381   0398
ARR      C 001  0008  0832   0078  0585  0603  0615  0637  0649  0671  0692  0706
A1       A 006  02A6  0209   0202* 0203  0206  0214* 0216
A2       A 006  02AC  0210   0203*
BIT0     C 001  0080  0854   0270  0273  0480  0508  0517  0520  0544  0547  0717
BIT1     C 001  0040  0855   0140
BIT2     C 001  0020  0856   0372  0384  0392  0397  0411  0511  0512  0523  0550  0624  0625  0628
                             0629
BIT4     C 001  0008  0857   0319
BIT6     C 001  0002  0858   0657
BIT7     C 001  0001  0859   0387  0569  0661
BOOTS    A 004  0000  0022   0020  0021  0042  0042*
BOOT1    A 003  0008  0024   0047
BOOT1A   A 003  000E  0026   0030  0043
BOOT1E   A 003  004B  0046   0028  0039
BOOT11   A 002  0052  0049   0032
C        A 003  0938  0807   0270  0285* 0288* 0292* 0295* 0296* 0302* 0307* 0341* 0364* 0378* 0403*
                             0417* 0500* 0512* 0531* 0587* 0624  0628  0654
CDEXIT   A 004  0147  0099   0078* 0095
CDREAD   A 004  0100  0075   0074  0075  0112  0126  0866
CKCARD   A 004  0240  0161   0154  0157
CKID     A 005  024E  0168   0164
CKREP    A 004  0181  0121   0114
CKTYPE   A 004  02C4  0222   0179
CLRSTG   A 003  0204  0137   0141
CMPRS    A 004  028F  0200   0182
CMPO1    A 006  0297  0203   0217
CR       A 003  0939  0808   0276* 0344* 0365* 0370* 0372  0379* 0384* 0387* 0392* 0395* 0397  0404*
                             0409* 0411  0418* 0588* 0658
CSACC    A 002  074E  0752   0620
CSAR     A 002  093C  0811   0236* 0263* 0474* 0526* 0708  0812  0813
CSARB    A 002  093B  0812   0521* 0523  0548* 0550  0588
CSARD    A 002  093C  0813   0273  0515* 0517  0520* 0542* 0544  0547* 0589
DDSIO    A 003  0108  0079   0083  0102
DST      A 002  0922  0790
DXC      A 002  091E  0788
D1       A 001  0912  0779   0176
EIGHT    A 002  090D  0776   0292
ENDHLT   A 003  05ED  0572   0573
EOJCHK   A 003  0135  0093   0097
ERR      A 003  014B  0101   0081  0091
EXTBL    A 001  0917  0784   0339
EXTRST   A 004  03CC  0344   0359
FAOID    A 003  092F  0799   0168
FHF      A 002  0926  0792
FOUR     A 002  090B  0775   0370
FTG      A 002  0920  0789
FTR      A 002  0918  0785
FUNBT1   A 002  0058  0052   0025
GENADR   A 004  06F9  0706   0237  0264  0596
GENALP   A 006  0715  0716   0718
GENAX    A 004  0727  0722   0706*
GG       A 004  05C5  0560
GOLP     A 006  05D7  0566   0570
HE       C 001  007C  0844   0572  0572
HH       C 001  003B  0843   0046  0101
H0       C 001  006F  0837   0186  0193  0463  0538
H1       C 001  0003  0838   0186
H2       C 001  0076  0839   0193
H3       C 001  0057  0840   0538
H4       C 001  001B  0841   0463
H5       C 001  005D  0842   0046  0101
IDERR    A 003  0279  0186   0169
INACC    A 002  074C  0751   0560
IND      A 001  092C  0797   0171* 0188
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
INPUT	A	001	0880	0768	0076 0152 0153 0156 0161 0864
INVERT	A	004	06D1	0692	0630
IOPERR	A	003	04EB	0463	0441 0450 0458 0567
IOPIN	A	001	0934	0803	0488 0496 0505 0535 0568* 0569 0625 0629 0676* 0678 0678* 0679* 0695 0697* 0698* 0699*
IVRTX	A	004	06F5	0701	0692*
K024	A	002	0732	0735	0443 0651
K034	A	002	0734	0736	0334 0445
K04	A	002	0730	0734	0333 0431 0641
LALUD	A	002	075A	0758	0353 0422 0428 0593
LCSADR	A	002	0748	0749	0429
LCSAR	A	004	05F4	0585	0476 0528
LCSARX	A	004	0618	0598	0585*
LDADDR	A	002	01FD	0126	0146
LDCS	A	006	04F2	0474	0461 0540
LDCSAR	A	002	0746	0748	0594
LDCSO1	A	004	04F8	0476	0518 0524
LDCSO2	A	005	0533	0499	0481
LDCSO3	A	006	055E	0515	0506
LDCSO4	A	004	0584	0528	0545 0551
LDCSO5	A	003	059E	0538	0489 0497 0509
LDCSO6	A	006	05A5	0542	0536
LDS	A	001	0000	0007	
LDWORK	A	004	00FF	0866	
LENCT1	A	002	0054	0050	0033
LENCT2	A	002	0152	0104	0086
LEXT	A	002	0744	0747	0354
LEXTAR	A	002	073E	0744	0352
LEXTZ	A	002	0740	0745	0347
LINDEX	A	002	0752	0754	0423
LOADER	A	004	0200	0135	
LOP	A	004	0677	0649	0345 0350 0420 0426 0591 0605 0639
LOPC	A	002	0738	0738	0617 0739
LOPCR	A	002	073A	0741	0618 0742
LOPX	A	004	06A9	0665	0649*
LOPY	A	002	073C	0743	0619
LPTONE	A	004	0171	0117	
LXOP	A	004	0663	0637	0368 0382 0385 0390 0393 0407
LXOPX	A	004	0673	0644	0637*
MBRST	A	004	0403	0368	0373
MOVE	A	005	0178	0119	0116* 0117*
MPHLT	A	003	03B5	0331	0465
NEG1	A	004	0911	0777	0212 0694
NEG4	A	002	0158	0107	
NEXTC	A	004	0159	0109	0044
NEXTR	A	004	0163	0112	0120
NULLS	A	001	0903	0771	0457 0474 0483 0526
N1	A	002	0156	0106	
ONE	A	002	0905	0772	0214 0395 0409 0515 0521 0542 0548 0564 0566
OPREG	A	003	093A	0806	0268* 0300 0309 0483* 0488 0491* 0496 0499* 0505 0530* 0535 0807 0808 0809
PATCH	A	001	7600	0819	0258
PROC	A	002	0758	0757	0642
RDCS	A	004	0630	0615	0486 0494 0503 0533
RDCSX	A	004	065F	0632	0615* 0626
READ	A	004	023C	0159	0148* 0184 0191 0195 0228 0234 0249
READER	A	004	0216	0146	
READ1	A	004	0222	0150	0147* 0189
REC	A	001	0880	0864	0216 0222 0225 0233 0236 0239 0246* 0865
RECN	A	001	08D4	0865	0200 0209 0209* 0210 0210* 0216
REPFA0	A	004	0305	0258	0223
REPX	A	003	03A6	0317	0261
REP01	A	003	0309	0260	0320
REP02	A	005	030F	0263	
REP05	A	005	031B	0268	0315
REP06	A	005	0336	0279	0274

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
REP07	A	006	033B	0281	0277
REP08	A	006	0341	0283	0286
REP09	A	004	0350	0286	0284
REP10	A	006	0358	0290	0293
REP11	A	004	0367	0293	0291
REP12	A	006	0376	0300	0271
REP13	A	006	037C	0302	0304
REP14	A	006	0382	0303	0305
REP15	A	005	0394	0309	0298
REP16	A	003	0399	0311	
RNMODE	A	002	072E	0732	0561 0733
RSPCR	A	002	072C	0731	0432
RUNIOP	A	002	074A	0750	0562
SALSB	A	002	0742	0746	0452
SB0	A	002	092A	0794	
SCN	A	002	091C	0787	
SEQ	A	004	0933	0801	0152* 0156* 0173 0176*
SEQCK	C	001	0080	0849	0171 0188
SEQERR	A	003	0288	0193	0174
SIDLE	A	002	072E	0733	0437
SINDEX	A	002	0738	0740	0454
SNBYT1	A	002	0056	0051	0026* 0027 0029 0037* 0038
SNBYT2	A	002	0154	0105	0079* 0080 0082 0089* 0090 0093* 0094 0096
SOP	A	004	06AD	0671	0622
SOPC	A	002	0738	0739	0673 0740
SOPCR	A	002	073A	0742	0675
SOPX	A	004	06CD	0681	0671*
SPTR	A	002	0736	0737	0446
SVACC	A	002	0750	0753	0444
TEXT	A	004	02D7	0233	0226
TEXT01	A	004	02ED	0241	0247
THREE	A	002	0909	0774	0246
TWO	A	002	0907	0773	0285
UCODE	C	001	1000	0868	0135 0711
WORK	A	001	093D	0815	0281* 0283 0283* 0290 0290*
WORKN	A	004	0940	0816	0139* 0140 0300* 0303 0303* 0318* 0319 0438* 0440 0447* 0449 0453* 0455* 0457 0460 0564* 0566* 0653* 0654* 0655 0657* 0658* 0659 0661* 0662* 0663 0674* 0679 0694* 0695* 0696* 0698 0699 0708* 0709 0709* 0712 0714* 0716 0716* 0717 0720
WRCS	A	004	061C	0603	0485 0493 0502 0513
WRCSL	A	002	0754	0755	0607
WRCSR	A	002	0756	0756	0508
WRCSX	A	004	062C	0610	0603*
XR1	C	001	0001	0830	0020 0022* 0025 0026 0027 0028 0029 0030 0032 0033 0035 0037 0038 0039 0042 0042 0043 0047 0076* 0113 0116 0117 0118 0118* 0119 0135* 0137 0136 0138* 0139 0146* 0147 0148 0161* 0163 0166 0166 0168 0173 0178 0181 0200* 0205 0207 0212* 0241 0243 0243* 0276 0279 0309 0311 0311* 0339* 0349 0356 0356* 0358 0478 0480 0499 0508 0511 0530 0711* 0712* 0720*
XR2	C	001	0002	0831	0021 0023* 0040 0041 0041* 0074 0075* 0078 0079 0080 0081 0082 0083 0085 0086 0088 0089 0090 0093 0094 0096 0097 0102 0116 0117 0239* 0241 0244 0244* 0258* 0260 0263 0266 0266* 0268 0312 0312* 0314 0317 0317* 0318
X10	A	001	0916	0782	0302
X3FFF	A	003	0915	0781	0491
Y	A	003	093A	0809	0279* 0281 0342* 0349* 0366* 0381* 0389* 0405* 0419* 0425* 0589* 0662
ZLSLD	A	004	0458	0407	0412

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

THE CHARACTER ° INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
GBK GBD PN 51	32774 EC 571874	3340 STANDALONE	LOADER - 3741	84@@84@@	LDS00000
T+- :O-D <HB &C	3&O/1&N/O&5R8AEP	&UD_8 VP&U #3&O/	1JEI1&VL3&&CJ&SX	3&O/O&VR9BVP&UD>	<)PM JTYLDS00001
T+-A5 XPS XR¬ M	A4 D+OH*AO¬ #P)B	GB H G@ D &(¬	N&|P1@".7'"J &<P	C&|P7@¬T7'DA &DA	&+* OE*LDS00002
T+-D:O-H "<HABHB	4BD:O&5S8AE¬-UD=	8 V¬-U "3&OS1J >	1&V$3&&C/&SDO&VS	9BV¬2UAX3&OSO&5S	8 V* 694LDS00003
T+-E5@/ I> /Q8I	9@4<HOH* | #P;B	GCOA" ¬"@|D	H"03=B|8H"@BG &A	'1&C2-JK* X@CX B	)H)1 LDS00004
TC-FD &&* <B	G O| /OH				50 LDS00005
T &G' &					##HLDS00006
T+-H:O-D& G2 (H	A 3&ABM 8& U"OI	BACMA ¬44 &HV(D	B|@BG < OU3B(@	'9OS @-D(C <I<OT	|@Y* O.ULDS00007
T+-I5A<BG CB &S	¬;* @-DDP)¬L44	BO-U?@-DT+Y I.D4	CPOU3@-DWAT I<OU	K¬;* OHDB1G7M |H	AF% L:%LDS00008
T+-HO/OH@@F@C+H	I.<B& S. /OH@@F'	6OH*B|<HABI&@ H	XC B,GHx¬) @-D	C¬BY C- H5 TMC-	H5 - JCQLDS00009
T+-.,5CQABJD+ H	XB&M'N HXOHHBV37	EBHG -&<E|;<H-¬H	AA<BG TO' SFOHD	B| OABLOHS*BGA?X	B -- NC4LDS00010
T+-<WSWOB -.K &|	S -<| SFB&X &.	_OH*B|<HB|-B'"OC	2-R*% &U@ *BGA?X	S -H% -U: TS BLT	2UD@ @EHLDS00011
T+-(/+N I|H&BAO	BLUA@Y*EG I+-H	< &U=BLY+ U=BL#	2H Q+ U8B&¬ &(	A+"'I+ B BL4I|¬H	-A-8 "3-LDS00012
T+-+* U8B&7 &(	Q+"MI+CD&BLT2/1@	< -V BLY+ U8BJQ	+ -V BMC Y (@O D	C-T?-BL/< -HI+_H	A =H OCULDS00013
T+-|P -+'"OC &<	$8-HA(HI&C-H8L"	U <I@@J=<*MG<CG	EA3LB &UP| I+CO	BLY@ U9OH*F)3G	EA4 &Z@LDS00014
T+-&KG DI+-G /OR	7<*NG|TGEA5Y11&)	D4-DB¬¬@ O DC3CO	FBL-@- U9|H I+%B	GAW<+ U9B&%8H U	9OI #AHLDS00015
T+-J(A <@ -U@|H	I+LO BL, /ORT+S	I+*BGAW<: &U9|.@	I+%BGAW<#H U9OH*	FQO8 BLUIAL--BLX	U & J %LDS00016
T+-KHGL@CBL-@- U	9| I+%BGAW<+ U	9B&M8H U9OI DO3O	BL-@ U9|.@I+%%	GAX*11&)E<*MGMTO	BLY EEQLDS00017
T+-LCOH*F)3GEA5Y	11&)H<*MG<CGEA2O	11O*><<*I&C77BMC	&L,<*MG<TGFA5	11&*4<**G(TCGBH	'Y&U 4R*LDS00018
T+-L=&< AA+%11O)	8<<*I|TGGA3-O1OV	C&DI|OUCO DD:36	"8MC -&L2@F@$OH*	C_&OABLOI @BGA¬J	#Q 2L<LDS00019
T+-M9;H @Z >C H	I+-UCOH*FG<BGAT	(-U:BL$2 QH< -U	:BJP /OQ*OH*F< 4	BBLYI(?HAE1OBBLY	B+= :84LDS00020

IBM MAINTENANCE DIAGNOSTIC PROGRAM PART NO. 5132775
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LDS0 3340 STANDALONE MICROCODE LOADER MOD 12 - 3741

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-N4BLT /OQ*OH*	F< 4BBLYI(?HADPS	|H&K7Y- CY-BLT	/OQ*C- I| UE+H	I|<B&A|-@- U@C-	I+OU 8 OLDS00021
T+-O?AL--BL? U L	8C DI| UCOH*E'AO	BBLYB+@ I+<BGAY	(-U:BL$2-&¬O$5¬	/OL2C- I| UE+H	I|< 3:OLDS00022
T+-PDU OD+8 I| 8	BL&IAL--BL? U O	D<*HGLCGEA2811&)	HC DI& UEC-DI& U	EOH D:3CEBLH8 &U	50A ;H*LDS00023
T+-QVA)¬O¬G3 /OP	_(-FF3O BL-< U	9BL&< U:BL3 /OR	7<*HGOTGEA4$ /O$	9OH* C&HAS" /OR	7<*M =,*LDS00024
T+-R-A5&11&)OOH*	C&HAWH11&*8<*M	G+TGEA3011&)+OH*	F,LU-BL-9H U4@/	<+B I+C--BLL U $	JOH* 8#OLDS00025
T+-E$ 4B R6OH*	F)3GEA3 11&/OOH*	C&HADO11&*2| -	I& O BL@I+CGEBM	: -V C I|OU9<*M	I&CY 5ZDLDS00026
T+-$O &V C I|OU	:<*MI&<BG 4B $	&<**G+CCGBM 11O*	:<<*I'&O BLQI(O	BL&I&<BG 4B $	8C H #JHLDS00027
T+-*JBM ID&@8BM	I(T?-BL8#GOU4C-	I(U=C DI(-V OH*	C&HA2Y< &V BLO	+ V BMCB J (-D	I&CO ":*LDS00028
T+-)<"-U=C-HI& V	+H I|% &A1M6 &U	"OH* A HH D-	BW H A& H Y BO	< &O C&H(B 4<C&	<C 8 'Y4LDS00029
TC&)EC-:+CY%+,-#	+C- | -@				*/<LDS00030
T.OU? A H	O D T*****@&|	**1 _-B4 .O 3 BM	H8@T B; IO " |@	1%GO	@R@LDS00031
T+XQ:**********	**********	**********	**********	**********	***@ *:<LDS00032
T+XR5**********	**********	**********	**********	**********	***@ "H<LDS00033
T+XEO**********	**********	**********	**********	**********	***@ =K*LDS00034
T+X$,**********	**********	**********	**********	**********	***@ @S*LDS00035
T+X*W**********	**********	**********	**********	**********	***@ #2<LDS00036
T+X)/**********	**********	**********	**********	**********	***@ EB<LDS00037
T+X;**********	**********	**********	**********	**********	***@ NK@LDS00038
T+X¬P**********	**********	**********	**********	**********	***@ 7S@LDS00039
TI7¬**********	**********	**********	**********0	**********	#Z4LDS00040
T J"# -	**********	**********	**********	**********	P YLDS00041
E"**E7*=¬DC"PH$	="7M&F| | C F% ASC R A SO @			11320630750	526764H4LDS00042

LAST PAGE

E043 5203 CYCLE STEAL & HAMMER ADDRESSING TESTS

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                            2         DECK  4
                            3         SEQ   0
0A00                        4 UVWXYZ START X'A00'
                            5         TREP
                            6 ********************************************************************
                            7 *                                                                  *
                            8 *       SYSTEM/3 5203 CYCLE STEAL & HAMMER ADDRESSING TESTS        *
                            9 *                                                                  *
                           10 ********************************************************************
                           11 *       SECTION 4 - ROUTINES 1 & 2                                 *
                           12 ********************************************************************
0A00 E043            0A01  13         DC    XL2'E043'          PROGRAM IDENTIFICATION
0A02 00              0A02  14         DC    XL1'0'             FLAGS
0A03 01              0A03  15         DC    XL1'1'             CURRENT ROUTINE NUMBER
0A04 0000            0A05  16         DC    XL2'0'             RESERVED
0A06 0A0D            0A07  17         DC    AL2(RTN1)          ADDRESS OF FIRST ROUTINE PREFIX
0A08 0D36            0A09  18         DC    AL2(ERT1)          ADDRESS OF ERROR RECORDING TABLE
0A0A E05000          0A0C  19 SPUDT   DC    XL3'E05000'        UNIT DEFINITION TABLE - PRINTER
                           20 ********************************************************************
                           21 *                                                                  *
                           22 *       ROUTINE 1 - CYCLE STEAL TEST                               *
                           23 *                                                                  *
                           24 ********************************************************************
0A0D 01              0A0D  25 RTN1    DC    XL1'1'             ROUTINE NUMBER
0A0E 00              0A0E  26         DC    XL1'0'             FLAGS
0A0F 0BB7            0A10  27         DC    AL2(RTN2)          ADDRESS OF NEXT ROUTINE PREFIX
                           28 ********************************************************************
0A11 38 04 0208            29         TBN   SBYTE0,SSW05       PRINT ON MPCU
0A15 F2 90 0A              30         JF    NRTIO
0A18 C0 87 021A            31         B     PRINT              PRINT TITLE
0A1C 42              0A1C  32         DC    XL1'42'
0A1D 10              0A1D  33         DC    IL1'16'
0A1E CD01            0A1F  34         DC    AL2(TITL1)
0A20 E000            0A21  35         DC    XL2'E000'
0A22 C1 E0 0A29            36 NRTIO   TIO   BAPRT,NRDY         PRINTER READY
0A26 F2 87 14              37         J     TOGOON
0A29 38 04 0208            38 BAPRT   TBN   SBYTE0,SSW05       PRINT ON MPCU SW. ON
0A2D F2 90 0A              39         JF    MRALT
0A30 C0 87 021A            40         B     PRINT              PRINT MAKE PRINTER READY
0A34 41              0A34  41         DC    XL1'41'
0A35 1F              0A35  42         DC    IL1'31'
0A36 CD30            0A37  43         DC    AL2(MAKADY)
0A38 E0E1            0A39  44         DC    XL2'E0E1'
0A3A F0 7C 03              45 MRALT   HPL   X'03',X'7C'         HALT E1
0A3D 3C 00 0D37            46 TOGOON  MVI   LPOUNT,X'00'       ZERO LOOP COUNT
                           47 ********************************************************************
                           48 *    ISSUE PRINT AND SPACE WITH BLANK DATA FIELD                   *
                           49 ********************************************************************
0A41 31 E6 0CE8            50 KZANGO  LIO   WPDADP,LPDAR       LOAD DAR WITH WRONG ADDR.
0A45 3C 7F 0A7B            51         MVI   FORCE+1,X'7F'
0A49 39 30 0A0C            52         TBP   SPUDT,B'110000'    100 LPM?
0A4D F2 10 0E              53         JT    SUNERD
0A50 30 E2 0D32            54         SNS   STAT2,X'E2'        GRAB TIMINGS
0A54 38 02 0D31            55         TBN   STAT2-1,B'10'      HMRS.IN POS.B-1
0A58 F2 10 0B              56         JT    LOBLNK
0A5B F2 87 04              57         J     SFOUR
0A5E C0 87 0B89            58 SUNERD  B     M4DEL
0A62 3C 7C 0A7B            59 SFOUR   MVI   FORCE+1,X'7C'
0A66 3C 40 08FF            60 LOBLNK  MVI   PRDAT,X'40'       PUT A BLANK IN PRT.AREA
0A6A 0C 83 08FE 08FF       61         MVC   PRDAT-1(132),PRDAT
0A70 C0 87 0C5D            62         B     NEXIO              GO DO A PRINT & SPACE
0A74 E201            0A75  63         DC    XL2'E201'
0A76 30 E6 0D34            64         SNS   STAT6,X'E6'        SENSE DAR
0A7A 3D 00 0D34            65 FORCE   CLI   STAT6,*-*          DID DAR FORCE CORRECT ADDR.
0A7E F2 81 09              66         JE    GETIM
0A81 C0 87 0222            67         B     HALT               DAR WRONG HALT
0A85 E061            0A86  68         DC    XL2'E061'
0A87 F2 87 E9              69         J     GAWAN
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E043 5203 CYCLE STEAL & HAMMER ADDRESSING TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
0A8A 30 E2 0D32            70 GETIM   SNS   STAT2,X'E2'        SENSE TIMING BYTES
0A8E 38 10 0D32            71         TBN   STAT2,B'10000'     PC1 ON
0A92 F2 10 09              72         JT    CHPC2
0A95 C0 87 0222            73         B     HALT               PC1 NOT ON AFTER BLANK FIELD
0A99 E062            0A9A  74         DC    XL2'E062'          ERR HALT
0A9B F2 87 D5              75         J     GAWAN
0A9E 39 08 0D32            76 CHPC2   TBP   STAT2,B'1000'      PC2 OFF
0AA2 F2 10 09              77         JT    CHPC3
0AA5 C0 87 0222            78         B     HALT               PC2 NOT OFF AFTER BLANK FIELD
0AA9 E063            0AAA  79         DC    XL2'E063'          ERR HALT
0AAB F2 87 C5              80         J     GAWAN
0AAE 39 04 0D32            81 CHPC3   TBP   STAT2,B'100'       PC3 OFF
0AB2 F2 10 09              82         JT    CHHSL
0AB5 C0 87 0222            83         B     HALT               PC3 NOT OFF AFTER BLANK FIELD
0AB9 E064            0ABA  84         DC    XL2'E064'          ERR HALT
0ABB F2 87 B5              85         J     GAWAN
0ABE 39 02 0D32            86 CHHSL   TBP   STAT2,B'10'        HAMR.SET LATCH OFF
0AC2 F2 10 09              87         JT    UPCPF
0AC5 C0 87 0222            88         B     HALT               HAMR.SET LATCH ON AFTER BLANK FIELD
0AC9 E065            0ACA  89         DC    XL2'E065'          ERR HALT
0ACB F2 87 A5              90         J     GAWAN
                           91 ********************************************************************
                           92 *    ISSUE PRINT AND SPACE WITH UNPRINTABLE DATA FIELD             *
                           93 ********************************************************************
0ACE 3C FF 08FF            94 UPCPF   MVI   PRDAT,X'FF'        INSERT AN UNPRTABLE CHAR.
0AD2 0C 83 08FE 08FF       95         MVC   PRDAT-1(132),PRDAT FILL PRINAREA WITH U.P.C.
0AD8 C0 87 0C59            96         B     XIO                ISSUE A PRINT & SPACE
0ADC E201            0ADD  97         DC    XL2'E201'
0ADE 30 E2 0D32            98         SNS   STAT2,X'E2'        SENSE TIMING BYTES
0AE2 38 10 0D32            99         TBN   STAT2,B'10000'     PC1 ON
0AE6 F2 10 09             100         JT    CKPC2
0AE9 C0 87 0222           101         B     HALT               PC1 NOT ON AFTER UPC FIELD
0AED E066            0AEE 102         DC    XL2'E066'          ERR HALT
0AEF F2 87 81             103         J     GAWAN
0AF2 38 08 0D32           104 CKPC2   TBN   STAT2,B'1000'      PC2 ON
0AF6 F2 10 09             105         JT    CKPC3
0AF9 C0 87 0222           106         B     HALT               PC2 NOT ON AFTER UPC FIELD
0AFD E067            0AFE 107         DC    XL2'E067'          ERR HALT
0AFF F2 87 71             108         J     GAWAN
0B02 39 04 0D32           109 CKPC3   TBP   STAT2,B'100'       PC3 OFF
0B06 F2 10 09             110         JT    CKHSL
0B09 C0 87 0222           111         B     HALT               PC3 ON AFTER UPC FIELD
0B0D E068            0B0E 112         DC    XL2'E068'          ERR HALT
0B0F F2 87 61             113         J     GAWAN
0B12 39 02 0D32           114 CKHSL   TBP   STAT2,B'10'        HAMR.SET LATCH OF
0B16 F2 10 09             115         JT    GUDPF
0B19 C0 87 0222           116         B     HALT               HAMR.SET LATCH ON AFTER UPC FIELD
0B1D E069            0B1E 117         DC    XL2'E069'          ERROR HALT
0B1F F2 87 51             118         J     GAWAN
                          119 ********************************************************************
                          120 *    ISSUE A PRINT AND SPACE WITH PRINTABLE DATA FIELD             *
                          121 ********************************************************************
0B22 3C C8 08FF           122 GUDPF   MVI   PRDAT,C'H'         INSERT AN'H'
0B26 0C 83 08FE 08FF      123         MVC   PRDAT-1(132),PRDAT PROPAGATE IT
0B2C C0 87 0C59           124         B     XIO                ISSUE A PRINT & SPACE
0B30 E201            0B31 125         DC    XL2'E201'
0B32 30 E2 0D32           126         SNS   STAT2,X'E2'        SENSE TIMING BYTES
0B36 38 10 0D32           127         TBN   STAT2,B'10000'     PC1 ON
0B3A F2 10 09             128         JT    CHKPC2
0B3D C0 87 0222           129         B     HALT               PC1 NOT ON AFTER PRTABLE FIELD
0B41 E06A            0B42 130         DC    XL2'E06A'          ERR HALT
0B43 F2 87 2D             131         J     GAWAN
0B46 38 08 0D32           132 CHKPC2  TBN   STAT2,B'1000'      PC2 ON
0B4A F2 10 09             133         JT    CHKPC3
0B4D C0 87 0222           134         B     HALT               PC2 NOT ON AFTER PRTABLE FIELD
0B51 E06C            0B52 135         DC    XL2'E06C'          ERR HALT
0B53 F2 87 1D             136         J     GAWAN
0B56 38 04 0D32           137 CHKPC3  TBN   STAT2,B'100'       PC3 ON
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0B5A F2 10 09                138         JT    CHKHSL
   0B5D C0 87 0222              139         B     HALT                 PC3 NOT ON AFTER PRTABLE FIELD
   0B61 E06E              0B62  140         DC    XL2'E06E'            ERR HALT
   0B63 F2 87 0D                141         J     GAWAN
   0B66 38 02 0D32              142 CHKHSL  TBN   STAT2,B'10'         HAMR.SET LATCH ON
   0B6A F2 10 06                143         JT    GAWAN
   0B6D C0 87 0222              144         B     HALT                 HAMP.SET LATCH OFF AFTER PRTABLE
   0B71 E06F              0B72  145         DC    XL2'E06F'            FIELD --ERR HALT
   0B73 0E 00 0D37 0CE2         146 GAWAN   ALC   LPOUNT(1),ONE        ADD TO LOOP COUNT
   0B79 C0 87 0212              147         B     TEST
   0B7D 3D 14 0D37              148         CLI   LPOUNT,X'14'         20 TIMES THRU
   0B81 C0 82 0A41              149         BL    KZANGO
   0B85 C0 87 0216              150         B     LINK                 GEDOUT
                                151
                                152 ********************************************************************
                                153 *    WAIT FOR M4     THEN DELAY SUBROUTINE                         *
                                154 ********************************************************************
   0B89 34 08 0BB6              155 M4DEL   ST    MEXIT+3,ARR          SET RETURN
   0B8D 30 E2 0D32              156 MITFG   SNS   STAT2,X'E2'          GET TIMING
   0B91 38 01 0D32              157         TBN   STAT2,B'1'           HAMMERS IN M4
   0B95 C0 90 0B8D              158         BP    MITFG
   0B99 3C 28 0D39              159         MVI   MSECS,X'28'          40 MSEC DELAY
   0B9D 0D FF 0800 0800         160 WAT     CLC   LPI(256),LPI         DELAY 1 MSEC.
   0BA3 0D 3B 0800 0800         161         CLC   LPI(60),LPI
   0BA9 0F 00 0D39 0CE2         162         SLC   MSECS(1),ONE         DECR. DELAY COUNT
   0BAF C0 84 0B9D              163         BH    WAT
   0BB3 C0 87 0000              164 MEXIT   B     *-*                  RETURN
                                165
                                166 ********************************************************************
                                167 *                                                                  *
                                168 *    ROUTINE 2 - HAMMER ADDRESSING TEST                            *
                                169 *                                                                  *
                                170 ********************************************************************
   0BB7 02                0BB7  171 RTN2    DC    XL1'2'               ROUTINE NUMBER
   0BB8 00                0BB8  172         DC    XL1'0'               FLAGS
   0BB9 FFFF              0BBA  173         DC    XL2'FFFF'            LAST ROUTINE
   0BBB 30 FF 0208              174 ********************************************************************
   0BBF F2 90 0A                175         TBN   SBYTE0,SSW05         PRINT ON MFCU
   0BC2 C0 87 021A              176         JF    RETIO
   0BC6 42                0BC6  177         B     PRINT                PRINT TITLE
   0BC7 10                0BC7  178         DC    XL1'42'
   0BC8 0D11              0BC9  179         DC    IL1'16'
   0BCA E000              0BCB  180         DC    AL2(TITL2)
   0BCC C1 E0 0BD3              181         DC    XL2'E000'
   0BD0 F2 87 14                182 RETIO   TIO   TRPAB,NRDY           PRINTER READY
   0BD3 38 04 0208              183         J     LANE
   0BD7 F2 90 0A                184 TRPAB   TBN   SBYTE0,SSW05         PRINT ON MFCU SW. ON
   0BDA C0 87 021A              185         JF    MHALT
   0BDE 41                0BDE  186         B     PRINT                PRINT MAKE PRINTER READY
   0BDF 1F                0BDF  187         DC    XL1'41'
   0BE0 0D30              0BE1  188         DC    IL1'31'
   0BE2 E0E1              0BE3  189         DC    AL2(MAKADY)
   0BE4 F0 7C C3                190         DC    XL2'E0E1'
   0BE7 3C C3 0D37              191 MHALT   HPL   X'03',X'7C'            HALT E1
   0BEB C2 02 FFE8              192 LANE    MVI   LPOUNT,3               SET LOOP COUNT OF 3
   0BEF 39 06 0A0C              193 LANEG   LA    NEG24,XR2              LOAD A NEG. 24
   0BF3 F2 10 0F                194         TBF   SPUDT,B'110'           96 PRINT POS.
   0BF6 C2 02 FFE2              195         JT    FOUNIT
   0BFA 38 04 0A0C              196         LA    NEG30,XR2              LOAD A NEG.30 FOR HAMR.COUNT
   0BFE F2 10 04                197         TBN   SPUDT,B'100'           120 PRINT POS.
   0C01 C2 02 FFDF              198         JT    FOUNIT
   0C05 C2 01 087F              199         LA    NEG33,XR2              LOAD A NEG.33 FOR HAMR.COUNT
   0C09 4C 03 00 0CEE           200 FOUNIT  LA    LPD+3,XR1              LOAD DATA AREA ADDR.
   0C0E C0 87 0C59              201 ZIPIT   MVC   0(4,XR1),EXES           PUT 4 X'S IN DATA AREA
   0C12 E201              0C13  202         B     XIO                    GO PRINT
   0C14 C0 87 0212              203         DC    XL2'E201'
   0C18 D2 01 04                204         B     TEST                   GO READ DATA SWITCHES
                                205         LA    4(,XR1),XR1            ADD 4 TO DATA AREA ADDR.
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0C1B 36 02 0CE2              206         A     ONE,XR2                ADD 1 TO HAMR.COUNT
   0C1F C0 01 0C09              207         BNZ   ZIPIT                  BR TO DO NEXT HAMR.
   0C23 0F 00 0D37 0CE2         208         SLC   LPOUNT(1),ONE          DECR. LOOP COUNT
   0C29 C0 C1 0BEB              209         BNZ   LANEG
   0C2D C0 87 0216              210         B     LINK                   GEDOUT
                                211
                                212 ********************************************************************
                                213 *    CHECK FOR BUSY & DELAY SUBROUTINE                             *
                                214 ********************************************************************
                                215
   0C31 34 08 0C58              216 BROUT   ST    BSEXIT+3,ARR           LOAD RETURN  ADDR.
   0C35 0C 02 0D3C 0CF1         217 SDC     MVC   BUSUB(3),BUSCTI        STORE DELAY COUNT
   0C3B 0F 02 0D3C 0CE2         218 FLOOP   SLC   BUSUB(3),ONE
   0C41 F2 81 07                219         JZ    TOLONG
   0C44 C1 E6 0C3B              220         TIO   FLOOP,BUSY
   0C48 F2 87 0A                221         J     BSEXIT
   0C4B C0 87 0222              222 TOLONG  B     HALT                   BUSY ERROR
   0C4F E011              0C50  223         DC    XL2'E011'
   0C51 C0 87 0C35              224         B     SDC
   0C55 C0 87 0000              225 BSEXIT  B     *-*
                                226 ********************************************************************
                                227 *    EXECUTE SIO SUBROUTINE                                        *
                                228 ********************************************************************
   0C59 31 E6 0CF6              229 XIO     LIO   LPDADR,LPDAR           LOAD DATA ADDR.REG.
   0C5D 36 08 0CE2              230 NEXIO   A     ONE,ARR
   0C61 34 08 0C97              231         ST    LDCMD+5,ARR            LOAD PARAMETER POINTER
   0C65 36 08 0CE2              232         A     ONE,ARR
   0C69 34 08 0CDA              233         ST    EXIT+3,ARR             SET UP EXIT
   0C6D 34 01 0CDC              234         ST    SAVWUN,XR1             SAVE REG. 1
   0C71 34 02 0CDE              235         ST    SAVTUU,XR2             SAVE REG.2
   0C75 C1 E0 0C7C              236 TIOCHK  TIO   ERNRDY,NRDY            BRANCH IF NOT READY
   0C79 F2 87 0A                237         J     TIOOK
   0C7C C0 87 0222              238 ERNRDY  B     HALT
   0C80 E010              0C81  239         DC    XL2'E010'              NOT READY ID.
   0C82 C0 87 0C75              240         B     TIOCHK
   0C86 C0 87 0C31              241 TIOOK   B     BPOUT
   0C8A 31 E0 0CEA              242         LIO   FOLG,LOFOLG
   0C8E 31 E4 0CE4              243         LIO   LPIADR,LPIAR           LOAD LSR ADDRESS REGISTER
   0C92 0C 01 0CAB 0000         244 LDCMD   MVC   CMND+2(2),*-*            SET UP COMMAND FROM PARAMETER
   0C98 38 80 0209              245         TBN   SBYTE1,SSW08           PRINT ON RIGHT CARR.
   0C9C F2 90 04                246         JF    NOTRIT
   0C9F 3A 08 0CAA              247         SBN   CMND+1,B'1000'         SET RIGHT CARR.MOD.BIT ON
   0CA3 0C 01 0D36 0CAB         248 NOTRIT  MVC   ERT1(2),CMND+2
   0CA9 F3 00 00                249 CMND    SIO   X'0',X'0'              COMMAND LOADED DURING EXECUTION
   0CAC C1 E6 0CB6              250         TIO   ISBUSY,BUSY
   0CB0 C0 87 0222              251         B     HALT                   IF NOT, HALT ON ERROR
   0CB4 E016              0CB5  252         DC    XL2'E016'              NOT BUSY HALT
   0CB6 35 02 0CE0              253 ISBUSY  L     ZERO,XR2
   0CBA C1 E2 0CC1              254 DELAY   TIO   BSYLP,PBBUSY           PRINT BUFF BUSY
   0CBE F2 87 0E                255         J     XIOEXT
   0CC1 36 02 0CE2              256 BSYLP   A     ONE,XR2                TRY FOR ABOUT 1.5 SECONDS TO
   0CC5 C0 01 0CBA              257         BNZ   DELAY                   CLEAR BUSY
   0CC9 C0 87 0222              258         B     HALT                   BUSY HALT
   0CCD E012              0CCE  259         DC    XL2'E012'
   0CCF 35 01 0CDC              260 XIOEXT  L     SAVWUN,XR1             RESTORE REG.1
   0CD3 35 02 0CDE              261         L     SAVTUU,XR2             RESTORE REG.2
   0CD7 C0 87 0000              262 EXIT    B     *-*                    EXIT SUBROUTINE
   0CDB 0000              0CDC  263 SAVWUN  DC    IL2'0'
   0CDD 0000              0CDE  264 SAVTUU  DC    IL2'0'
                                265
                                266 ********************************************************************
                                267 *    CONSTANTS                                                     *
                                268 ********************************************************************
   0CDF 0000              0CE0  269 ZERO    DC    IL2'0'
   0CE1 0001              0CE2  270 ONE     DC    IL2'1'
   0CE3 0800              0CE4  271 LPIADR  DC    XL2'800'               IMAGE ADDR.
   0CE5 087C              0CE6  272 LPDADR  DC    XL2'87C'               DATA ADDR.
   0CE7 0870              0CE8  273 WRDADR  DC    XL2'0870'
```

E043 5203 CYCLE STEAL & HAMMER ADDRESSING TESTS

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0CE9 7070             0CEA  274 FOLG   DC    XL2'7070'            FORM LENGTH 112
   0CEB E7E7E7E7         0CEE  275 EXES   DC    CL4'XXXX'
   0CEF 040000           0CF1  276 BUSCTI DC    XL3'40000'
                               277 ***************************************************************************
                               278 *       PRINTOUTS                                                         *
                               279 ***************************************************************************
   0CF2 C3E8C3D3C540E2E3 0D01  280 TITL1  DC    CL16'CYCLE STEAL TEST'
   0CFA C5C1D340E3C5E2E3       280
   0D02 C8C1D4D4C5D940C1 0D11  281 TITL2  DC    CL16'HAMMER ADDR.TEST'
   0D0A C4C4D94BE3C5E2E3       281
   0D12 D4C1D2C540F5F2F0 0D21  282        DC    CL16'MAKE 5203 READY,'
   0D1A F340D9C5C1C4E86B       282
   0D22 E3C8C5D540D9C5E2 0D30  283 MAKADY DC    CL15'THEN RESET HALT'
   0D2A C5E340C8C1D3E3         283
                               284 ***************************************************************************
                               285 *       RESERVED STORAGE                                                  *
                               286 ***************************************************************************
   0D31 0000             0D32  287 STAT2  DC    XL2'0'
   0D33 0000             0D34  288 STAT6  DC    XL2'0'
   0D35                  0D36  289 ERT1   DS    CL2
   0D37                  0D37  290 LPOUNT DS    CL1
   0D38                  0D39  291 MSECS  DS    CL2
   0D3A                  0D3C  292 BUSUB  DS    CL3
                               293 ***************************************************************************
                               294 *       EQUATES                                                           *
                               295 ***************************************************************************
                         FFE8  296 NEG24  EQU   -24
                         FFE2  297 NEG30  EQU   -30
                         FFDF  298 NEG33  EQU   -33
                         08FF  299 PRDAT  EQU   X'08FF'
                         0008  300 ARR    EQU   X'08'                 ADDRESS RECALL REGISTER
                         0001  301 XR1    EQU   1                     INDEX REGISTER 1
                         0002  302 XR2    EQU   2                     INDEX REGISTER 2
                         0800  303 LPI    EQU   X'800'                LINE PRINTER IMAGE AREA
                         087C  304 LPD    EQU   X'87C'                LINE PRINTER DATA AREA
                         00E0  305 LOFOLG EQU   X'E0'
                         00E4  306 LPIAR  EQU   X'E4'
                         00E6  307 LPDAR  EQU   X'E6'
                         0216  308 LINK   EQU   X'216'                ENTRY TO DCP CHAIN ROUTINE
                         0212  309 TEST   EQU   X'212'                ENTRY TO DCP READ DATA SW'S ROUT.
                         021A  310 PRINT  EQU   X'21A'                ENTRY TO DCP PRINT ROUTINE
                         0222  311 HALT   EQU   X'222'                ENTRY TO DCP ERROR HALT ROUTINE
                         00EC  312 NRDY   EQU   X'EC'
                         00E6  313 BUSY   EQU   X'E6'                PRINTER BUSY
                         00E2  314 PBBUSY EQU   X'E2'                BUFFER BUSY
                               315 *   SENSE SWITCH EQUATES
                         0208  316 SBYTE0 EQU   X'208'                DCP SENSE SWITCH AREA
                         0209  317 SBYTE1 EQU   X'209'                DCP SENSE SWITCH AREA
                               318 *   CONTROL PGM SENSE SWITCHES
                         0004  319 SSW05  EQU   X'04'                 PRINT MESSAGES ON MFCU
                         0080  320 SSW08  EQU   X'80'                 USE 5203 RIGHT CARR.
                               321        TREP
                               322 ********  SECTION E04  **************************  -NOTE-  ***********
                               323 **********
                               324        TREP
                               325 * ROUT.01 - CYCLE STEAL TEST          * BEFORE RUNNING THIS TEST,THE
                               326 *ALTERNATE*
                               327        TREP
                               328 * ROUT.02 - HAMMER ADDR. TEST         * PRINTER SHOULD BE READY, IF
                               329 * ALTERNATE*
                               330        TPEP
                               331 *                                     * PPINTER IS AVAILABLE, AND
                               332 *SSW-05 ON.*
                               333        TRPP
                               334 ***************************************************************************
                               335 **********
                               336        TREP
                               337 *
```


E043 5203 CYCLE STEAL & HAMMER ADDRESSING TESTS

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               338 *       *
                               339        TREP
                               340 *   THE C.E. SWITCH,TO OVERIDE IDLE CONTROL,MUST BE ON PRIOR TO RUNNING
                               341 *PROGRAM *
                               342        TREP
                               343 *
                               344 *       *
                               345        TREP
                               346 ***************************************************************************
                               347 **********
                         FFFF  348        END
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
APR	C	001	0008	0300	0155 0216 0230* 0231 0232* 0233
BAPRT	A	004	0A29	0038	0036
BROUT	A	004	0C31	0216	0241
BSEXIT	A	004	0C55	0225	0216* 0221
BSYLP	A	004	0CC1	0256	0254
BUSCTI	A	003	0CF1	0276	0217
BUSUB	A	003	0D3C	0292	0217* 0218*
BUSY	C	001	00E6	0313	0220 0250
CHHSL	A	004	0ABE	0086	0082
CHKHSL	A	004	0B66	0142	0138
CHKPC2	A	004	0B46	0132	0128
CHKPC3	A	004	0B56	0137	0133
CHPC2	A	004	0A9E	0076	0072
CHPC3	A	004	0AAE	0081	0077
CKHSL	A	004	0B12	0114	0110
CKPC2	A	004	0AF2	0104	0100
CKPC3	A	004	0B02	0109	0105
CMND	A	003	0CA9	0249	0244* 0247* 0248
DELAY	A	004	0CBA	0254	0257
ERNRDY	A	004	0C7C	0238	0236
ERT1	A	002	0D36	0289	0018 0248*
EXES	A	004	0CEE	0275	0201
EXIT	A	004	0CD7	0262	0233*
FLOOP	A	006	0C3B	0218	0220
FOLG	A	002	0CEA	0274	0242
FOPC2	A	004	0A7A	0065	0051* 0059*
FOUNIT	A	004	0C05	0200	0195 0198
GAWAN	A	006	0B73	0146	0069 0075 0080 0085 0090 0103 0108 0113 0118 0131 0136 0141 0143
GETIN	A	004	0A8A	0070	0066
GUDPF	A	004	0B22	0122	0115
HALT	C	001	0222	0311	0067 0073 0078 0083 0088 0101 0106 0111 0116 0129 0134 0139 0144 0222 0238 0251 0258
ISBUSY	A	004	0CB6	0253	0250
KZANGO	A	004	0A41	0050	0149
LANE	A	004	0BE7	0192	0163
LANEG	A	004	0BEB	0193	0209
LDCMD	A	006	0C92	0244	0231*
LINK	C	001	0216	0308	0150 0210
LOBLNK	A	004	0A66	0060	0056
LOFOLG	C	001	00E0	0305	0242*
LPD	C	001	087C	0304	0200
LPDADR	A	002	0CE6	0272	0229
LPDAR	C	001	00E6	0307	0050* 0229*
LPI	C	001	0800	0303	0160 0160 0161 0161
LPIADR	A	002	0CE4	0271	0243
LPIAR	C	001	00E4	0306	0243*
LPOUNT	A	001	0D37	0290	0046* 0146* 0148 0192* 0208*
MAKADY	A	015	0D30	0283	0043 0189
MEXIT	A	004	0BB3	0164	0155*
MHALT	A	003	0BE4	0191	0185
MITEG	A	004	0B8D	0156	0158
MRALT	A	003	0A3A	0045	0039
MSECS	A	002	0D39	0291	0159* 0162*
M4DEL	A	004	0B89	0155	0058
NEG24	C	001	FFE8	0296	0193
NEG30	C	001	FFE2	0297	0196
NEG33	C	001	FFDF	0298	0199
NEXIO	A	004	0C5D	0230	0062
NOTRIT	A	006	0CA3	0248	0246
NRDY	C	001	00E0	0312	0036 0182 0236
NPTIO	A	004	0A22	0036	0030
ONE	A	002	0CE2	0270	0146 0162 0206 0208 0218 0230 0232 0256
PSBUSY	C	001	00E2	0314	0254
PRDAT	C	001	08FF	0299	0060* 0061 0061* 0094* 0095 0095* 0122* 0123 0123*
PRINT	C	001	021A	0310	0031 0040 0177 0186

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RETIO	A	004	0BCC	0182	0176
RTN1	A	001	0ACD	0025	0017
RTN2	A	001	0BB7	0171	0027
SAVTUU	A	002	0CDE	0264	0235* 0261
SAVWUN	A	002	0CDC	0263	0234* 0260
SBYTE0	C	001	0208	0316	0029 0038 0175 0184
SBYTE1	C	001	0209	0317	0245
SDC	A	006	0C35	0217	0224
SPOUR	A	004	0A62	0059	0057
SPUDT	A	003	0A0C	0019	0052 0194 0197
SSW05	C	001	0004	0319	0029 0038 0175 0184
SSW08	C	001	0080	0320	0245
STAT2	A	002	0D32	0287	0054* 0055 0070* 0071 0076 0081 0086 0098* 0099 0104 0109 0114 0126* 0127 0132 0137 0142 0156* 0157
STAT6	A	002	0D34	0288	0064* 0065
SUNEPD	A	004	0A5E	0058	0053
TEST	C	001	0212	0309	0147 0204
TIOCHK	A	004	0C75	0236	0240
TIOOK	A	004	0C86	0241	0237
TITL1	A	016	0D01	0280	0034
TITL2	A	016	0D11	0281	0180
TOGOON	A	004	0A3D	0046	0037
TOLONG	A	004	0C4B	0222	0219
TRPAB	A	004	0BD3	0184	0182
UPCPF	A	004	0ACE	0094	0087
UVWXYZ	A	001	0A00	0004	
WAT	A	006	0B9D	0160	0163
WRDADR	A	002	0CE8	0273	0050
XIO	A	004	0C59	0229	0096 0124 0202
XIOEXT	A	004	0CCF	0260	0255
XR1	C	001	0001	0301	0200* 0201 0205 0205* 0234 0260*
XR2	C	001	0002	0302	0193* 0196* 0199* 0206* 0235 0253* 0256* 0261*
ZERO	A	002	0CE0	0269	0253
ZIPIT	A	005	0C09	0201	0207

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

THE CHARACTER ' INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

'GBK'GBD'''PN'25  89956'EC'572259'  PRINTER'CYCLE'ST  EAL'&'HMR'ADDR''  84@@84@@''''''''  ''''''''E0430000
T+-Y:8D<''&''5-4  ((>A&''D'B**8A'H  H@Z'H̄CH*BFUH&C&G  -'<G-BSX2/168A'H  H@Z'H̄OH*BFUD¬CLC  -8¬''Ē2<E0430001
T+-25¬'<@''47<;Q  <:C1"BX%9<'Y<@/'  +<+H(<T-BCLG2D'?  2/CL'/C>I|G0H̄;31  'B|@<-0T=B|"'/01  )8-D'NĒ8E0430002
T+-D̄0<+Q((C4'CLL  2-&X'/0HS8FG2/=U  08-42+A'(<?H&B*B  G'S.-Q?H̄G5LUHCL.  2D'X'/0HS8F|2/@H  9A'4'M-0E0430003
T+-,,<?H&B*BG'S.  -P|H̄G_LUBCL.2D'X  '/0HS8FP2/:M@"CT  "CH<H"-T"0H*<O;H  A<+H(<T-&CL.2D'X  '/0H'3$-E0430004
T+-%WH>AW@Y;A+'-  (<?H&B*BG'S.-P"H̄  G*LUDCL.2D'X'/0H  S8FT2/6D9'-42@/'  I0H*BH>AZ@Y)J|<-  H"00'09ME0430005
T+-_/-0T=B|"'/01  R8-D08-42+A'(<?H  &B*BG'S.-Ē?H̄G.L-  HCL.2D'X'/0HS8F3  2/148A'42@/'I0H*  BH>''M.<E0430006
T+->*$?H̄GCL-BCL.  2D'$'/0HS8F@+''4  7C+.'/0HK|J&((@B  BBUG'/0HO('-._IC  SCLH8'&420I'.TLO  YCLU¬,4E0430007
T+-?PC¬@H''-'CL%  H''-'CO'(+&3SOH&  .X*BG'''B'|""+'&  BB|H̄&B%BG'/2BD'4  J8'CA8'?L@Y*H+'&  BB|H':2UEC430008
T+-0KU','/0HĒ&J@  (<+C/@G0C|'<((@H  B"=-9A-Y<@/'|0-.  "8T-DE-32D'LB'?"  ¬0-DH¬40C''3>0H*  <O;H';IDE0430009
T+-1('*BG'/.K'&&  &'-3S)'D<B&@'CL*  <8%'AB=?'/0HO('-  <O'0BCL0<@&&@BCLO  <87H̄AA@GWCC?2/0,  '/0H'70@E0430010
T+-2HH>'J0H*<(*B  G'''19-3W(--<8T&  HCI*6B'3S;'-<6T&  AC(04'-3;0;'<¬|H̄  GB%BG'S.-D<BGCGP  '/00'4AHE0430011
T+-3C<LG-C+Y19'3  UC'D<D̄0''+H'BB¬H̄  &ACYHCH̄Y<'&46CH̄?  3''CA9-260H*BH>'  0(&H<8<GSC<G2/08  6'-0"BQF0430012
T+-3=8%'AC.,'/0H  S8AH5'&3*(&H<7%B  G''''''''''''''&-  'BG0H*GAC9=¬X90&  ''<|Y0'|E&+.T1*G  L&+<'13QE0430013
T(&441;.T2<GH5<P  R&<GD1(V.8@PS8'L  A4%N'¬.0@4CR1*G  D:F?T2<PN&(XE8%P  T&<TA4=<''''''''  '''''NĒUE0430014
********''SECTIO  N'E04''*********  **********''''''  **''-NOTE-''****  **********''''''  ''''''''  E0430015
*'ROUT.01'-'CYCL  E'STEAL'TEST''''  ''''''''*'BEFORE'  RUNNING'THIS'TES  T,THE'ALTERNATE*  ''''''''  E0430016
*'ROUT.02'-'HAMM  ER'ADDR.'TEST'''  ''''''''*'PRINTER  'SHOULD'BE'READY  ,'IF'ALTERNATE'*  ''''''''  E0430017
*''''''''''''''''  ''''''''''''''''  ''''''''*'PRINTER  'IS'AVAILABLE,'A  ND'SSW-05'ON.''*  ''''''''  E0430018
**********''''''  **********''''''  **********''''''  **********''''''  **********''''''  ''''''''  E0430019
*''''''''''''''''  ''''''''''''''''  ''''''''''''''''  ''''''''''''''''  ''''''''''''''''*  ''''''''  E0430020
```


OBJECT CARD LISTING

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

*'''THE'C.E.'SWI  TCH,TO'OVERIDE'I  DLE'CONTROL,MUST  'BE'ON'PRIOR'TO'  RUNNING'PROGRAM*  ''''''''  E0430021
*''''''''''''''''  ''''''''''''''''  ''''''''''''''''  ''''''''''''''''  ''''''''''''''''*  ''''''''  E0430022
**********''''''  **********''''''  **********''''''  **********''''''  **********''''''  ''''''''  E0430023
E"""*F7*=¬DC"PH$  ='7H&F|'''|'C''F%'''ASC'''F'A  SC'''Q''''''''''  '''''  09260630751  20575"$@EC430024
```

---------- LAST PAGE ----------

E055 DATA AND IMAGE ADDRESS REG. TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                2         DECK  4
   0A00                         3 UVWXYZ  START X'A00'
                                4 ********************************************************************************
                                5 *                              SECTION PREFACE                                 *
                                6 ********************************************************************************
                                7 *   THIS AREA CONTAINS INFORMATION NECESSARY FOR SECTION OPERATION.            *
                                8 *   THE PROGRAM IDENTIFICATION, FLAGS AND FIRST ROUTINE ADDRESS               *
                                9 *   ARE LOADED BY ASSEMBLED DATA. THE CURRENT ROUTINE NUMBER IS               *
                               10 *   SUPPLIED BY THE CONTROL PROGRAM.  SECTION UDT ENTRIES ARE                 *
                               11 *   DEFINED PARTIALLY BY THE SECTION SO THAT THE CONTROL PROGRAM              *
                               12 *   CAN SUPPLY OPTION BYTES.                                                  *
                               13 ********************************************************************************
   0A00 E055            0A01   14         DC    XL2'E055'          PROGRAM IDENTIFICATION
   0A02 00              0A02   15         DC    XL1'0'             FLAGS
   0A03 01              0A03   16         DC    XL1'1'             CURRENT ROUTINE NUMBER
   0A04 0000            0A05   17         DC    XL2'0'             RESERVED
   0A06 0A0D            0A07   18         DC    AL2(RTN1)          ADDRESS OF FIRST ROUTINE PREFIX
   0A08 15R5            0A09   19         DC    AL2(ERT1)          ADDRESS OF ERROR RECORDING TABLE
   0A0A E05000          0A0C   20 SPUDT  DC    XL3'E05000'        UNIT DEFINITION TABLE - PRINTER
                               21 ********************************************************************************
                               22 *
                               23 *       ROUTINE 1 - DATA ADDRESS INCREMENTING TEST                            *
                               24 *                                                                             *
                               25 ********************************************************************************
   0A0D 01              0A0D   26 RTN1   DC    XL1'1'             ROUTINE NUMBER
   0A0E 00              0A0E   27         DC    XL1'0'             FLAGS
   0A0F OFC9            0A10   28         DC    AL2(RTN2)          ADDRESS OF NEXT ROUTINE PREFIX
                               29 ********************************************************************************
   0A11 38 04 0208             30         TBN   SBYTE0,SSW05       PRINT ON MFCU
   0A15 F2 90 0A               31         JF    NRTIO
   0A18 C0 87 021A             32         B     PRINT              PRINT TITLE
   0A1C 42              0A1C   33         DC    XL1'42'
   0A1D 12              0A1D   34         DC    IL1'18'
   0A1E 1546            0A1F   35         DC    AL2(TITL1)
   0A20 E000            0A21   36         DC    XL2'E000'
   0A22 C1 E0 0A29             37 NRTIO  TIO   BAPRT,NRDY         PRINTER READY
   0A26 F2 87 14               38         J     TIPS
   0A29 38 04 0208             39 BAPRT  TBN   SBYTE0,SSW05       PRINT ON MFCU SW. ON
   0A2D F2 90 0A               40         JF    MRALT
   0A30 C0 87 021A             41         B     PRINT
   0A34 41              0A34   42         DC    XL1'41'
   0A35 22              0A35   43         DC    IL1'34'
   0A36 158D            0A37   44         DC    AL2(MAKADY)
   0A38 E0E1            0A39   45         DC    XL2'E0E1'
   0A3A F0 7C 03               46 MRALT  HPL   X'03',X'7C'         HALT E1
   0A3D 38 20 0A0C             47 TIPS   TBN   SPUDT,B'100000'    THISA 300 LPM PTR.?
   0A41 F2 90 18               48         JF    LOUNT
   0A44 3C 17 0D70             49         MVI   ININLI+1,X'17'
   0A48 3C 05 0D9D             50         MVI   INCONT+1,X'05'
   0A4C 3C 08 0DE7             51         MVI   BESSLI+1,X'08'
   0A50 3C 81 0E8A             52         MVI   M3XT+1,X'81'
   0A54 3C 81 0EEC             53         MVI   M2XT+1,X'81'
   0A58 3C 81 0F3A             54         MVI   M1XT+1,X'81'
                               55 ********************************************************************************
                               56 *    GET HAMMERS INTO PROPER POSITION
                               57 ********************************************************************************
   0A5C 31 E0 14BF             58 LOUNT  LIO   FOLG,LOFOLG
   0A60 31 E4 14B8             59         LIO   LPIADR,LPIAR       LOAD LSR ADDRESS REGISTER
   0A64 31 E6 14BD             60         LIO   LPDADR,LPDAR       LOAD DATA ADDR.REG.
   0A68 3C 0A 15B3             61         MVI   LPOUNT,X'0A'       LOAD LOOP COUNT OF 10
   0A6C 0C 02 15C1 14AB        62         MVC   BADM3(3),ZERO      ZERO ERR COUNTERS
   0A72 3B 08 0B59             63 TOGOON SBF   DACMD+1,B'1000'     SET MOD.BIT OFF
   0A76 3B 08 0F0D             64         SBF   DACMD1+1,B'1000'   SET MOD.BIT OFF
   0A7A 3B 08 0EA7             65         SBF   DACMD2+1,B'1000'   SET MOD.BIT OFF
   0A7E 3B 08 0E5D             66         SBF   DACMD3+1,B'1000'   SET MOD.BIT OFF
   0A82 38 80 0209             67         TBN   SBYTE1,SSW08       PRINT ON RIGHT CARR.
   0A86 F2 90 10               68         JF    MOVHAM
   0A89 3A 08 0B59             69         SBN   DACMD+1,B'1000'    SET MOD.BIT ON
```


E055 DATA AND IMAGE ADDRESS REG. TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0A8D 3A 08 0F0D             70         SBN   DACMD1+1,B'1000'   SET MOD.BIT ON
   0A91 3A 08 0EA7             71         SBN   DACMD2+1,B'1000'   SET MOD.BIT ON
   0A95 3A 08 0E5D             72         SBN   DACMD3+1,B'1000'   SET MOD.BIT ON
   0A99 3C 7F 0AEF             73 MOVHAM MVI   ZPRUNY+1,X'7F'
   0A9D 38 80 020C             74         TBN   SBYTE4,SSW20       OPTION 1 ON?
   0AA1 F2 10 06               75         JT    DUST
   0AA4 C0 87 1411             76         B     XIO                PRINT BLANKS
   0AA8 E200            0AA9   77         DC    XL2'E200'
   0AAA 39 30 0A0C             78 DUST   TBF   SPUDT,B'110000'    100 LPM PRINTER?
   0AAE F2 90 12               79         JF    SIOST
   0AB1 3C 7C 0AEF             80         MVI   ZPRUNY+1,X'7C'
   0AB5 38 80 020C             81         TBN   SBYTE4,SSW20       OPTION 1 ON
   0AB9 F2 10 23               82         JT    NEVES
   0ABC C0 87 0F9B             83         B     M4DEL              WAIT FOR M4 AND DELAY
   0AC0 F2 87 20               84         J     GRADAR
   0AC3 30 E2 15A9             85 SIOST  SNS   STAT2,X'E2'         SENSE THE TIMINGS
   0AC7 38 01 15A9             86         TBN   STAT2,B'1'         ARE HMRS.IN POS. 4
   0ACB F2 10 15               87         JT    GRADAR
   0ACE 38 80 020C             88         TBN   SBYTE4,SSW20       LPDAR OPTION 1 ON
   0AD2 F2 10 0A               89         JT    NEVES
   0AD5 C0 87 1411             90         B     XIO                PRINT A BLANK LINE
   0AD9 E200            0ADA   91         DC    XL2'E200'
   0ADB C0 87 0AC3             92         B     SIOST              GO CHK.AGAIN
   0ADF C0 87 0F63             93 NEVES  B     CRPAH              GO TO CHK.RESET SUBRT.
                               94 ********************************************************************************
                               95 *    CHECK     DATA ADDR.REG.FOR CORRECT INITIALIZING                          *
                               96 ********************************************************************************
   0AE3 38 80 020C             97 GRADAR TBN   SBYTE4,SSW20       LPDAR OPTION 1 ON
   0AE7 F2 10 15               98         JT    SAWRYT
   0AEA 30 E6 15AD             99         SNS   STAT6,X'E6'        SENSE DATA ADDR.
   0AEE 3D 00 15AD            100 ZPRUNY CLI   STAT6,*-*           LPDAR AT 7F OR 7C
   0AF2 F2 81 0A              101         JE    SAWRYT
   0AF5 C0 87 0222            102         B     HALT               DATA ADDR.DID NOT START
   0AF9 E070            0AFA  103         DC    XL2'E070'          AT 7F HALT
   0AFB C0 87 0A72            104         B     TOGOON
                              105 ********************************************************************************
                              106 *    GENERATE SENSE INSTRUCTIONS
                              107 ********************************************************************************
   0AFF 3C 00 14C5            108 SAWRYT MVI   STUU,X'00'         SET 2ND INDEXED SNS DISPL.TO 0
   0B03 3C 19 14C2            109         MVI   SWUN,X'19'         SET 1ST INDEXED SNS DISPL.TO 25
   0B07 C2 01 14C2            110         LA    SWUN,XR1           LOAD 1ST INDEXED SNS ADDR.
   0B0B C2 02 0B6B            111         LA    DARS1+2,XR2        LOAD START OF GENERATED FIELD
   0B0F 4E 00 00 14AF         112 ADTUU  ALC   0(1,XR1),TWO       ADD 2 TO 1ST INDEXED SNS DISPL.
   0B14 9C 02 00 00           113         MVC   0(3,XR2),0(,XR1)   PUT INDEXED SNS IN GENERATED FIELD
   0B18 36 02 14B1            114         A     TREE,XR2           UPDATE GEN.FIELD ADDR.BY 3
   0B1C 7D FF 00              115         CLI   0(,XR1),X'FF'      1ST INDEXED SNS DISPL.UP TO 255
   0B1F C0 82 0B0F            116         BL    ADTUU              IF NOT,GO DO ANOTHER
   0B23 C2 01 14C5            117         LA    STUU,XR1           LOAD 2ND INDEXED SNS ADDR.
   0B27 4E 00 00 14AF         118 ADTUTU ALC   0(1,XR1),TWO       ADD 2 TO 2ND INDEXED SNS DISPL.
   0B2C 9C 02 00 00           119         MVC   0(3,XR2),0(,XR1)   PUT INDEXED SNS IN GEN. FIELD
   0B30 36 02 14B1            120         A     TREE,XR2           UPDATE GEN.FIELD ADDR.BY 3
   0B34 7D 6E 00              121         CLI   0(,XR1),X'6E'      2ND INDEXED SNS DISPL.UP TO 110
   0B37 C0 82 0B27            122         BL    ADTUTU             IF NOT DO ANOTHER
                              123 ********************************************************************************
                              124 *    WAIT FOR HOME LATCH,THEN ISSUE PRINT&SPACE
                              125 ********************************************************************************
   0B3B C2 01 0B4F            126         LA    HMLOOP,XR1         LOAD 1 FOR A BASE
   0B3F C2 02 0C4E            127         LA    DARS2-1,XR2        LOAD 2 FOR A 2ND BASE
   0B43 30 E2 15A9            128 SAN    SNS   STAT2,X'E2'        GRAB TIMINGS
   0B47 38 10 15A8            129         TBN   STAT2-1,B'10000'   PSS-1 ON ?
   0B4B C0 90 0B43            130         BF    SAN
   0B4F 70 E2 10              131 HMLOOP SNS   16(,XR1),X'E2'      GRAB SENSE     SYNC ON HOME LATCH
   0B52 78 01 0F              132         TBN   15(,XR1),B'1'      HOME LATCH UP  18.24 USEC.LOOP
   0B55 D0 90 00              133         BF    0(,XR1)            LOOP IF NOT
   0B58 F3 E2 01              134 DACMD  SIO   X'01',X'E2'         PRINT AND SPACE
   0B5B F2 87 0B              135         J     DARS1              GO SAMPLE
   0B5E 0000            0B5F  136         DC    XL2'0'             SENSE AREA
   0B60 70 E2 10              137         SNS   16(,XR1),X'E2'
```

E055 DATA AND IMAGE ADDRESS REG. TEST

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0B63 78 00 10              138        TBN   16(,XR1),*-*          FILLER
   0B66 D0 10 11              139        BT    17(,XR1)
                              140 ********************************************************************
                              141 *    SAMPLE THE D.A.R. AT 7.62 USEC
                              142 ********************************************************************
                      0B69    143 DARS1  EQU   *
   0B69                       144        DS    CL230
                      0C4F    145 DARS2  EQU   *
   0C4F                       146        DS    CL110
   0CBD                       147        DS    CL170
                              148 ********************************************************************
                              149 *    CHECK HAMMER POSITION M4 INCREMENTING
                              150 ********************************************************************
   0D67 C2 02 0B6A            151        LA    DARS1+1,XR2
   0D6B C2 01 14CC            152        LA    M4PSS1,XR1            LOAD POS. 4 TABLE ADDR.
   0D6F 3C 21 15B0            153 ININLI MVI   SAMLIM,33             SET INIT.INCR. LIMIT (23 ON 300 LPM)
   0D73 3C 00 0D83            154 NEPSS  MVI   THCHEK+2,X'00'        SET INIT.DISPL.TO 0
   0D77 0E 00 0D83 14AD       155 DIPAD  ALC   THCHEK+2(1),ONE
   0D7D 36 02 14AF            156 SMAD   A     TWO,XR2
   0D81 6D 00 00 00           157 THCHEK CLC   0(1,XR1),0(,XR2)
   0D85 F2 81 14              158        JE    INCONT
   0D88 0F 00 15B0 14AD       159        SLC   SAMLIM(1),ONE
   0D8E C0 01 0D7D            160        BNZ   SMAD
   0D92 C0 87 0222            161        B     HALT                  D.A.R.DID NOT INCR. BY 12 HALT
   0D96 E071          0D97    162        DC    XL2'E071'
   0D98 C0 87 0A72            163        B     TOGOON
   0D9C 3C 08 15B0            164 INCONT MVI   SAMLIM,8              SET INCR. LIMIT (5 ON 300 LPM)
   0DA0 3D 0A 0D83            165        CLI   THCHEK+2,X'0A'         11 D.A.R. INCR.'S DONE
   0DA4 C0 82 0D77            166        BL    DIPAD
   0DA8 2C 01 15B2 00         167        MVC   LASAV(2),0(,XR2)       SAVE LAST PSS D.A.R.VALUE
   0DAD 3C 08 15B0            168        MVI   SAMLIM,X'08'           SET SAMPLE LIMLT TO 8
   0DB1 36 02 14AF            169 MALS   A     TWO,XR2
   0DB5 2D 01 15B2 00         170        CLC   LASAV(2),0(,XR2)       THIS BYTE LESS THAN LAST OF PSS
   0DBA F2 84 14              171        JH    CHESUB
   0DBD 0F 00 15B0 14AD       172        SLC   SAMLIM(1),ONE
   0DC3 C0 01 0DB1            173        BNZ   MALS
   0DC7 C0 87 0222            174        B     HALT                  D.A.R.DID NOT SUBTR. AFTER PSS
   0DCB E072          0DCC    175        DC    XL2'E072'
   0DCD C0 87 0A72            176        B     TOGOON
   0DD1 9D 01 00 0C           177 CHESUB CLC   0(2,XR2),12(,XR1)     NOW EQUAL TO NEXT INIT.INCR.
   0DD5 F2 81 0A              178        JE    SUBOK
   0DD8 C0 87 0222            179        B     HALT                  SUBTR. WRONG AFTER PSS
   0DDC E073          0DDD    180        DC    XL2'E073'             HALT
   0DDE C0 87 0A72            181        B     TOGOON
   0DE2 36 01 14B6            182 SUBOK  A     TWLVE,XR1             ADD FOR NEXT INIT.INCR.
   0DE6 3C 0D 15B0            183 BESSLI MVI   SAMLIM,13             SET BETWEEN PSS LIMIT (8 ON 300 LPM)
   0DEA 7D 7F 00              184        CLI   0(,XR1),X'7F'          ALL 3 PSS'S CHECKED
   0DED C0 01 0D73            185        BNE   NEPSS
   0DF1 35 02 14AB            186 EXLENT L     ZERO,XR2
   0DF5 C1 E6 0E00            187 AGAIN  TIO   YALED,BUSY            PRINTER STILL BUSY
   0DF9 C2 01 0E54            188        LA    GOM3,XR1              LOAD M3 START ADDRESS
   0DFD F2 87 12              189        J     STRIT
   0E00 36 02 14AD            190 YALED  A     ONE,XR2               WAIT FOR 1.5 SEC. TO
   0E04 C0 01 0DF5            191        BNZ   AGAIN                 CLEAR BUSY
   0E08 C0 87 0222            192        B     HALT                  BUSY TOO LONG HALT
   0E0C E014          0E0D    193        DC    XL2'E014'
   0E0E C0 87 0DF1            194        B     EXLENT
                              195 ********************************************************************
                              196 *    CHECK HAMMER POSITION M3 INITIAL INCREMENT
                              197 ********************************************************************
   0E12 34 01 0E3A            198 STRIT  ST    WHARTO+3,XR1
   0E16 39 30 0A0C            199        TBF   SPUDT,B'110000'         100 LPM PRINTER?
   0E1A F2 90 0F              200        JF    CLIHAP
   0E1D 38 80 020C            201        TBN   SBYTE4,SSW20            OPTION 1 ON
   0E21 F2 10 28              202        JT    BLAH
   0E24 C0 87 0F9B            203        B     M4DEL                   WAIT FOR M4 AND DELAY
   0E28 C0 87 0E37            204        B     WHARTO
   0E2C 30 E2 15A9            205 CLIHAP SNS   STAT2,X'E2'            SENSE TIMINGS
```


E055 DATA AND IMAGE ADDRESS REG. TEST

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E30 38 01 15A9            206        TBN   STAT2,B'1'            HAMMER IN M4
   0E34 F2 90 04              207        JF    OP1
   0E37 C0 87 0000            208 WHARTO B     *-*                   GO TO WHERE ?
   0E3B 38 80 020C            209 OP1    TBN   SBYTE4,SSW20          LPDAR OPTION 1 ON
   0E3F F2 10 0A              210        JT    BLAH
   0E42 C0 87 1411            211        B     XIO                   IF NOT MOVE 'EM
   0E46 E200          0E47    212        DC    XL2'E200'
   0E48 C0 87 0E2C            213        B     CLIHAP
   0E4C C0 87 0F63            214 BLAH   B     CRPAH                 GO TO CHK.RESET SUBRT:
   0E50 C0 87 0E37            215        B     WHARTO
   0E54 C2 02 0E5F            216 GOM3   LA    LUKPSE,XR2              LOAD LOOP ADDR.
   0E58 C2 01 158B            217        LA    M3DAR,XR1               LOAD SAMPLE AREA ADDR.
   0E5C F3 E2 01              218 DACMD3 SIO   X'01',X'E2'             DO A PRINT & SPACE
   0E5F 70 E2 00              219 LUKPSE SNS   0(,XR1),X'E2'           GET TIMINGS
   0E62 78 40 00              220        TBN   0(,XR1),B'1000000'      PRINT START EMITTER ON
   0E65 E0 90 00              221        BF    0(,XR2)                 IF NOT,LOOP
   0E68 70 E6 00              222        SNS   0(,XR1),X'E6'           GRAB DAR
   0E6B 7D 82 00              223        CLI   0(,XR1),X'82'           INIT.INCR.82 FOR M3
   0E6E F2 81 25              224        JE    GOAIT                   *
   0E71 0E 00 15C1 14AD       225        ALC   BADM3(1),ONE            ADD TO ERR COUNTER
   0E77 0D 00 15C1 14B2       226        CLC   BADM3(1),EIGHT          OVER 8 ERRS ?
   0E7D F2 81 0C              227        JE    TMM3E
   0E80 7D 8E 00              228        CLI   0(,XR1),X'8E'           HAS IT BEEN INCR. ONCE
   0E83 F2 81 10              229        JE    GOAIT                   *
   0E86 7D 9A 00              230        CLI   0(,XR1),X'9A'           THIS CHK.ON 300 LPM ONLY
   0E89 F2 07 0A              231 M3XT   JC    GOAIT,X'07'
   0E8C C0 87 0222            232 TMM3E  B     HALT                    M3 INIT.INCR.ERROR HALT
   0E90 E075          0E91    233        DC    XL2'E075'
   0E92 C0 87 0A72            234        B     TOGOON
   0E96 C1 E6 0E96            235 GOAIT  TIO   GOAIT,BUSY              WAIT TILL CMD.DONE
   0E9A C2 01 0EA2            236        LA    GOM2,XR1                LOAD M2 START ADDR.
   0E9E C0 87 0E12            237        B     STRIT
                              238 ********************************************************************
                              239 *    CHECK HAMMER POSITION M2 INITIAL INCREMENT
                              240 ********************************** *********************************
   0EA2 C2 01 15B9            241 GOM2   LA    M2DAR,XR1               LOAD SAMPLE AREA ADDR.
   0EA6 F3 E2 01              242 DACMD2 SIO   X'01',X'E2'             DO A PRINT AND SPACE
   0EA9 70 E2 00              243 LOKON  SNS   0(,XR1),X'E2'           GET TIMINGS
   0EAC 78 40 00              244        TBN   0(,XR1),B'1000000'      WAIT FOR PRINT START EMITTER ON
   0EAF C0 90 0EA9            245        BF    LOKON
   0EB3 70 E2 00              246 NOYET  SNS   0(,XR1),X'E2'           GET TIMINGS
   0EB6 79 40 00              247        TBF   0(,XR1),B'1000000'      WAIT FER PRINT START EMITTER OFF
   0EB9 C0 90 0EB3            248        BF    NOYET
   0EBD C2 02 0EC1            249        LA    FAST,XR2
   0EC1 70 E2 00              250 FAST   SNS   0(,XR1),X'E2'           GET TIMINGS
   0EC4 78 40 00              251        TBN   0(,XR1),B'1000000'      WAIT FER PRINT START EMITTER ON
   0EC7 E0 90 00              252        BF    0(,XR2)
   0ECA 70 E6 00              253        SNS   0(,XR1),X'E6'           GRAB DAR
   0ECD 7D 85 00              254        CLI   0(,XR1),X'85'           INIT.INCR. 85 FER M2
   0ED0 F2 81 25              255        JE    TWAIT
   0ED3 0E 00 15C0 14AD       256        ALC   BADM2(1),ONE             ADD TO ERR COUNTER
   0ED9 0D 00 15C0 14B2       257        CLC   BADM2(1),EIGHT           OVER 8 ERRS ?
   0EDF F2 81 0C              258        JE    TMM2E
   0EE2 7D 91 00              259        CLI   0(,XR1),X'91'           HAS IT BEEN INCR. ONCE ?
   0EE5 F2 81 10              260        JE    TWAIT                   *
   0EE8 7D 9D 00              261        CLI   0(,XR1),X'9D'           THIS CHK.ON 300 LPM ONLY
   0EEB F2 07 0A              262 M2XT   JC    TWAIT,X'07'
   0EEE C0 87 0222            263 TMM2E  B     HALT                    M2 INIT.INCR.ERROR HALT
   0EF2 E074          0EF3    264        DC    XL2'E074'
   0EF4 C0 87 0A72            265        B     TOGOON
   0EF8 C1 E6 0EF8            266 TWAIT  TIO   TWAIT,BUSY              WAIT TILL CMD.DONE
   0EFC C2 01 0F04            267        LA    GOM1,XR1                LOAD M1 START ADDR.
   0F00 C0 87 0E12            268        B     STRIT
                              269 ********************************************************************
                              270 *    CHECK HAMMER POSITION M1 INITIAL INCREMENT
                              271 ********************************************************************
   0F04 C2 02 0F0F            272 GOM1   LA    M1LOK,XR2               LOAD LOOP ADDR.
   0F08 C2 01 15B6            273        LA    M1DAR-1,XR1             LOAD SAMPLE AREA ADDR.
```

E055 DATA AND IMAGE ADDRESS REG. TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0F0C F3 E2 01                274 DACMD1 SIO   X'01',X'E2'          DO A  PRINT & SPACE
    0F0F 70 E2 01                275 M1LOK  SNS   1(,XR1),X'E2'       GET TIMINGS
    0F12 78 02 00                276        TBN   0(,XR1),B'10'       WAIT FER HAMMERS IN M1
    0F15 E0 90 00                277        BF    0(,XR2)
    0F18 70 E6 01                278        SNS   1(,XR1),X'E6'       GRAB DAR
    0F1B 7D 7C 01                279        CLI   1(,XR1),X'7C'       INIT.INCR.7C FER M1
    0F1E F2 81 25                280        JE    SUSY
    0F21 0E 00 15BF 14AD         281        ALC   BADM1(1),ONE        ADD TO ERR COUNTER
    0F27 0D 00 15BF 14B2         282        CLC   BADM1(1),EIGHT      OVER 8 ERRS ?
    0F2D F2 81 0C                283        JE    TMM1E
    0F30 7D 88 01                284        CLI   1(,XR1),X'88'       HAS IT BEEN INCR. ONCE
    0F33 F2 81 10                285        JE    SUSY                *
    0F36 7D 94 01                286        CLI   1(,XR1),X'94'       THIS CHK.ON 300 LPM ONLY
    0F39 F2 07 0A                287 M1XT   JC    SUSY,X'07'
    0F3C C0 87 0222              288 TMM1E  B     HALT                M1 INIT.INCR.ERROR HALT
    0F40 E079            0F41    289        DC    XL2'E079'
    0F42 C0 87 0A72              290        B     TOGOON
    0F46 C1 E6 0F46              291 SUSY   TIO   SUSY,BUSY            WAIT TILL CMD.DONE
    0F4A C0 87 0212              292        B     TEST
    0F4E 38 80 020C              293        TBN   SBYTE4,SSW20          OPTION 1 ON
    0F52 F2 10 0A                294        JT    LORIS
    0F55 0F 00 15B3 14AD         295        SLC   LPOUNT(1),ONE         ALL HMR.POS'S TRIED 10 TIMES
    0F5B C0 01 0AAA              296        BNZ   DUST
    0F5F C0 87 0216              297 LORIS  B     LINK
                                 298 ********************************************************************
                                 299 *    CHECK RESET PROMPTING AND HALT SUBROUTINE (LPDAR OPTION 1)
                                 300 ********************************************************************
    0F63 34 08 0F9A              301 CRPAH  ST    SEXIT+3,ARR           SET RETURN ADDR.
    0F67 38 04 0208              302        TBN   SBYTE0,SSW05          PRINT ON ALT.DEVICE
    0F6B F2 90 08                303        JF    ESVEN
    0F6E C0 87 021A              304        B     PRINT                 PRINT-CHECK RESET INSTR.
    0F72 01              0F72    305        DC    XL1'01'
    0F73 34              0F73    306        DC    IL1'52'
    0F74 158D            0F75    307        DC    AL2(MAKADY)
    0F76 F0 7C 07                308 ESVEN  HPL   X'07',X'7C'           CHECK RESET HALT
    0F79 C1 E6 0F79              309 NIPS   TIO   NIPS,BUSY             MUST BE NOT BUSY
    0F7D 3C 28 15AF              310        MVI   HAPOIN,X'28'          DELAY 40 MSEC COUNT
    0F81 0D FF 0800 0800         311 TAW    CLC   LPI(256),LPI          DELAY 1 MSEC
    0F87 0D 38 0800 0800         312        CLC   LPI(60),LPI
    0F8D 0F 00 15AF 14AD         313        SLC   HAPOIN(1),ONE         DECR.DELAY COUNT
    0F93 C0 84 0F81              314        BH    TAW
    0F97 C0 87 0000              315 SEXIT  B     *-*
                                 316 ********************************************************************
                                 317 *    WAIT FOR M4    THEN DELAY SUBROUTINE                        *
                                 318 ********************************************************************
    0F9B 34 08 0FC8              319 M4DEL  ST    MEXIT+3,ARR           SET RETURN
    0F9F 30 E2 15A9              320 GETIM  SNS   STAT2,X'E2'           GET TIMING
    0FA3 38 01 15A9              321        TBN   STAT2,B'1'            HAMMERS IN M4
    0FA7 C0 90 0F9F              322        BF    GETIM
    0FAB 3C 32 15AF              323        MVI   HAPOIN,X'32'          50 MSEC DELAY
    0FAF 0D FF 0800 0800         324 WAT    CLC   LPI(256),LPI          DELAY 1 MSEC
    0FB5 0D 38 0800 0800         325        CLC   LPI(60),LPI
    0FBB 0F 00 15AF 14AD         326        SLC   HAPOIN(1),ONE         DECR. DELAY COUNT
    0FC1 C0 84 0FAF              327        BH    WAT
    0FC5 C0 87 0000              328 MEXIT  B     *-*                   RETURN
                                 329
                                 330
                                 331
                                 332 ********************************************************************
                                 333 *                                                                  *
                                 334 *      ROUTINE 2 - IMAGE ADRRESS INCREMENTING TEST                 *
                                 335 *                                                                  *
                                 336 ********************************************************************
    0FC9 02              0FC9    337 RTN2   DC    XL1'2'                ROUTINE NUMBER
    0FCA 00              0FCA    338        DC    XL1'0'                FLAGS
    0FCB FFFF            0FCC    339        DC    XL2'FFFF'             LAST ROUTINE IN SECTION
                                 340 ********************************************************************
    0FCD 38 80 020C              341        TBN   SBYTE4,SSW20          DON'T CHK IMAGE IF OPTION 1 IS ON
```


E055 DATA AND IMAGE ADDRESS REG. TEST

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0FD1 C0 10 13E5              342        BT    BLINK
    0FD5 3D FF 0878              343        CLI   UCSFLG,X'FF'          UCSFLG SET
    0FD9 F2 01 04                344        JNE   SENAT
    0FDC 3C 39 0FE4              345        MVI   TECHBI,X'39'          SET TO CHK BIT OFF
    0FE0 30 E3 15AB              346 SENAT  SNS   STAT3,X'E3'           GRAB STATUS
    0FE4 38 04 15AB              347 TECHBI TBN   STAT3,B'100'          48 CHAR.BIT ON OR OFF
    0FE8 F2 10 17                348        JT    OKYDOK
    0FEB 38 04 0208              349        TBN   SBYTE0,SSW05          PRINT ON MFCU SW. ON
    0FEF F2 90 0A                350        JF    HALIT
    0FF2 C0 87 021A              351        B     PRINT                 PRINT CHAIN OR IMAGE ERR
    0FF6 C1              0FF6    352        DC    XL1'C1'
    0FF7 1A              0FF7    353        DC    XL1'26'
    0FF8 15A7            0FF9    354        DC    AL2(CHAERR)
    0FFA E00E            0FFB    355        DC    XL2'E00E'
    0FFC C0 87 0222              356 HALIT  B     HALT                  CHAIN CHK.HALT
    1000 E00E            1001    357        DC    XL2'E00E'
    1002 38 04 0208              358 OKYDOK TBN   SBYTE0,SSW05          PRINT ON MFCU
    1006 F2 90 0A                359        JF    RETIO
    1009 C0 87 021A              360        B     PRINT                 PRINT TITLE
    100D 42              100D    361        DC    XL1'42'
    100E 13              100E    362        DC    IL1'19'
    100F 1559            1010    363        DC    AL2(TITL2)
    1011 E000            1012    364        DC    XL2'E000'
    1013 C1 E0 101A              365 RETIO  TIO   TRPAB,NRDY             PRINTER READY
    1017 F2 87 36                366        J     TNUOL
    101A 38 04 0208              367 TRPAB  TBN   SBYTE0,SSW05          PRINT ON MFCU
    101E F2 90 0A                368        JF    MHALT
    1021 C0 87 021A              369        B     PRINT
    1025 41              1025    370        DC    XL1'41'
    1026 22              1026    371        DC    IL1'34'
    1027 158D            1028    372        DC    AL2(MAKADY)
    1029 E0E1            102A    373        DC    XL2'E0E1'
    102B F0 7C 03                374 MHALT  HPL   X'03',X'7C'            HALT E1
    102E 38 20 0A0C              375        TBN   SPUOT,B'100000'
    1032 F2 90 0F                376        JF    ERHTKS
    1035 3C 17 133D              377        MVI   INILI+1,X'17'
    1039 3C 05 1362              378        MVI   ICTAB+1,X'05'
    103D 3C 08 1392              379        MVI   BTSSLI+1,X'08'
    1041 F2 87 0C                380        J     TNUOL
    1044 3C 21 133D              381 ERHTKS MVI   INILI+1,X'21'
    1048 3C 08 1362              382        MVI   ICTAB+1,X'08'
    104C 3C 0D 1392              383        MVI   BTSSLI+1,X'0D'
                                 384 ********************************************************************
                                 385 *   GET HAMMERS INTO PROPER POSITION
                                 386 ********************************************************************
    1050 31 E0 14BF              387 TNUOL  LIO   FOLG,LOFOLG           LOAD FORMS LENGTH
    1054 31 E6 14BD              388        LIO   LPDADR,LPDAR           LOAD DATA ADDR. REG.
    1058 3C 0A 15B3              389        MVI   LPOUNT,X'0A'           LOAD LOOP COUNT OF 10
    105C 3B 08 10F6              390        SBF   IACMD+1,B'1000'        SET MOD.BIT OFF
    1060 38 80 0209              391        TBN   SBYTE1,SSW08           PRINT ON RIGHT CARR.
    1064 F2 90 04                392        JF    HERE
    1067 3A 08 10F6              393        SBN   IACMD+1,B'1000'        SET MOD.BIT ON
    106B C0 87 1411              394 HERE   B     XIO                    PRINT BLANKS
    106F E200            1070    395        DC    XL2'E200'
    1071 39 30 0A0C              396 SECIT  TBF   SPUOT,B'110000'        100 LPM PRINTER?
    1075 F2 90 07                397        JF    NOMOD
    1078 C0 87 0F9B              398        B     M4DEL                  WAIT FOR M4 AND DELAY
    107C F2 87 15                399        J     TYRWAS
    107F 30 E2 15A9              400 NOMOD  SNS   STAT2,X'E2'           SENSE THE TIMINGS
    1083 38 01 15A9              401        TBN   STAT2,B'1'            ARE HMRS.IN POS. 4
    1087 F2 10 0A                402        JT    TYRWAS
    108A C0 87 1411              403        B     XIO                    PRINT A BLANK LINE
    108E E200            108F    404        DC    XL2'E200'
    1090 C0 87 107F              405        B     NOMOD
                                 406 ********************************************************************
                                 407 *   GENERATE SENSE INSTRUCTIONS
                                 408 ********************************************************************
    1094 3C FE 14CB              409 TYRWAS MVI   ITUU,X'FE'             SET 2ND INDEXED SNS DISPL.TO 254
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1098 3C 10 14C8            410         MVI   IWUN,X'10'          SET 1ST INDEXED SNS DISPL.TO 16
   109C C2 01 14C8            411         LA    IWUN,XR1            LOAD 1ST INDEXED SNS ADDR.
   10A0 C2 02 10FF            412         LA    IARS1+2,XR2         LOAD START OF GENERATED FIELD
   10A4 4E 00 00 14AF         413 UUTDA   ALC   0(1,XR1),TWO        ADD 2 TO 1ST INDEXED SNS DISPL.
   10A9 9C 02 00 00           414         MVC   0(3,XR2),0(,XR1)    PUT INDEXED SNS IN GENERATED FIELD
   10AD 36 02 14B1            415         A     TREE,XR2            UPDATE GEN.FIELD ADDR.BY 3
   10B1 7D FE 00              416         CLI   0(,XR1),X'FE'       1ST INDEXED SNS DISPL.UP TO 254
   10B4 C0 82 10A4            417         BL    UUTDA
   10B8 C2 01 14CB            418         LA    ITUU,XR1            LOAD 2ND INDEXED SNS ADDR.
   10BC 4E 00 00 14AF         419 UTUTDA  ALC   0(1,XR1),TWO        ADD 2 TO 2ND INDEXED SNS DISPL.
   10C1 9C 02 00 00           420         MVC   0(3,XR2),0(,XR1)    PUT INDEXED SNS IN GEN. FIELD
   10C5 36 02 14B1            421         A     TREE,XR2            UPDATE GEN.FIELD ADDR.BY 3
   10C9 7D 78 00              422         CLI   0(,XR1),X'78'       2ND INDEXED SNS DISPL.UP TO 120
   10CC C0 82 10BC            423         BL    UTUTDA
                              424 ********************************************************************
                              425 *    WAIT FOR HOME LATCH,THEN ISSUE PRINT&SPACE
                              426 ********************************************************************
   10D0 31 F4 14BB            427         LIO   LPIADR,LPIAR        LOAD LSR ADDRESS REGISTER
   10D4 3C FF 087F            428         MVI   LPD+3,X'FF'         PUT UPC IN M4
   10D8 C2 01 10EC            429         LA    POOLMH,XR1          LOAD 1 FOR A BASE
   10DC C2 02 11EC            430         LA    IARS2+1,XR2         LOAD 2 FOR A 2ND BASE
   10E0 30 E2 15A9            431 NAS     SNS   STAT2,X'E2'         GRAB TIMINGS
   10E4 38 10 15A8            432         TBN   STAT2-1,B'10000'    PSS-1 ON ?
   10E8 C0 90 10E0            433         BF    NAS
   10EC 70 E2 10              434 POOLMH  SNS   16(,XR1),X'E2'       GRAB SENSE    SYNC ON HOME LATCH
   10EF 78 01 0F              435         TBN   15(,XR1),B'1'       HOME LATCH UP  18.24 USEC.LOOP
   10F2 D0 90 00              436         BF    0(,XR1)             LOOP IF NOT
   10F5 F3 E2 01              437 IACMD   SIO   X'01',X'E2'         PRINT AND SPACE
   10F8 D0 87 11              438         B     17(,XR1)            GO SAMPLE
   10FB 0000          10FC    439         DC    XL2'0'              SENSE AREA
                              440 ********************************************************************
                              441 *    SAMPLE THE I.A.R. AT 7.62 USEC
                              442 ********************************************************************
                      10FD    443 IARS1   EQU   *
   10FD               11EA    444         DS    CL238
                      11EB    445 IARS2   EQU   *
   11EB               1250    446         DS    CL102
   1251               1318    447         DS    CL200
   1319 3C 40 087F            448         MVI   LPD+3,X'40'         BLANK UPC
   131D 3C 28 13B8            449         MVI   DUNAL+1,X'28'       SET 48 CHAR.STOPPER
   1321 C2 01 14F0            450         LA    PS148-1,XR1
   1325 30 E3 15AB            451         SNS   STAT3,X'E3'         GRAB STATUS BYTES
   1329 38 04 15AB            452         TBN   STAT3,B'100'        48 CHAR.BIT ON
   132D F2 10 08              453         JT    SKUCS
   1330 C2 01 1512            454         LA    PS1UCS-1,XR1        MUST BE UCS
   1334 3C 58 13B8            455         MVI   DUNAL+1,X'58'       SET UCS STOPPER
   1338 C2 02 10FA            456 SKUCS   LA    IARS1-3,XR2
   133C 3C 00 15B0            457 INILI   MVI   SAMLIM,*-*          SET INIT. TO 33 OR 23
   1340 36 02 14AF            458 UPTWO   A     TWO,XR2
   1344 BD 02 02              459         CLI   2(,XR2),X'02'       INIT. INCR. 02 STILL
   1347 F2 81 13              460         JE    ITZRO
   134A 0F 00 15B0 14AD       461         SLC   SAMLIM(1),ONE       DECR. LIMIT
   1350 C0 01 1340            462         BNZ   UPTWO
   1354 C0 87 0222            463         B     HALT                I.A.R. DID NOT START
   1358 E076          1359    464         DC    XL2'E076'           AT 02 HALT
   135A F2 87 65              465         J     NUSAM
   135D 3C 00 1371            466 ITZRO   MVI   CHKINC+2,X'00'      SET INIT.DISPL.TO 0
   1361 3C 00 15B0            467 ICTAB   MVI   SAMLIM,*-*          SET INCR. LIMIT TO 8 OR 5
   1365 0E 00 1371 14AD       468         ALC   CHKINC+2(1),ONE     ADD TO DISPL.
   136B 36 02 14AF            469 ROGAN   A     TWO,XR2             ADD TO SAMPLE ADDR.
   136F 6D 00 00 00           470 CHKINC  CLC   0(1,XR1),0(,XR2)    SAMPLE EQUAL TO TABLE INCR.
   1373 F2 81 13              471         JE    ITSOK
   1376 0F 0C 15B0 14AD       472         SLC   SAMLIM(1),ONE       DECR.LIMIT
   137C C0 01 136B            473         BNZ   ROGAN
   1380 C0 87 0222            474         B     HALT                I.A.R.DID NOT INCR.
   1384 E077          1385    475         DC    XL2'E077'           BY 8 HALT
   1386 F2 87 39              476         J     NUSAM
   1389 3D 0B 1371            477 ITSOK   CLI   CHKINC+2,X'0B'       11 I.A R.INCR. DONE
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   138D C0 82 1361            478         BL    ICTAB
   1391 3C 00 15B0            479 BTSSLI  MVI   SAMLIM,*-*          SET BETWEEN PSS'S LIMIT TO 13 OR 8
   1395 36 01 14B4            480         A     LEVEN,XR1           ADD TABLE DISPL.TO TABLE ADDR.
   1399 36 02 14AF            481 NAGOR   A     TWO,XR2             ADD TO SAMPLE ADDR.
   139D 6D 00 01 00           482         CLC   1(1,XR1),0(,XR2)    SEARCH FOR NEXT INIT.INCR.
   13A1 F2 81 13              483         JE    DUNAL
   13A4 0F 00 15B0 14AD       484         SLC   SAMLIM(1),ONE       DECR.LIMIT
   13AA C0 01 1399            485         BNZ   NAGOR
   13AE C0 87 0222            486         B     HALT                PSS INIT.INCR.ERROR HALT
   13B2 E078          13B3    487         DC    XL2'E078'
   13B4 F2 87 0B              488         J     NUSAM
   13B7 7D 00 00              489 DUNAL   CLI   0(,XR1),*-*         ALL PSS'S CHACKED
   13BA C0 01 135D            490         BNE   ITZRO
   13BE C0 87 0212            491         B     TEST
   13C2 35 02 14AB            492 NUSAM   L     ZERO,XR2            WAIT TILL NOT BUSY
   13C6 C1 E6 13CD            493 BUTIO   TIO   BULOP,BUSY
   13CA F2 87 0E              494         J     SICEM
   13CD 36 02 14AD            495 BULOP   A     ONE,XR2
   13D1 C0 01 13C6            496         BNZ   BUTIO
   13D5 C0 87 0222            497         B     HALT
   13D9 E011          13DA    498         DC    XL2'E011'
   13DB 0F 00 15B3 14AD       499 SICEM   SLC   LPOUNT(1),ONE       GONE THRU 10 TIMES
   13E1 C0 01 1071            500         BNZ   SECIT
   13E5 C0 87 0216            501 BLINK   B     LINK
                              502 ********************************************************************
                              503 *    CHECK FOR BUSY & DELAY SUBROUTINE
                              504 ********************************************************************
   13E9 34 08 1410            505 BROUT   ST    BSEXIT+3,ARR
   13ED 0C 02 15BE 14B9       506 SDC     MVC   BUSUB(3),BUSCTI     STORE DELAY COUNT
   13F3 0F 02 15BE 14AD       507 FLOOP   SLC   BUSUB(3),ONE
   13F9 F2 81 07              508         JZ    TOLONG
   13FC C1 E6 13F3            509         TIO   FLOOP,BUSY
   1400 F2 87 0A              510         J     BSEXIT
   1403 C0 87 0222            511 TOLONG  B     HALT                ERROR HALT
   1407 E011          1408    512         DC    XL2'E011'           BUSY ID.
   1409 C0 87 13ED            513         B     SDC                 TRY AGAIN
   140D C0 87 0000            514 BSEXIT  B     *-*
                              515 ********************************************************************
                              516 *    EXECUTE SIO SUBROUTINE
                              517 ********************************************************************
   1411 36 08 14AD            518 XIO     A     ONE,ARR
   1415 34 08 1443            519         ST    LDCMD+9,ARR         LOAD PARAMETER POINTER
   1419 36 08 14AD            520         A     ONE,ARR
   141D 34 08 14A4            521         ST    EXIT+3,ARR          SET UP EXIT
   1421 34 01 14A6            522         ST    SAVWUN,XR1          SAVE REG. 1
   1425 34 02 14A8            523         ST    SAVTUU,XR2          SAVE REG.2
   1429 C1 E0 1430            524 TIOCHK  TIO   ERNRDY,NRDY         BRANCH IF NOT READY
   142D F2 87 0A              525         J     LDCMD
   1430 C0 87 0222            526 ERNRDY  B     HALT
   1434 E010          1435    527         DC    XL2'E010'           NOT READY ID.
   1436 C0 87 1429            528         B     TIOCHK
   143A C0 87 13E9            529 LDCMD   B     BROUT
   143E 0C 01 145B 0000       530         MVC   CMND+2(2),*-*       SET UP COMMAND FROM PARAMETER
   1444 3B 08 145A            531         SBF   CMND+1,B'1000'      SET MOD.BIT OFF
   1448 38 80 0209            532         TBN   SBYTE1,SSW08        PRINT ON RIGHT CARR.
   144C F2 90 04              533         JF    NOTRIT
   144F 3A 08 145A            534         SBN   CMND+1,B'1000'      SET RIGHT CARR.MOD.BIT ON
   1453 0C 01 15B5 145B       535 NOTRIT  MVC   ERT1(2),CMND+2
   1459 F3 00 00              536 CMND    SIO   X'0',X'0'           COMMAND LOADED DURING EXECUTION
   145C C1 E6 1466            537         TIO   ISBUSY,BUSY
   1460 C0 87 0222            538         B     HALT                IF NOT, HALT ON ERROR
   1464 E016          1465    539         DC    XL2'E016'           NOT BUSY HALT
   1466 35 02 14AB            540 ISBUSY  L     ZERO,XR2
   146A C1 E6 1471            541 DELAY   TIO   BSYLP,BUSY          PRINTER STILL BUSY
   146E F2 87 0E              542         J     XIOEXT
   1471 36 02 14AD            543 BSYLP   A     ONE,XR2             TRY FOR ABOUT 1.5 SECONDS TO
   1475 C0 01 146A            544         BNZ   DELAY                CLEAR BUSY
   1479 C0 87 0222            545         B     HALT                BUSY HALT
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E055 DATA AND IMAGE ADDRESS REG. TEST

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   147D E014             147E  546         DC    XL2'E014'
   147F 3C 80 15AF             547 XIOEXT MVI   HAPOIN,X'80'        LOAD DELAY COUNT OF 128
   1483 0D FF 0800 0800        548 WT     CLC   LPI(256),LPI        DELAY 1 MSEC.
   1489 0D 3B 0800 0800        549           CLC   LPI(60),LPI
   148F 0F 00 15AF 14AD        550           SLC   HAPOIN(I),ONE      DECREMENT DELAY COUNT
   1495 C0 84 1483             551           BH    WT
   1499 35 01 14A6             552           L     SAVWUN,XR1         RESTORE REG.1
   149D 35 02 14A8             553           L     SAVTUU,XR2         RESTORE REG.2
   14A1 C0 87 0000             554 EXIT      B     *-*                EXIT SUBROUTINE
                               555
   14A5 0000             14A6  556 SAVWUN DC    IL2'0'
   14A7 0000             14A8  557 SAVTUU DC    IL2'0'
                               558 ********************************************************************
                               559 *    CONSTANTS
                               560 ******* ***** ********************************************************
   14A9 00               14A9  561         DC    IL1'0'
   14AA 0000             14AB  562 ZERO    DC    IL2'0'
   14AC 0001             14AD  563 ONE     DC    IL2'1'
   14AE 0002             14AF  564 TWO     DC    IL2'2'
   14B0 0003             14B1  565 TREE    DC    IL2'3'
   14B2 08               14B2  566 EIGHT   DC    IL1'8'
   14B3 000B             14B4  567 LEVEN   DC    IL2'11'
   14B5 000C             14B6  568 TWLVE   DC    IL2'12'
   14B7 040000           14B9  569 BUSCTI  DC    XL3'40000'
   14BA 0800             14BB  570 LPIADR  DC    XL2'800'           IMAGE ADDR.
   14BC 087C             14BD  571 LPDADR  DC    XL2'87C'
   14BE 7070             14BF  572 FOLG    DC    XL2'7070'          FORM LENGTH 112
   14C0 70E619           14C2  573 SWUN    DC    XL3'70E619'
   14C3 B0E600           14C5  574 STUU    DC    XL3'B0E600'
   14C6 70E410           14C8  575 IWUN    DC    XL3'70E410'
   14C9 B0E4FE           14CB  576 ITUU    DC    XL3'B0E4FE'
                         14CC  577 M4PSS1  EQU   *
   14CC 7F8B97A3AFBBC7D3 14D3  578         DC    XL8'7F8B97A3AFBBC7D3' DAR VALUES FOR HMR.POS.4 PSS1
   14D4 DFEBF7           14D6  579         DC    XL3'DFEBF7'           132 PP
   14D7 08               14D7  580         DC    XL1'08'
   14D8 838F9BA7B3BFCBD7 14DF  581         DC    XL8'838F9BA7B3BFCBD7' DAR VALUES FOR HMR.POS.4 PSS2
   14E0 E3EFFB           14E2  582         DC    XL3'E3EFFB'           132 PP
   14E3 08               14E3  583         DC    XL1'08'
   14E4 87939FABB7C3CFDB 14EB  584         DC    XL8'87939FABB7C3CFDB' DAR VALUES FOR HMR.POS.4 PSS3
   14EC E7F3FF           14EE  585         DC    XL3'E7F3FF'           132 PP
   14EF 087F             14F0  586         DC    XL2'087F'
                               587
                         14F1  588 PS148   EQU   *
   14F1 020A121A222A020A 14FB  589         DC    XL11'020A121A222A020A121A22'  I.A.R.VALUES
   14F9 121A22                 589
   14FC 050D151D252D050D 1506  590         DC    XL11'050D151D252D050D151D25'   48 CHAR.SET
   1504 151D25                 590
   1507 0810182028000810 1511  591         DC    XL11'0810182028000810182028'
   150F 182028                 591
   1512 03               1512  592         DC    XL1'03'
                         1513  593 PS1UCS EQU   *
   1513 020A121A222A323A 151D  594         DC    XL11'020A121A222A323A424A52' I.A.R.VALUES
   151B 424A52                 594
   151E 050D151D252D353D 1528  595         DC    XL11'050D151D252D353D454D55'  U.C.S.
   1526 454D55                 595
   1529 0810182028303840 1533  596         DC    XL11'0810182028303840485058'
   1531 485058                 596
   1534 03               1534  597         DC    XL1'03'
                               598 ********************************************************************
                               599 *    MESSAGES
                               600 ********************************************************************
   1535 C4C1E3C140C1C4C4 1546  601 TITL1   DC    CL18'DATA ADDR.REG.TEST'
   153D D94BD9C5C74BE3C5       601
   1545 E2E3                   601
   1547 C9D4C1C7C540C1C4 1559  602 TITL2   DC    CL19'IMAGE ADDR.REG.TEST'
   154F C4D94BD9C5C74BE3       602
   1557 C5E2E3                 602
   155A D7D9C5E2E240C3C8 156B  603         DC    CL18'PRESS CHECK RESET,'
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E055 DATA AND IMAGE ADDRESS REG. TEST

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1562 C5C3D240D9C5E2C5       603
   156A E36B                   603
   156C F5F2F0F340D4E4E2 157E  604         DC    CL19'5203 MUST BE READY,'
   1574 E340C2C540D9C5C1       604
   157C C4E86B                 604
   157F E3C8C5D540D9C5E2 158D  605 MAKADY DC    CL15'THEN RESET HALT'
   1587 C5E340C8C1D3E3         605
   158E C9D4C1C7C5405040 159B  606         DC    CL14'IMAGE & CHAIN '
   1596 C3C8C1C9D540           606
   159C C4D640D5D6E340C1 15A7  607 CHAERR DC    CL12'DO NOT AGREE'
   15A4 C7D9C5C5               607
                               608 ********************************************************************
                               609 *    RESERVED STORAGE
                               610 ********************************************************************
   15A8 0000             15A9  611 STAT2   DC    XL2'0'
   15AA                  15AB  612 STAT3   DS    CL2
   15AC 0000             15AD  613 STAT6   DC    XL2'0'
   15AE 0000             15AF  614 HAPOIN  DC    XL2'0'
   15B0 00               15B0  615 SAMLIM  DC    XL1'0'
   15B1 0000             15B2  616 LASAV   DC    XL2'0'
   15B3                  15B3  617 LPOUNT  DS    CL1
   15B4                  15B5  618 ERT1    DS    CL2
   15B6 0000             15B7  619 M1DAR   DC    XL2'0'          M1 SAMPLE AREA
   15B8 0000             15B9  620 M2DAR   DC    XL2'0'          M2 SAMPLE AREA
   15BA 0000             15BB  621 M3DAR   DC    XL2'0'          M3 SAMPLE AREA
   15BC                  15BE  622 BUSUB   DS    CL3
   15BF                  15BF  623 BADM1   DS    CL1
   15C0                  15C0  624 BADM2   DS    CL1
   15C1                  15C1  625 BADM3   DS    CL1
                               626 ********************************************************************
                               627 *    EQUATES    *
                               628 ********************************************************************
   0008                629 ARR     EQU   X'08'           ADDRESS RECALL REGISTER
   0001                630 XR1     EQU   1               INDEX REGISTER 1
   0002                631 XR2     EQU   2               INDEX REGISTER 2
   0800                632 LPI     EQU   X'800'          LINE PRINTER IMAGE AREA
   087C                633 LPD     EQU   X'87C'          LINE PRINTER DATA AREA
   0878                634 UCSFLG  EQU   X'878'
   00E0                635 LOFOLG  EQU   X'E0'
   00E4                636 LPIAR   EQU   X'E4'
   00E6                637 LPDAR   EQU   X'E6'
   0216                638 LINK    EQU   X'216'          ENTRY TO DCP CHAIN ROUTINE
   0212                639 TEST    EQU   X'212'          ENTRY TO DCP READ DATA SW'S ROUT.
   021A                640 PRINT   EQU   X'21A'          ENTRY TO DCP PRINT ROUTINE
   0222                641 HALT    EQU   X'222'          ENTRY TO DCP ERROR HALT ROUTINE
   00E0                642 NRDY    EQU   X'E0'
   00E6                643 BUSY    EQU   X'E6'           PRINTER BUSY
                       644 *   SENSE SWITCH EQUATES.
   0208                645 SBYTE0  EQU   X'208'          DCP SENSE SWITCH AREA
   0209                646 SBYTE1  EQU   X'209'          DCP SENSE SWITCH AREA
   020C                647 SBYTE4  EQU   X'20C'          SECTION SENSE SWITCH AREA
                       648 *  CONTROL PGM SENSE SWITCHES
   0004                649 SSW05   EQU   X'04'           PRINT MESSAGES ON MFCU
   0080                650 SSW08   EQU   X'80'           USE 5203 RIGHT CARR.
                       651 *  SECTION SENSE SWITCHES.
   0080                652 SSW20   EQU   X'80'           LPDAR OPTION 1
   FFFF                653         END
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ADTUTU	A	005	0B27	0118	0122
ADTUU	A	005	0B0F	0112	0116
AGAIN	A	004	0DF5	0187	0191
ARR	C	001	0008	0629	0301 0319 0505 0518* 0519 0520* 0521
BADM1	A	001	15BF	0623	0281* 0282
BADM2	A	001	15C0	0624	0256* 0257
BADM3	A	001	15C1	0625	0062* 0225* 0226
BAPRT	A	004	0A29	0039	0037
BESSLI	A	004	0DE6	0183	0051*
BLAH	A	004	0E4C	0214	0202 0210
BLINK	A	004	13E5	0501	0342
BROUT	A	004	13E9	0505	0529
BSEXIT	A	004	140D	0514	0505* 0510
BSYLP	A	004	1471	0543	0541
BTSSLI	A	004	1391	0479	0379* 0383*
BULOP	A	004	13CD	0495	0493
BUSCTI	A	003	14B9	0569	0506
BUSUB	A	003	15BE	0622	0506* 0507*
BUSY	C	001	00E6	0643	0187 0235 0266 0291 0309 0493 0509 0537 0541
BUTIO	A	004	13C6	0493	0496
CHAERR	A	012	15A7	0607	0354
CHESUB	A	004	0DD1	0177	0171
CHKINC	A	004	136F	0470	0466* 0468* 0477
CLIHAP	A	004	0E2C	0205	0200 0213
CMND	A	003	1459	0536	0530* 0531* 0534* 0535
CRPAH	A	004	0F63	0301	0093 0214
DACMD	A	003	0B58	0134	0063* 0069*
DACMD1	A	003	0F0C	0274	0064* 0070*
DACMD2	A	003	0EA6	0242	0065* 0071*
DACMD3	A	003	0E5C	0218	0066* 0072*
DARS1	A	001	0B69	0143	0111 0135 0151
DARS2	A	001	0C4F	0145	0127
DELAY	A	004	146A	0541	0544
DIPAD	A	006	0D77	0155	0166
DUNAL	A	003	13B7	0489	0449* 0455* 0483
DUST	A	004	0AAA	0078	0075 0296
EIGHT	A	001	14B2	0566	0226 0257 0282
ERHTKS	A	004	1044	0381	0376
ERNRDY	A	004	1430	0526	0524
ERT1	A	002	15B5	0618	0019 0535*
ESVEN	A	003	0F76	0308	0303
EXIT	A	004	14A1	0554	0521*
EXLENT	A	004	0DF1	0186	0194
FAST	A	003	0EC1	0250	0249
FLOOP	A	006	13F3	0507	0509
FOLG	A	002	14BF	0572	0058 0387
GETIM	A	004	0F9F	0320	0322
GOAIT	A	004	0E96	0235	0224 0229 0231 0235
GOM1	A	004	0F04	0272	0267
GOM2	A	004	0EA2	0241	0236
GOM3	A	004	0E54	0216	0188
GRADAR	A	004	0AE3	0097	0084 0087
HALIT	A	004	0FFC	0356	0350
HALT	C	001	0222	0641	0102 0161 0174 0179 0192 0232 0263 0288 0356 0463 0474 0486 0497 0511 0526 0538 0545
HAPOIN	A	002	15AF	0614	0310* 0313* 0323* 0326* 0547* 0550*
HERE	A	004	106B	0394	0392
HMLOOP	A	003	0B4F	0131	0126
IACMD	A	003	10F5	0437	0390* 0393*
IARS1	A	001	10FD	0443	0412 0456
IARS2	A	001	11EB	0445	0430
ICTAB	A	004	1361	0467	0378* 0382* 0478
INCONT	A	004	0D9C	0164	0050* 0158
INILI	A	004	133C	0457	0377* 0381*
ININLI	A	004	0D6F	0153	0049*
ISBUSY	A	004	1466	0540	0537

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ITSOK	A	004	1389	0477	0471
ITUU	A	003	14CB	0576	0409* 0418
ITZRO	A	004	135D	0466	0460 0490
IWUN	A	003	14C8	0575	0410* 0411
LASAV	A	002	15B2	0616	0167* 0170
LDCMD	A	004	143A	0529	0519* 0525
LEVEN	A	002	14B4	0567	0480
LINK	C	001	0216	0638	0297 0501
LOFOLG	C	001	00E0	0635	0058* 0387*
LOKON	A	003	0EA9	0243	0245
LORIS	A	004	0F5F	0297	0294
LOUNT	A	004	0A5C	0058	0048
LPD	C	001	087C	0633	0428* 0448*
LPDADR	A	002	14BD	0571	0060 0388
LPDAR	C	001	00E6	0637	0060* 0388*
LPI	C	001	0800	0632	0311 0311 0312 0312 0324 0324 0325 0325 0548 0548 0549 0549
LPIADR	A	002	14BB	0570	0059 0427
LPIAR	C	001	00E4	0636	0059* 0427*
LPOUNT	A	001	15B3	0617	0061* 0295* 0389* 0499*
LUKPSE	A	003	0E5F	0219	0216
MAKADY	A	015	158D	0605	0044 0307 0372
MALS	A	004	0DB1	0169	0173
MEXIT	A	004	0FC5	0328	0319*
MHALT	A	003	102B	0374	0368
MOVHAM	A	004	0A99	0073	0068
MRALT	A	003	0A3A	0046	0040
M1DAR	A	002	15B7	0619	0273
M1LOK	A	003	0F0F	0275	0272
M1XT	A	003	0F39	0287	0054*
M2DAR	A	002	15B9	0620	0241
M2XT	A	003	0EEB	0262	0053*
M3DAR	A	002	15BB	0621	0217
M3XT	A	003	0E89	0231	0052*
M4DEL	A	004	0F9B	0319	0083 0203 0398
M4PSS1	A	001	14CC	0577	0152
NAGOR	A	004	1399	0481	0485
NAS	A	004	10E0	0431	0433
NEPSS	A	004	0D73	0154	0185
NEVES	A	004	0ADF	0093	0082 0089
NIPS	A	004	0F79	0309	0309
NOMOD	A	004	107F	0400	0397 0405
NOTRIT	A	006	1453	0535	0533
NOYET	A	003	0EB3	0246	0248
NRDY	C	001	00E0	0642	0037 0365 0524
NRTIO	A	004	0A22	0037	0031
NUSAM	A	004	13C2	0492	0465 0476 0488
OKYDOK	A	004	1002	0358	0348
ONE	A	002	14AD	0563	0155 0159 0172 0190 0225 0256 0281 0295 0313 0326 0461 0468 0472 0484 0495 0499 0507 0518 0520 0543 0550
OP1	A	004	0E3B	0209	0207
POOLMH	A	003	10EC	0434	0429
PRINT	C	001	021A	0640	0032 0041 0304 0351 0360 0369
PS1UCS	A	001	1513	0593	0454
PS148	A	001	14F1	0588	0450
RETIO	A	004	1013	0365	0359
ROGAN	A	004	136B	0469	0473
RTN1	A	001	0A0D	0026	0018
RTN2	A	001	0FC9	0337	0028
SAMLIM	A	001	15B0	0615	0153* 0159* 0164* 0168* 0172* 0183* 0457* 0461* 0467* 0472* 0479* 0484*
SAN	A	004	0B43	0128	0130
SAVTUU	A	002	14A8	0557	0523* 0553
SAVWUN	A	002	14A6	0556	0522* 0552
SAWRYT	A	004	0AFF	0108	0098 0101
SBYTE0	C	001	0208	0645	0030 0039 0302 0349 0358 0367
SBYTE1	C	001	0209	0646	0067 0391 0532
SBYTE4	C	001	020C	0647	0074 0081 0088 0097 0201 0209 0293 0341

E055 DATA AND IMAGE ADDRESS REG. TEST

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SDC	A	006	13ED	0506	0515
SECIT	A	004	1071	0396	0500
SENAT	A	004	0FEC	0346	0344
SEXIT	A	004	0F97	0315	0301*
SICEM	A	006	13DB	0499	0494
SIOST	A	004	0AC3	0085	0079 0092
SKUCS	A	004	133E	0456	0453
SMAD	A	004	0D7D	0156	0160
SPUDT	A	003	0A0C	0020	0047 0078 0199 0375 0396
SSW05	C	001	0004	0049	0030 0039 0302 0349 0358 0367
SSW08	C	001	0080	0650	0067 0391 0532
SSW20	C	001	0080	0652	0074 0081 0088 0097 0201 0209 0293 0341
STAT2	A	002	15A9	0611	0085* 0086 0128* 0129 0205* 0206 0320* 0321 0400* 0401 0431* 0432
STAT3	A	002	15AB	0612	0346* 0347 0451* 0452
STAT6	A	002	15AD	0613	0099* 0100
STRIT	A	004	0E12	0198	0189 0237 0268
STUU	A	003	14C5	0574	0108* 0117
SUBOK	A	004	0DE2	0182	0178
SUSY	A	004	0F46	0291	0280 0285 0287 0291
SWUN	A	003	14C2	0573	0109* 0110
TAW	A	006	0FE1	0311	0314
TECHBI	A	004	0FE4	0347	0345*
TEST	C	001	0212	0639	0292 0491
THCHEK	A	004	0D81	0157	0154* 0155* 0165
TIOCHK	A	004	1429	0524	0528
TIPS	A	004	0A3D	0047	0038
TITL1	A	018	1546	0601	0035
TITL2	A	019	1559	0602	0363
TMM1E	A	004	0F3C	0288	0283
TMM2E	A	004	0EEE	0263	0258
TMM3E	A	004	0E8C	0232	0227
TNUOL	A	004	1050	0387	0366 0380
TOGGON	A	004	0A72	0063	0104 0163 0176 0181 0234 0265 0290
TOLONG	A	004	1403	0511	0508
TREE	A	002	14B1	0565	0114 0120 0415 0421
TRPAB	A	004	101A	0367	0365
TWAIT	A	004	0EF8	0266	0255 0260 0262 0266
TWLVE	A	002	14B6	0568	0182
TWO	A	002	14AF	0564	0112 0118 0156 0169 0413 0419 0458 0469 0481
TYRWAS	A	004	1094	0409	0399 0402
UCSFLG	C	001	0878	0634	0343
UPTWO	A	004	1340	0458	0462
UTUTDA	A	005	10BC	0419	0423
UUTDA	A	005	10A4	0413	0417
UVWXYZ	A	001	0A00	0003	
WAT	A	006	0FAF	0324	0327
WHARTO	A	004	0E37	0208	0198* 0204 0215
WT	A	006	1483	0548	0551
XIO	A	004	1411	0518	0076 0090 0211 0394 0403
XIOEXT	A	004	147F	0547	0542
XR1	C	001	0001	0630	0110* 0112 0113 0115 0117* 0118 0119 0121 0126* 0131 0132 0133
					0137 0138 0139 0152* 0157 0177 0182* 0184 0188* 0198 0217* 0219
					0220 0222 0223 0228 0230 0236* 0241* 0243 0244 0246 0247 0250
					0251 0253 0254 0259 0261 0267* 0273* 0275 0276 0278 0279 0284
					0286 0411* 0413 0414 0416 0418* 0419 0420 0422 0429* 0434 0435
					0436 0438 0450* 0454* 0470 0480* 0482 0489 0522 0552*
XR2	C	001	0002	0631	0111* 0113 0114* 0119 0120* 0127* 0151* 0156* 0157 0167 0169* 0170
					0177 0186* 0190* 0216* 0221 0249* 0252 0272* 0277 0412* 0414 0415*
					0420 0421* 0430* 0456* 0458* 0459 0469* 0470 0481* 0482 0492* 0495*
					0523 0540* 0543* 0553*
YALED	A	004	0E00	0190	0187
ZERO	A	002	14AB	0562	0062 0186 0492 0540
ZPRUNY	A	004	CAEE	0100	0073* 0080*

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

E055 DATA AND IMAGE ADDRESS REG. TEST

OBJECT CARD LISTING

THE CHARACTER ' INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-Y:8EM''&''B-4	N_;A&''D'C@U8A'H	H@Z'H̄OH*BFUHKEM$	-'<G-BSX2/1&8A'H	H@Z'H̄OH*BFUDSEQ7	-8¬''}LOE0550001
T+-Z5¬'<8H'Y<@Z'	Q!A*(*COECR4@B'7	X!HD+ST2AC>0@-&@	:<;'M?3GUE.%19/K	'!'YN%OOBE*DMD̄3%	HB5U'LK'E0550002
T+-D0+0-!CL%HCD̄*	#B'9)+H'BB-H̄&DCY	HB5U:B'@'+--+Z3Y	HCV4@¬J,?+H'BC!H	&A%BGE@GS'CUOB-3	2UAH'*18E0550003
T+-,,!GOH̄#3S''-3	2DB!'/O=$@Y*-<+H	NDL-AEĒX2DAM8-'H	<@/'H̄OH*MD;H'OH*	H̄O@BGC6<8-'H<@/'	N<+Q'Ē KQE0550004
T+-%WEĒ4'AO_@YD	H̄OH*BH>AOOH*H̄*TO	'E<M@FJLBO-DMD%H	B86_+'''M,90B'''	6'/K1¬¬@'OHH.C@H	AE<M'#C*E0550005
T+-_/L-''EH̄=*'-'	'(-HM%P5>'<BBB2¬	B'&_!O-H<LTCSEĒU	8DAOYOI'.&7CSDG-	AC'B&'!S'¬H̄GBO'	'*+H'=Ē-E0550006
TA-_YDG-'D('&D&	'''''''''''''''''	'''''''''''''''''	'''''''''''''''''	'''''''''''''''''	'''''4&YE0550007
T+-6/O-H.Ē%HAE<O	@HJOO!''(-08'CQ<	M,LQBEH̄*_''''@YD	MCO'N%AK_O'D(¬*B	G'S.-**BGBXH@BAO	O!&Y'&S*E0550008
T+-7*CQ!'--57.'D	N%-'@BAOO(-HM,24	AE$H'@Y&MCO'N%AK	_O'D(%*BG'S.-*%B	GBXH̄)'&'<@YDH̄O+*	BH>''#-QE0550009
T+-8P*@BGBXH6'JK	6!'4N%G5"'<'ACP<	5'/K,O;Q+'<HACVL	2/1H6'/K_O'D(**B	G'S.-E<BGC¬D4'&8	:+L''$C*E0550010
T+-9KB-32U'@8-'H	<@/'YOH*!W@BGCT*	08/OZ+'DN D̄-H̄&A<B	G'''8-'H<@/'H̄OH*	MD;H'OH*+.<BGC6!	'/O8'#:'E0550011
T+-:!(@HBCV"B'JC	#@=HA**H';D''8I'	'**O'¬QH'@YDVC-	NOJK_C& NOJK2@YD	<¬Q8'@YD&¬RY'@-*	H̄OH*'=24E0550012
T+-#H'S.-)*BGBX.	A9-:OO-D+Y%BGC/.	B'JO9@=HA**H';D'	'OI'+D̄PCS'GV''<B	&C,!B'-#A**H';D'	'8I'':ZHE0550013
T+-@C'GCW'G6E'!H̄	AI&8'E*'M,&4'E*'	M%?H̄ACG6J'!H̄ADG6	)'!HGB%RG'S.-)<B	GBX.A9-#8O-D!A<B	GC/H'QĒHE0550014
T+-@=O-H!C@HAE$$	38-EO8-E8'-C-U'A	09-E!¬'G2-KM+'AO	"EH4('AO"E..2-&1	'S'G2-JA'V'G2AO,	'/OH'&D̄HE0550015
T+-!9H>A9OH*H̄*%G	WC4$'/OHK+H'BC!H	&8-@'E$<M,*'AB D̄,	'/OHO('-!WT-D'-T	2U'T'/OHĒ'L&NT¬A	@A@D'6,*E0550016
T+-=49-!9!B-N,07	"B''H''4"B''H''@	'EĒ@M,*BDC8G'/O'	'('-!2CCSEĒU8'JC	ZOI'!X3O2EĒ@("O-	8'''!Z'E0550017
T+-"?CL%H'-'CO'	N,1K_OH&!,@BG'''	B'!"'+H'BC<'&D=M	'"O/8@-DD!CU!9CC	TEĒ%8AAU,@/'P+'&	8B!H 58<E0550018
T+/'DU',/OHĒOJY	NZ='+OH*BH>'++'&	B8!H̄&B%BG'/ZBO1N	R8'CA8A'Ē@Y*6+'&	88!H̄&B%BG'/ZAH/O	(8+D'6SDE0550019
T+/AV@GOC+B'H̄C!H̄	&C3OPD34@AJ(S!'-	LU?H̄GCCO/D34@9A(	S!'4LUTG-E.@19/K	'!'YN%3%HD!Q8-'H	I@Z''9BQE0550020
T+/B-ACYHD!$'/1&	J8-'9<'Y<@Z'GOH*	!W"H̄GFLCSEĒU8'JO	Z@/'H̄OH*MD;H'OH*	&¬33=E<%@DALHO-D	M2<H'R,HL0550021

E055 DATA AND IMAGE ADDRESS REG. TEST

OBJECT CARD LISTING

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

T+/C$ /C"L-  EH=  * -  (-HM%P7= <B  BDHLB JL.L-  EH=  * -  (-HM%P58 <B  BD.019AK#||@H¬@H  AD+0 N& E0550022
THAC@O-HJ#CCSEEU  8DAOYOI &8GCSDG-  AC'B& ||S )BGD&                                        19UE0550023
T+/(L|D H¬30YD#T  B JLO<+<ND3-DEE?  2D TB JMK|E-L><H  BD|Y@ AOO(-HM,#4  B ?HADO@ E$ M,*  AD4 J-8E0550024
T+/++OH*BH>A6@Y)  V|  L*LO E$ + A(  1EH46 /K?$&  |H  ADO@ E$ M,* AD6?  /OHS8G¬2/3U" B1(  1OHH PROE0550025
T+/|ID6D@ AOO(-D  M_CQBEH'_  D @YD  LCO N%AK_O DLW*B  G S.-;|HGB74  <  AD57 /OHK(&HMD@G  WD@4 $1 E0550026
T+/&D@Y*+(-HM,*  AD@$ /OHS8AD| AO  3EH7  JA1OH*BET&  HEA < /O=E.U| /O  =EH72-&¬A9/|3@Y*  HOH* ;/*E0550027
T+/&" S.-D*BGD=7  /O  (--M,L&HED<  6BAK_( -MZC&AEHQ  4 /KYO; M<|HGB%B  G S.-D<BGEBX /1|  ZC D @S-E0550028
T+/J:EE%  C%HEEY  8- HI@Z D+--MO-O  AE$MMO"<  <GWEF$  /OHS8AQ5 /K,O;Q  M*¬HGCTQBEH7  JJ  DOH* 2 &E0550029
T+/K5 S.-EC2 EE@  ("O- B  (+O- B  | AO?EH7 /AKC(&D  MZTMBEHT /O                A H O-  BO EH<E0550030
T+/LOC &  - BG1  O*GCWF$CW GCUD.C  U"X=.V:+?>@¬L7=?  7BH+|W:;3?@?P8="  #BH;LX:>7O@"$9"|  "BG@ $2ME0550031
T+/M, -YKFSHD -Y  KFSHECJM)IK4EGJM  )I&-&FB Y  -&FB  Y OHHD/YSHTH:&UZ  KA&4NGKM_(L5ELNM  HDA- #Y%E0550032
T+/NWH8-O+DAHME-  C1<GTOMCA1<LRK'X  E14?T1;.T2)LA1@N  O*LD6M?R1*).8@P  S8'¬R1;.S&<|H1*|  K&(U @&0E0550033
T+/O/1;.E86?5@?C  3&(LU8>( O%N 6*P  A1+/,8@TE5MCR1;.  E84CHO)|T2)LA1@N  MDCC2<GI5MCD5UC  N5>< J2&E0550034
TA1OZ&<GG6*PE                                                                  6DDE0550035
TA/O2                                                                          &1&E0550036
TAJO#                                                                          ;/ME0550037
E""!*E7*=¬DC"PH$  ="7M&F|  |  C  F%  ASC  R A  SO  Q  02350317710  60571@#*E0550038
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LAST PAGE

DATE	31OCT69	22DEC69	20JAN70	02MAR70	11MAY70	01NOV70	04JUN71	PROG ID	0E05-5
EC NO.	816529	816547	816548	816631	816671	816764	818969	PAGE	8

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                  2        DECK  4
    0A00                          3 E06    START X'A00'
                                  4 ***************************************************************
                                  5 *                                                             *
                                  6 *      SYSTEM/3 52C3 CHAIN EMITTER TIMING TEST                *
                                  7 *                                                             *
                                  8 ***************************************************************
                                  9 *      SECTION 6 - ROUTINE 1                                  *
                                 10 ***************************************************************
    0A00 E063              0A01  11        DC    XL2'E063'           PROG IDENTIFICATICN
    0A02 00                0A02  12        DC    XL1'0'              FLAGS
    0A03 01                0A03  13        DC    XL1'1'              CURRENT ROUTINE NUMBER
    0A04 0000              0A05  14        DC    XL2'0'              RESERVED
    0A06 0A0D              0A07  15        DC    AL2(RTN1)           ADDRESS OF FIRST ROUTINE PREFIX
    0A08 0C99              0A09  16        DC    AL2(ERT1)           ADDRESS OF ERROR RECORDING TABLE
    0A0A E05000            0A0C  17 SPUDT  DC    XL3'E05000'         UNIT DEFINITICN TABLE - PRINTER
                                 18 ***************************************************************
                                 19 *                                                             *
                                 20 *      ROUTINE 1 - CHAIN EMITTER TIMING TEST                  *
                                 21 *                                                             *
                                 22 ***************************************************************
    0A0D 01                0A0D  23 RTN1   DC    XL1'1'              RCUTINE NUMBER
    0A0E 00                0A0E  24        DC    XL1'0'              FLAGS
    0A0F FFFF              0A10  25        DC    XL2'FFFF'           LAST ROUTINE
                                 26 ***************************************************************
    0A11 38 04 0208              27        TBN   SBYTEC,SSW05        PRINT CN MFCU
    0A15 F2 10 0A                28        JT    NRTIO
    0A18 C0 87 021A              29        B     PRINT               PRINT TITLE
    0A1C 42                0A1C  30        DC    XL1'42'
    0A1D 19                0A1D  31        DC    IL1'25'
    0A1E 0C76              0A1F  32        DC    AL2(TITL1)
    0A20 E000              0A21  33        DC    XL2'E000'
    0A22 C1 E0 0A29              34 NRTIO  TIO   BAPRT,NRDY          PRINTER READY
    0A26 F2 87 14                35        J     NOOGOT
    0A29 38 04 0208              36 BAPRT  TBN   SBYTEO,SSW05        PRINT ON MFCU SW. ON
    0A2D F2 90 0A                37        JF    MRALT
    0A30 C0 87 021A              38        B     PRINT               PRINT MAKE PRINTER READY
    0A34 41                0A34  39        DC    XL1'41'
    0A35 1F                0A35  40        DC    IL1'31'
    0A36 0C95              0A37  41        DC    AL2(MAKADY)
    0A38 E0E1              0A39  42        DC    XL2'E0E1'
    0A3A F0 7C 03                43 MRALT  HPL   X'03',X'7C'         HALT E1
    0A3D 3C 0A 0C9A              44 NOOGOT MVI   LPOUNT,10
    0A41 38 20 0A0C              45        TBN   SPUDT,B'100000'     100-200 LPM ?
    0A45 F2 90 1A                46        JF    SNOTRE
    0A48 3C 1C 0B2E              47        MVI   CEMAX+1,X'1C'
    0A4C 3C 19 0AFA              48        MVI   ITNAM+1,X'19'
    0A50 3C 19 0B8D              49        MVI   MANTI+1,X'19'
    0A54 3C 08 0B6E              50        MVI   HMMIN+1,X'08'
    0A58 3C 0F 0B75              51        MVI   HMMAX+1,X'0F'
    0A5C 0C 01 0B45 0C5A         52        MVC   GOBAK+3(2),ADFRTY
                                 53 ***************************************************************
                                 54 *    GENERATE THE SENSE INSTRUCTICNS                          *
                                 55 ***************************************************************
    0A62 3C 04 0CA0              56 SNOTRE MVI   MSECS,X'04'         SET 4 MSEC DELAY 1ST TIME THRU
    0A66 3C 08 0C9B              57        MVI   TOUNT,8
    0A6A F2 87 C6                58        J     TOGOON
    0A6D 0E 00 0CA0 0C46         59 SKGOON ALC   MSECS(1),NINE       ADD 9 TO MSEC DELAY
    0A73 0C 01 0C4E 0C52         60 TOGOON MVC   STUU(2),SAMADR      LOAD STARTING SENSE ADDR.
    0A79 C2 01 0C4E              61        LA    STUU,XR1            LOAD SENSE INSTR.ADDR.
    0A7D C2 02 0EC3              62        LA    SENIN+3,XR2         LOAD GEN.FIELD ADDR.
    0A81 9C 03 00 00             63 ADTUU  MVC   0(4,XR2),0(,XR1)    PUT SENSE INSTR.  IN GEN.FIELD
    0A85 4E 01 00 0C40           64        ALC   0(2,XR1),ONE        ADD 1 TO SENSE INSTR. ADDR.
    0A8A 35 02 0C44              65        A     FOUR,XR2            UP GEN.FIELD ADDR.BY 4
    0A8E 4D 01 00 0C50           66        CLC   0(2,XR1),LASADR     1100 SENSE INSTR.GENERATED?
    0A93 C0 01 0A81              67        BNE   ADTUU
    0A97 0C 03 1FF3 0C56         68        MVC   SAMRET(4),BRUNC     PUT IN UNC BR
    0A9D C0 87 0C17              69.       B     BROUT
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                 70 ***************************************************************
                                 71 *    FIND HCME LATCH,THEN SAMPLE AT 9.12 USEC FOR 10 MSEC     *
                                 72 ***************************************************************
    0AA1 30 E2 0C97              73 SNIK   SNS   STAT2,X'E2'         GRAB THE TIMINGS
    0AA5 38 01 0C96              74        TBN   STAT2-1,B'1'        HCME LATCH ON?
    0AA9 C0 90 0AA1              75        BF    SNIK
    0AAD 0C 00 0CA2 0CA0         76        MVC   HCMCNT(1),MSECS     SET UP DELAY COUNT
    0AB3 0D FF 0800 0800         77 TWA    CLC   LPI(256),LPI        1 MSEC
    0AB9 0D 3B 0800 0800         78        CLC   LPI(60),LPI         DELAY
    0ABF 0F 00 0CA2 0C40         79        SLC   HCMCNT(1),CNE       DECR.DELAY COUNT
    0AC5 C0 84 0AB3              80        BH    TWA
    0AC9 C0 87 0EC0              81        B     SENIN               GO SAMPLE 1100 BYTES AT 9.12
    0ACD 3C 30 130C              82 RETURN MVI   HCMIN+1,X'30'       WIPE HI ADDR. BYTE
                                 83 ***************************************************************
                                 84 *    CHECK TIMING BETWEEN CHAIN EMITTER PULSES                *
                                 85 ***************************************************************
    0AD1 C2 01 0EC0              86        LA    SENIN,XR1           LCAD ADDR. OF 1ST SAMPLE
    0AD5 78 20 00                87 FIBIOF TBN   0(,XR1),B'100000'   FIND CHAIN EMITTER OFF
    0AD8 F2 90 08                88        JF    ENIF
    0ADB 36 01 0C40              89        A     ONE,XR1
    0ADF C0 87 0AD5              90        B     FIBIOF
    0AE3 36 01 0C40              91 ENIF   A     ONE,XR1             LOOK FOR RISE CF CHAIN EMIT.
    0AE7 78 20 00                92        TBN   0(,XR1),B'100000'
    0AEA C0 90 0AE3              93        BF    ENIF
    0AEE 78 C1 00                94        TBN   0(,XR1),B'1'        HOME LATCH ON
    0AF1 C0 10 0AD5              95        BT    FIBIOF              SKIP THIS EMITTER
    0AF5 3C 00 0CA3              96 NEXEM  MVI   SAMCNT,X'C0'        ZERO EMITTER SAMPLE CNT.
    0AF9 3C 28 0B99              97 ITNAM  MVI   NTHCM+1,40          SET MIN AT 365 USEC
    0AFD 36 01 0C40              98 LKGAN  A     ONE,XR1
    0B01 7D 30 02                99        CLI   2(,XR1),X'30'       1100 SAMPLES CHECKED
    0B04 F2 81 9F               100        JE    TSAL
    0B07 0E 00 0CA3 0C40        101        ALC   SAMCNT(1),ONE
    0B0D 78 20 00               102        TBN   0(,XR1),B'100000'   CHAIN EMITTER STILL UP
    0B10 F2 90 04               103        JF    FIRISE
    0B13 C0 87 0AFD             104        B     LKGAN
    0B17 36 01 0C40             105 FIRISE A     CNE,XR1
    0B1B 7D 30 02               106        CLI   2(,XR1),X'30'        1100 SAMPLES CHECKED?
    0B1E F2 81 85               107        JE    TSAL
    0B21 0E 00 0CA3 0C40        108        ALC   SAMCNT(1),CNE
    0B27 79 20 00               109        TBF   0(,XR1),B'100000'   IF CHAIN EMIT.DOWN,FIND NEXT RISE
    0B2A F2 90 08               110        JF    ITSUP
    0B2D 3D 2D 0CA3             111 CEMAX  CLI   SAMCNT,45           MORE THAN 410 USEC 'TWEEN EMITS.
    0B31 F2 84 6C               112        JH    TOMNY
    0B34 C0 87 0B17             113        B     FIRISE
    0B38 78 C1 01               114 ITSUP  TBN   1(,XR1),B'1'        IS THIS A HOME PULSE
    0B3B F2 90 5A               115        JF    NTHCM               *
    0B3E 34 01 0CA6             116        ST    SAVF1,XR1
                                117 ***************************************************************
                                118 *      CHECK PULSE WIDTHS & HOME PULSE TIME                   *
                                119 * *************************************************************
    0B42 36 C1 CC4A             120 GCBAK  A     SISFR,XR1           SUBTR.120 OR 72 FROM HOME ADDR.
    0B46 36 01 0C40             121 GORK   A     ONE,XR1
    0B4A 79 20 00               122        TBF   0(,XR1),B'100000'   FIND GAP
    0B4D C0 90 0B46             123        BF    GCRK
    0B51 C0 87 0BBE             124        B     LULSE               GC CHECK 142ND EMITTER WIDTH
    0B55 C0 87 0BBE             125        B     LULSE               GO CHECK 143RD EMITTER WIDTH
    0B59 C0 87 0BBE             126        B     LULSE               GC CHECK 144TH EMITTER WIDTH
    0B5D 0C 01 0C9F 0C9D        127        MVC   LEEAST(2),LEEADR    SAVE 144TH ADDR.
    0B63 C0 87 0BBE             128        B     LULSE               GO CHECK 145TH EMITTER WIDTH
    0B67 0F 01 0C9D 0C9F        129        SLC   LEEADR(2),LEEAST    DIFF.'TWEEN 144TH AND 145TH
    0B6D 3D 10 0C9D             130 HMMIN  CLI   LEEADR,16           SAMPLE DIFF.LESS THAN 16 OR 8
    0B71 F2 82 07               131        JL    HOMER
    0B74 3D 1B 0C9D             132 HMMAX  CLI   LEEADR,27           SAMPLE DIFF.MCRE THAN 27 OR 15
    0B78 F2 04 09               133        JNH   SEEWUN
    0B7B C0 87 0222             134 HOMER  B     HALT                HCME TIME ERROR HALT
    0B7F E082              0B80 135        DC    XL2'E082'
    0B81 F2 87 2C               136        J     GNIP
    0B84 C0 87 0BBE             137 SEEWUN B     LULSE
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   0B88 C0 87 0BBE            138         B     LULSE
   0B8C 3C 27 0B99            139 MANTI   MVI   NTHOM+1,39          SET MIN AT 356 FOR LAST EMIT.
   0B90 35 01 0CA6            140         L     SAVR1,XR1
   0B94 C0 87 0AFD            141         B     LKGAN
   0B98 3D 02 0CA3            142 NTHOM   CLI   SAMCNT,*-*          LESS THAN 365 USEC 'TWEEN EMITTERS
   0B9C C0 02 0AF5            143         BNL   NEXEM
   0BA0 C0 87 0222            144 TOMNY   B     HALT                EMITTER TIMING WRONG HALT
   0BA4 E080          0BA5    145         DC    XL2'E080'
   0BA6 0F 00 0C9B 0C40       146 TSAL    SLC   TCUNT(1),ONE        DONE  8 TIMES
   0BAC C0 01 0A6D            147         BNZ   SKGOON
   0BB0 0F 00 0C9A 0C40       148 GNIP    SLC   LPCUNT(1),ONE       DONE 10 TIMES
   0BB6 C0 01 0A62            149         BNZ   SNOTRE
   0BBA C0 87 0216            150         B     LINK
                              151 ********************************************************************************
                              152 *    CHECK PULSE WIDTH SUBROUTINE
                              153 ********************************************************************************
   0BBE 34 08 0C16            154 LULSE   ST    PLEXIT+3,ARR        SET RETURN ADDR.
   0BC2 36 01 0C40            155 LEEG    A     ONE,XR1
   0BC6 78 20 00              156         TBN   0(,XR1),B'100000'   FIND LEAD EDGE OF EMITTER
   0BC9 C0 90 0BC2            157         BF    LEEG
   0BCD 34 01 0C9D            158         ST    LEEADR,XR1          SAVE LEADING EDGE ADDR.
   0BD1 3C 00 0CA4            159         MVI   SAMSAV,X'00'        ZERO SAM.COUNT
   0BD5 0E 00 0CA4 0C40       160 TREG    ALC   SAMSAV(1),ONE       ADD 1 TO SAM.COUNT
   0BDB 36 01 0C40            161         A     ONE,XR1             ADD 1 TO SAM.ADDR.
   0BDF 78 20 00              162         TBN   0(,XR1),B'100000'   FIND TRAIL EDGE OF EMITTER
   0BE2 C0 10 0BD5            163         BT    TREG
   0BE6 3D 02 0CA4            164 PUMIN   CLI   SAMSAV,2            PULSE WIDTH 2 OR MORE
   0BEA F2 82 1C              165         JL    WIDER
   0BED 3C 00 0CA4            166         MVI   SAMSAV,X'00'
   0BF1 0F 00 0CA4 0C40       167 SNAP    ALC   SAMSAV(1),ONE
   0BF7 36 01 0C40            168         A     ONE,XR1
   0BFB 3D 01 0CA4            169 GAPWID  CLI   SAMSAV,1             GAP WIDTH OVER 1 ?
   0BFF F2 84 11              170         JH    PLEXIT
   0C02 78 20 00              171         TBN   0(,XR1),B'100000'
   0C05 C0 90 0BF1            172         BF    SNAP
   0C09 C0 87 0222            173 WIDER   B     HALT                WRONG PULSE WIDTH ERROR HALT
   0C0D E081          0C0E    174         DC    XL2'E081'
   0C0F C0 87 0BB0            175         B     GNIP
   0C13 C0 87 0000            176 PLEXIT  B     *-*                 RETURN
                              177
                              178 ********************************************************************************
                              179 *      CHECK FOR BUSY & DELAY SUBROUTINE                                       *
                              180 ********************************************************************************
   0C17 34 08 0C3E            181 BROUT   ST    BSEXIT+3,ARR        LOAD RETURN ADDR.
   0C1B 0C 02 1FF6 0C5D       182 SDC     MVC   BUSUB(3),BUSCTI     STOREDELAY
   0C21 0F 02 1FF6 0C40       183 FLOOP   SLC   BUSUB(3),ONE
   0C27 F2 81 07              184         JZ    TOLONG
   0C2A C1 E6 0C21            185         TIO   FLOOP,BUSY          STILL BUSY
   0C2E F2 87 0A              186         J     BSEXIT
   0C31 C0 87 0222            187 TOLONG  B     HALT                ERROR HALT
   0C35 EC11          0C36    188         DC    XL2'EC11'
   0C37 C0 87 0C1B            189         B     SDC
   0C3B C0 87 0000            190 BSEXIT  B     *-*
                              191 ********************************************************************************
                              192 *      CONSTANTS                                                               *
                              193 ********************************************************************************
   0C3F 0001          0C40    194 ONE     DC    IL2'1'
   0C41 0003          0C42    195 TREE    DC    IL2'3'
   0C43 0004          0C44    196 FOUR    DC    IL2'4'
   0C45 0009          0C46    197 NINE    DC    IL2'9'
   0C47 FFB8          0C48    198 FRTY    DC    IL2'-72'            NEG.72
   0C49 FF88          0C4A    199 SISFR   DC    IL2'-120'           NEG 120
   0C4B 30E2          0C4C    200         DC    XL2'30E2'
   0C4D 0EC1          0C4E    201 STUU    DC    XL2'0EC1'           SENSE INSTR.
   0C4F 130D          0C50    202 LASADR  DC    AL2(HCMIN+2)
   0C51 0EC1          0C52    203 SAMADR  DC    AL2(SENIN+1)
   0C53 C087          0C54    204         DC    XL2'C087'           UNCOND. BR
   0C55 0ACD          0C56    205 BRUNC   DC    AL2(RETURN)
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   0C57 0CFF          0C58    206 00FF    DC    XL2'00FF'                    AFTER SAMPLE
   0C59 0C48          0C5A    207 ADFRTY  DC    AL2(FRTY)
   0C5B 040000        0C5D    208 BUSCTI  DC    XL3'40000'
                              209 ********************************************************************************
                              210 *      PRINTOUTS                                                               *
                              211 ********************************************************************************
   0C5E C3C8C1C9D540C5D4 0C76 212 TITL1   DC    CL25'CHAIN EMITTER TIMING TEST'
   0C66 C9E3E3C5D940E3C9      212
   0C6E D4C9D5C740E3C5E2      212
   0C76 E3                    212
   0C77 D4C1D2C540F5F2F0 0C86 213         DC    CL16'MAKE 5203 READY,'
   0C7F F340D9C5C1C4E86B      213
   0C87 E3C8C5D540D9C5E2 0C95 214 MAKADY  DC    CL15'THEN RESET HALT'
   0C8F C5E340C8C1D3E3        214
                              215 ********************************************************************************
                              216 *      RESERVED STORAGE                                                        *
                              217 ********************************************************************************
   0C96                 0C97  218 STAT2   DS    CL2
   0C98                 0C99  219 ERT1    DS    CL2
   0C9A                 0C9A  220 LPCUNT  DS    CL1
   0C9B                 0C9B  221 TCUNT   DS    CL1
   0C9C                 0C9D  222 LEEADR  DS    CL2
   0C9E                 0C9F  223 LEEAST  DS    CL2
   0CA0                 0CA0  224 MSECS   DS    CL1
   0CA1                 0CA2  225 HOMCNT  DS    CL2
   0CA3                 0CA3  226 SAMCNT  DS    CL1
   0CA4                 0CA4  227 SAMSAV  DS    CL1
   0CA5                 0CA6  228 SAVR1   DS    CL2
   0EC0                       229         ORG   X'0EC0'
   0EC0                 0EC0  230 SENIN   EQU   *
   0EC0                 130B  231 HOMIN   DS    11CL100                SAMPLE AREA
   130C                 1C07  232 NTMOH   DS    23CL100                SAMPLE AREA
   1C08                 1DFB  233 DIMES   DS    5CL100                 SAMPLE AREA
   1DFC                 1FEF  234 SEMID   DS    5CL100                 SAMPLE AREA
   1FF0                 1FF1  235 ZROFF   DS    CL2
   1FF2                 1FF3  236 SAMRET  DS    CL2
   1FF4                 1FF6  237 BUSUB   DS    CL3
                              238 ********************************************************************************
                              239 *      EQUATES                                                                 *
                              240 ********************************************************************************
   0008                       241 ARR     EQU   X'08'                  ADDRESS RECALL REGISTER
   0001                       242 XR1     EQU   1                      INDEX REGISTER 1
   0002                       243 XR2     EQU   2                      INDEX REGISTER 2
   0800                       244 LPI     EQU   X'800'                 LINE PRINTER IMAGE AREA
   0216                       245 LINK    EQU   X'216'                 ENTRY TO DCP CHAIN ROUTINE
   021A                       246 PRINT   EQU   X'21A'                 ENTRY TO DCP PRINT ROUTINE
   0222                       247 HALT    EQU   X'222'                 ENTRY TO DCP ERROR HALT ROUTINE
   00E0                       248 NRDY    EQU   X'E0'
   00E6                       249 BUSY    EQU   X'E6'                  PRINTER  BUSY CODE
                              250 *   SENSE SWITCH EQUATES
   0208                       251 SBYTE0  EQU   X'208'                 DCP SENSE SWITCH AREA
                              252 *   CONTROL PGM SENSE SWITCHES
   0004                       253 SSW05   EQU   X'04'                  PRINT MESSAGES ON MFCU
   FFFF                       254         END
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ADFRTY	A	002	0C5A	0207	0052
ADTUU	A	004	0A81	0063	0067
ARR	C	001	0008	0241	0154 0181
BAPRT	A	004	0A29	0036	0034
BROUT	A	004	0C17	0181	0069
BRUNC	A	002	0C56	0205	0068
BSEXIT	A	004	0C3B	0190	0181* 0186
BUSCTI	A	003	0C3D	0208	0182
BUSUB	A	003	1FF6	0237	0182* 0183*
BUSY	C	001	0CE6	0249	0185
CEMAX	A	004	0B2D	0111	0047*
DIMES	A	100	1DFB	0233	
ENIF	A	004	0AE3	0091	0088 0093
ERT1	A	0C2	0C99	0219	0016
E06	A	001	0A00	0003	
FIBIOF	A	003	0AD5	0087	0090 0095
FIRISE	A	004	0B17	0105	0103 0113
FLOOP	A	006	0C21	0183	0185
FOUR	A	0C2	0C44	0196	0065
FRTY	A	002	0C48	0198	0207
GAPWID	A	004	0BFB	0169	
GNIP	A	006	0BB0	0148	0136 0175
GOBAK	A	004	0B42	0120	0052*
GORK	A	004	0B46	0121	0123
HALT	C	001	0222	0247	0134 0144 0173 0187
HMMAX	A	004	0B74	0132	0051*
HMMIN	A	004	0B6D	0130	0050*
HOMCNT	A	0C2	0CA2	0225	0076* 0079*
HOMER	A	004	0B7B	0134	0131
HOMIN	A	100	130B	0231	0082* 0202
ITNAM	A	004	0AF9	0097	0048*
ITSUP	A	003	0B38	0114	0110
LASADR	A	002	0C50	0202	0066
LEEADR	A	002	0C9D	0222	0127 0129* 0130 0132 0158*
LEEAST	A	002	0C9F	0223	0127* 0129
LEEG	A	004	0BC2	0155	0157
LINK	C	001	0216	0245	0150
LKGAN	A	004	0AFD	0098	0104 0141
LPI	C	001	0800	0244	0077 0077 0078 0078
LPSUNT	A	001	0C9A	0220	0044* 0148*
LULSE	A	004	0BBE	0154	0124 0125 0126 0128 0137 0138
MAKADY	A	C15	0C95	0214	0041
MANTI	A	004	0B8C	0139	0049*
MRALT	A	003	0A3A	0043	0037
MSECS	A	001	0CA0	0224	0056* 0059* 0076
NEXEM	A	004	0AF5	0096	0143
NIMOH	A	100	1C07	0232	
NINE	A	002	0C46	0197	0059
NOOGOT	A	004	0A3D	0044	0035
NRDY	C	001	00E0	0248	0034
NRTIO	A	004	0A22	0034	0028
NTHOM	A	004	0B98	0142	0097* 0115 0139*
ONE	A	002	0C40	0194	0064 0079 0089 0091 0098 0101 0105 0108 0121 0146 0148 0155 0160 0161 0167 0168 0183
OOFF	A	0C2	0C58	0206	
PLEXIT	A	004	0C13	0176	0154* 0170
PRINT	C	001	021A	0246	0029 0038
PUMIN	A	004	0BE6	0164	
RETURN	A	004	0ACD	0082	0205
RTN1	A	001	0A0D	0023	0015
SAMADR	A	002	0C52	0203	0060
SAMCNT	A	001	0CA3	0226	0096* 0101* 0108* 0111 0142
SAMRET	A	002	1FF3	0236	0068*
SAMSAV	A	001	0CA4	0227	0159* 0160* 0164 0166* 0167* 0169
SAVR1	A	002	0CA6	0228	0116* 0140
SBYTE0	C	001	0208	0251	0027 0036

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SDC	A	006	0C1B	0182	0189
SEEWUN	A	004	0B84	0137	0133
SEMID	A	100	1FEF	0234	
SENIN	A	0C1	0EC0	0230	0062 0081 0086 0203
SISFR	A	002	0C4A	0199	0120
SKGOON	A	006	0A6D	0059	0147
SNAP	A	006	0BF1	0167	0172
SNIK	A	004	0AA1	0073	0075
SNOTSE	A	004	0A62	0056	0046 0149
SPUDT	A	003	0A0C	0017	0045
SSW05	C	001	0004	0253	0027 0036
STAT2	A	002	0C97	0218	0073* 0074
STUU	A	002	0C4E	0201	0060* 0061
TITL1	A	025	0C76	0212	0032
TOGOON	A	006	0A73	0060	0058
TOLONG	A	004	0C31	0187	0184
TOMNY	A	004	0BA0	0144	0112
TOUNT	A	001	0C9B	0221	0057* 0146*
TREE	A	002	0C42	0195	
TREG	A	006	0BD5	0160	0163
TSAL	A	006	0BA6	0146	0100 0107
TWA	A	006	0AB3	0077	0080
WIDER	A	004	0C09	0173	0165
XR1	C	001	0001	0242	0061* 0063 0064 0066 0086* 0087 0089* 0091* 0092 0094 0098* 0099 0102 0105* 0106 0109 0114 0116 0120* 0121* 0122 0140* 0155* 0156 0158 0161* 0162 0168* 0171
XR2	C	001	0002	0243	0062* 0063 0065*
ZROFF	A	002	1FF1	0235	

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY =

E063 52C3 CHAIN EMITTER TIMING TEST

OBJECT CARD LISTING

THE CHARACTER ' INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

T+-Y:8F<''&''B-4  <W;A&'D'"'@8A'H  H@/'HOH*BFUHRCG$  -'<G-BSX2/1&8A'H  H@Z'HOH*BFUD¬CIP  -8¬''424E0630001
T+-Z5¬'<@B-2E+B'  HC|H&FTO*B28@F&,  :|AU.TLOHB68@CO_  5C'D.J&1E|'&<YCO  HCI?2/OQ+''2-CDQ  <'&O':D<E0630002
T+-DOL-1KO-D<L%H  BC%+*'O''L-D'CD'  6'-1DL&C'CEC''&D  AC'<¬@O1OOH*<E3C  SCI*8'&2OOI'HY&O  'CHH'OIYE0630003
T+-,,CH'('"O-'B''  (+O-'B''|''2SCDC  ''/'D3OH*+OC0OD03  B'&#';B''@Z'H(-D  <&<BG8_M6'&1';B'  'OI''O'<E0630004
T+-%WB>(8'&C'D',  N|''<Y30Y39U6'&1  '¬L'B@YF¬C-'<YO1  ';B''@Z'DOH*H"LQ  ACDA'<'.2-QM+''2  TCD''@ZDE0630005
T+-_/;K''@Z'.|K4  <Y"HD$<BGB1|'8'&G  2UEY4'&2W(-D<KTQ  ACDA9H'C'U'_FOH*  .?%BGB##'/O>=C'D  <XOO'"8QE0630006
T+->*X*BGB#8|'&2  )CI@'D'2)@YHG|J%  <X¬HDB*BG'S.--?H  G.<BGB##'/O>=|@*  .WLMACH$'/O,"|&'  <Y@''¬$HE0630007
T+-?P'-,5OH*BH>B  'CO'<WO1'O'DH$&@  'CIY<&<'ABW.'/OH  O('-<ETQACDA8H'C  'U'?B('D<XLO'CH&  +''O'&3&E0630008
T+-OKZ'1'(-D<&G-  -'<'&B'M"'-2U@YH  *|''<Z'8'CH&<&CQ  ACD''&2U@Y&J;B'  'OI'.@*BG'S.--*B  GB#''&BQE0630009
T+-1(OH*''C&HCC8  <'/"6CE4|'/"6CDC  2-&¬A9-O/@Y*HOH*  BH>'JOH*<F@BG'''  ''&'C'&'B¬=8"8-  08-8':BME0630010
T+-2HOJ<(C%G'/O,  ('|@<K'&''<|HO*X  N&<PM2;|T1)V'8@X  M2)PG&+|E8>|MO).  E&|P2@|('6*PA1+/  ,8@-'#3HE0630011
TC'2N1)N'6*PS1;(  '2<GL80'''''''''  '''''''''''''''  '''''''''''''''  '''''''''''''''  '''''  5-&E0630012
E"""*E7*=¬DC"PH$  ="7M&F|'''|''C''  F%''ASC''R A''SO''Q  '''''''''''  '''''  20280202710  21971@$UE0630013
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LAST PAGE

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FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                2 *                                ORG'S AT 1F00    LAST CHG:04:21 75
                                3         DECK  4
                                4         SEQ   0
   0A00                         5 FF48    START X'A00'
                                6         TREP
                                7 ********************************************************************************
                                8 *
                                9 *       MASTER TIMING ANALYSIS PROGRAM
                               10 *
                               11 ********************************************************************************
                               12 *       SECTION PREFACE
                               13 ********************************************************************************
   0A00 FF48            0A01   14         DC    XL2'FF48'            PROGRAM ID AND REVISION LEVEL
   0A02 00              0A02   15         DC    XL1'00'              SECTION FLAGS
   0A03 00              0A03   16         DC    XL1'00'              CURRENT ROUTINE NUMBER
   0A04 0000            0A05   17         DC    XL2'0'
   0A06 0A0D            0A07   18         DC    AL2(RT01)            ADDRESS OF FIRST ROUTINE
   0A08 0000            0A09   19         DC    XL2'0'
   0A0A F01000          0A0C   20         DC    XL3'F01000'          UNIT DEFINITION TABLE
                               21 ********************************************************************************
                               22 *       ROUTINE 1 PREFIX
                               23 ********************************************************************************
   0A0D 01              0A0D   24 RT01    DC    XL1'01'              ROUTINE NUMBER
   0A0E 00              0A0E   25         DC    XL1'00'
   0A0F FFFF            0A10   26         DC    XL2'FFFF'
   0A11 C0 87 0222             27 RDCNTR B     HALT
   0A15 FFFF            0A16   28         DC    XL2'FFFF'
   0A17 3B FF 1543             29 COM    SBF   FLAGS2,X'FF'         TURN OFF FLAGS 10 THRU 17
   0A1B 0C 01 1679 15E3        30         MVC   LINE1+2,BLANK(2)
   0A21 0C 01 16D1 15E3        31         MVC   LINE2+2,BLANK(2)
   0A27 3C 00 1CF2             32         MVI   ORTAB+506,X'00'
   0A2B 3C FF 1EEF             33         MVI   ANDTAB+506,X'FF'
   0A2F 30 00 1615             34         SNS   WORK,X'00'           READ THE DATA SWITCHES
   0A33 3D AA 1614             35         CLI   WORK-1,X'AA'         *CK FOR AND BRANCH IF LOOP ON
   0A37 F2 81 86               36         JE    CKFE                  *RUNNING THE SAME TEST IS WANTED
   0A3A 38 80 0233             37         TBN   UTAB+1,X'80'         *CK FOR AND BRANCH IF NOT LOADING
   0A3E F2 10 08               38         JT    SNS                   *FROM A DIRECT ACCESS DEVICE
   0A41 3D A0 0232             39         CLI   UTAB,X'A0'
   0A45 C0 01 0A57             40         BNE   NEXTH
   0A49 30 00 0A53             41 SNS    SNS   DA,0
   0A4D C0 87 022A             42         B     LOAD                 *LOAD
   0A51 20              0A51   43         DC    XL1'20'               *FIRST
   0A52 0000            0A53   44 DA     DC    XL2'0'                 *RECORD
   0A54 F2 87 05               45         J     STOP
   0A57 C0 87 022A             46 NEXTH  B     LOAD                 *LOAD REST OF RECORDS
   0A5B 10              0A5B   47         DC    XL1'10'               *ONE AT A TIME
   0A5C 0C 5F 1F5F 08DF        48 STOP   MVC   RDFD+95,2271(96)
   0A62 C0 87 021A             49         B     PRINT
   0A66 01              0A66   50         DC    XL1'01'
   0A67 60              0A67   51         DC    XL1'96'
   0A68 1F5F            0A69   52         DC    AL2(RDFD+95)
   0A6A 3D F1 1F01             53         CLI   RDFD+1,X'F1'         *CK FOR AND BRANCH IF THIS IS NOT
   0A6E F2 01 1F               54         JNE   CARD                    FIRST CONTROL CARD
                               55 ********************************************************************************
                               56 *       CONTROL CARD 1 MODIFICATION OF PROGRAM
                               57 ********************************************************************************
   0A71 38 20 020D             58         TBN   SBYTE5,SWSW2A        *CK FOR AND BRANCH IF NOT WANTING
   0A75 F2 90 06               59         JF    FIRST1                *TO MAKE CHANGES TO THIS INFO
   0A78 C0 87 0222             60         B     HALT                 *HALT FOR CHANGES
   0A7C FFF1            0A7D   61         DC    XL2'FFF1'             *TO BE MADE
   0A7E C0 87 0226             62 FIRST1 B     PACK                 *PACK COMMANDS
   0A82 20              0A82   63         DC    XL1'32'               *AND DELAYS
   0A83 1F23            0A84   64         DC    AL2(RDFD+35)           *INTO CMND
   0A85 1F6F            0A86   65         DC    AL2(CMNDS+15)           *TABLE
   0A87 0C 0D 1556 1F31        66         MVC   CMND,RDFD+49(14)     MOVE CMND NAME INTO MSG
   0A8D F2 87 24               67         J     NEVER                GO READ ANOTHER CARD
   0A90 3D F2 1F01             68 CARD   CLI   RDFD+1,X'F2'         *CK FOR AND BRANCH IF THIS IS
   0A94 F2 81 4F               69         JE    CARD2                 *THE SECOND CONTROL CARD
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FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0A97 3D F3 1F01             70         CLI   RDFD+1,X'F3'         *CK FOR AND BRANCH IF THIS IS NOT
   0A9B F2 01 09               71         JNE   CARD4                 *THE THIRD CONTROL CARD
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              73 ********************************************************************************
                              74 *      CONTROL CARD 3 MODIFICATION OF PROGRAM
                              75 ********************************************************************************
 0A9E 0C 55 1677 1F57         76       MVC   LINE1,RDFD+87(86)      INSERT FIRST LINE OF BIT NAMES
 0AA4 F2 87 0D                77       J     NEVER                  GO READ ANOTHER CARD
 0AA7 3D F4 1F01              78 CARD4  CLI   RDFD+1,X'F4'         *CK FOR AND BRANCH IF THIS IS NOT
 0AAB F2 01 06                79       JNE   NEVER                   *THE FOURTH CONTROL CARD
                              80 ********************************************************************************
                              81 *      CONTROL CARD 4 MODIFICATION OF PROGRAM
                              82 ********************************************************************************
 0AAE 0C 55 16CF 1F57         83       MVC   LINE2,RDFD+87(86)      INSERT SECOND LINE OF BIT NAMES
 0AB4 3D C5 1F01              84 NEVER  CLI   RDFD+1,X'C5'
 0AB8 F2 01 16                85       JNE   CARD5
 0ABB C0 87 021A              86       B     PRINT
 0ABF 16            0ABF      87       DC    XL1'16'
 0AC0 38 40 1542              88 CKFE   TBN   FLAGS,FLAG1          *CK FOR AND BRANCH IF
 0AC4 F2 90 06                89       JP    CK0                    *NO HALT AFTER LAST CONTROL CARD
 0AC7 C0 87 0222              90       B     HALT
 0ACB FOFE          0ACC      91       DC    XL2'FOFE'
 0ACD C0 87 0E14              92 CK0    B     LETSGO               GO START THE PROGRAM
                              93 ********************************************************************************
                              94 *      CONTROL CARD 5 MODIFICATION OF PROGRAM
                              95 ********************************************************************************
 0AD1 3D F5 1F01              96 CARD5  CLI   RDFD+1,X'F5'
 0AD5 C0 01 0A57              97       BNE   NEXTH
 0AD9 C0 87 0226              98       B     PACK
 0ADD 54            0ADD      99       DC    IL1'84'
 0ADE 1F57          0ADF     100       DC    AL2(RDFD+87)
 0AE0 16FB          0AE1     101       DC    AL2(LIMITS+41)
 0AE2 C0 87 0A57             102       B     NEXTH
                             103 ********************************************************************************
                             104 *      CONTROL CARD 2 MODIFICATION OF PROGRAM
                             105 ********************************************************************************
 0AE6 38 20 020D             106 CARD2  TBN   SBITE5,SNSW2A         *CK FOR AND BRANCH IF NOT WANTING
 0AEA F2 90 06               107       JP    SECOND                 *TO CHANGE THIS INFO
 0AED C0 87 0222             108       B     HALT
 0AF1 FFF2          0AF2     109       DC    XL2'FFF2'
 0AF3 0C 03 1F75 1F17        110 SECOND MVC   MULT,RDFD+23(4)
 0AF9 0C 01 1478 1FC1        111       MVC   RAY02+3,DATA1(2)
 0AFF 3B 04 1543             112       SBF   FLAGS2,FLAG15
 0B03 3D 40 1F57             113       CLI   RDFD+87,X'40'          *CK FOR AND BRANCH IF
 0B07 F2 81 0A               114       JE    PACKIT                  *THIS AREA IS BLANK
 0B0A 3A 40 1543             115       SBN   FLAGS2,FLAG11          TURN ON SYNC-SAMP WANTED
 0B0E 0C 01 1CF4 1F57        116       MVC   SS,RDFD+87(2)          MOVE COUNT IN FOR SYNC-SAMP
 0B14 C0 87 0226             117 PACKIT B     PACK                  *PACK
 0B18 58            0B18     118       DC    IL1'88'                 *
 0B19 1F57          0B1A     119       DC    AL2(RDFD+87)              *
 0B1B 1727          0B1C     120       DC    AL2(DATFLD+43)              *
 0B1D 3B 06 0E95             121       SBF   TIOONE+1,X'08'         *SET OFF M BIT OF Q CODE
 0B21 3D C5 1F08             122       CLI   RDFD+4,X'C5'           *CK FOR AND BRANCH IF THIS
 0B25 C0 81 1F80             123       BE    LDPRNT                  *IS A PRINTER TAP
 0B29 0D 06 1F31 15E3        124       CLC   RDFD+49,BLANK(7)       *CK FOR AND BRANCH IF THIS
 0B2F C0 01 1FCA             125       BNE   LDDISK                  *IS A DISK TAP
 0B33 38 38 16FE             126       TBN   DATFLD+2,X'38'         *CK FOR AND BRANCH IF THIS IS
 0B37 39 C0 16FE             127       TBF   DATFLD+2,X'C0'          *NOT A
 0B3B F2 90 0A               128       JP    LDTHEN                  *2501 TAP
 0B3E 3A 08 0E95             129       SBN   TIOONE+1,X'08'         *SETUP FOR
 0B42 0C 01 0E84 1FC3        130       MVC   LET4+3,AFL(2)           *2501 TAP
 0B48 0C 00 0E73 170E        131 LDTHEN MVC   LET3+1(1),DATFLD+18    LOAD I/O
 0B4E 0C 00 0E82 170F        132       MVC   LET4+1(1),DATFLD+19    LOAD I/O
 0B54 0C 00 0E86 1710        133       MVC   LET5+1(1),DATFLD+20    LOAD I/O
 0B5A 0D 01 1F4B 15E3        134       CLC   RDFD+75,BLANK(2)       *CK FOR AND BRANCH IF
 0B60 F2 81 1B               135       JE    CK42                    *NO THIRD SYNC
 0B63 0C 03 1621 1F55        136       MVC   DELAY3,RDFD+85(4)      *MAKE SYNC 3 INSTRUCTION
 0B69 0C 02 0F47 1724        137       MVC   SYNC3+2,DATFLD+40(3)    *MODIFICATIONS
 0B6F 0C 00 0F43 1721        138       MVC   SENSE3+1(1),DATFLD+37   *
 0B75 0C 01 0F3A 0F4B        139       MVC   WAY+3,BACK3+3(2)
 0B7B F2 87 0F               140       J     SETUP2
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                             141 *
 0B7E 0D 01 1F3F 15E3        142 CK42   CLC   RDFD+63,BLANK(2)       *CK FOR AND BRANCH
 0B84 F2 81 1B               143        JE    CK411                   *IF NO SECOND SYNC
 0B87 0C 01 0F3A 0F6B        144        MVC   WAY+3,BACK2+3(2)
 0B8D 0C 03 161D 1F49        145 SETUP2 MVC   DELAY2,RDFD+73(4)     *MAKE SYNC 2 INSTRUCTION
 0B93 0C 02 0F67 171E        146        MVC   SYNC2+2,DATFLD+34(3)    *MODIFICATIONS
 0B99 0C 00 0F63 171B        147        MVC   SENSE2+1(1),DATFLD+31   *
 0B9F F2 87 1C               148        J     PACK1
                             149 *
 0BA2 3D E3 1F32             150 CK411  CLI   RDFD+50,X'E3'          *CK FOR SYNC ON TIO
 0BA6 F2 01 0F               151        JNE   CK41                    *AND BRANCH IF NOT
 0BA9 0C 00 0F3C 1716        152        MVC   TIOCND+1(1),DATFLD+26
 0BAF 0C 01 0F3A 1F8B        153        MVC   WAY+3,ATIO(2)
 0BB5 F2 87 18               154        J     CLEAR
                             155 *
 0BB8 0C 01 0F3A 0F8B        156 CK41   MVC   WAY+3,BACK1+3(2)
 0BBE 0C 03 1619 1F3D        157 PACK1  MVC   DELAY1,RDFD+61(4)     *MAKE SYNC 1 INSTRUCTION
 0BC4 0C 02 0F87 1718        158        MVC   SYNC1+2,DATFLD+28(3)    *MODIFICATIONS
 0BCA 0C 00 0F83 1715        159        MVC   SENSE1+1(1),DATFLD+25   *
 0BD0 0C 04 156C 15E3        160 CLEAR  MVC   HISTRY-22,BLANK(5)    CLEAR COUNTER
 0BD6 06 31 156C 15CB        161 SETSEG AZ    HISTRY-22(5),D50(2)   *ADD 50 FOR EACH
 0BDC 07 02 1F17 15D2        162        SZ    RDFD+23(3),D001(3)      *MICROSEC
 0BE2 C0 01 0BD6             163        BNZ   SETSEG                  *INCREMENT
 0BE6 0C 00 1016 16FE        164        MVC   SNS1+1(1),DATFLD+2      *SETUP
 0BEC 0C 00 0FAB 16FE        165        MVC   SNS3+1(1),DATFLD+2       *FIRST
 0BF2 0C 00 0FE1 16FE        166        MVC   SNS5+1(1),DATFLD+2        *SENSE
 0BF8 08 00 0E95 16FE        167        AZZ   TIOONE+1,DATFLD+2       SETUP TIO FOR EACH DEVICE
 0BFE 0C 03 1F7D 1F20        168        MVC   TIMES,RDFD+32(4)        LOAD NUMBER OF CMNDS TO BE SAMPLED
 0C04 0D 01 1F0D 15E3        169        CLC   RDFD+13,BLANK(2)        *CK FOR AND BRANCH
 0C0A F2 01 0C               170        JNE   UNDER6                   *IF TWO SENSE COMMANDS
 0C0D 0C 01 1704 15F3        171        MVC   DATFLD+8,ZERO(2)
 0C13 0C 00 1702 16FE        172        MVC   DATFLD+6(1),DATFLD+2
 0C19 0C 00 1019 1702        173 UNDER6 MVC   SNS2+1(1),DATFLD+6     *SETUP
 0C1F 0C 00 0FAE 1702        174        MVC   SNS4+1(1),DATFLD+6       *SECOND
 0C25 0C 00 0FE4 1702        175        MVC   SNS6+1(1),DATFLD+6        *SENSE
 0C2B 0C 00 1F70 1700        176        MVC   MASK1(1),DATFLD+4
 0C31 0C 00 14FE 16FF        177        MVC   OVER+4(1),DATFLD+3
 0C37 0C 00 150A 16FF        178        MVC   COMP+4(1),DATFLD+3
 0C3D 0C 00 1038 16FF        179        MVC   OVER3+4(1),DATFLD+3
 0C43 0C 00 104F 16FF        180        MVC   COMP3+4(1),DATFLD+3
 0C49 0E 00 1703 0CEA        181        ALC   DATFLD+7(1),FIX+1       ADD 2 TO DISPLACEMENT
 0C4F 0C 00 1F71 1704        182        MVC   MASK2(1),DATFLD+8
 0C55 0C 00 1520 1703        183        MVC   OVER22+4(1),DATFLD+7
 0C5B 0C 00 152C 1703        184        MVC   COMP22+4(1),DATFLD+7
 0C61 0C 00 106F 1703        185        MVC   OVER33+4(1),DATFLD+7
 0C67 0C 00 1086 1703        186        MVC   COMP33+4(1),DATFLD+7
 0C6D 0D 01 1707 15D6        187        CLC   DATFLD+11,TEN(2)        *CK FOR AND BRANCH IF LESS THAN 500
 0C73 F2 82 5B               188        JL    UNDER                    *MICRO SECOND SAMPLE TIME
 0C76 0C 01 0FA9 1106        189        MVC   WHERE+3,TAB1+3(2)       SETUP TO SAVE DATA AS SENSED
 0C7C 0D 01 1F0B 15E3        190        CLC   RDFD+11,BLANK(2)        *CK FOR AND BRANCH IF THIS IS
 0C82 F2 01 16               191        JNE   FIFTY1                   *BYTE TO 50MIC SAMPLE INTO
 0C85 0D 01 1F13 15E3        192        CLC   RDFD+19,BLANK(2)        *CK FOR AND BRANCH IF THIS IS
 0C8B F2 01 28               193        JNE   FIFTY2                   *BYTE TO 50MIC SAMPLE INTO
 0C8E 0C 00 1F03 16FE        194        MVC   RDFD+3(1),DATFLD+2      *INITIALIZE TO IGNORE DATA WHICH
 0C94 3C C8 1F5B             195        MVI   RDFD+91,X'C8'            *WILL BE SAMPLED EVERY 50MIC
 0C98 F2 87 4E               196        J     FIX
                             197 *
 0C9B 0C 00 1F03 16FE        198 FIFTY1 MVC   RDFD+3(1),DATFLD+2      MOVE FIRST SNS CMND IN FOR -50
 0CA1 3D 01 16FF             199        CLI   DATFLD+3,X'01'          *CK FOR AND BRANCH IF LOW ADDR
 0CA5 F2 01 07               200        JNE   LEFT1                    *BYTE IS TO BE -ORED- INTO
 0CA8 3C D5 1F5B             201        MVI   RDFD+91,X'D5'           SETUP TO -OR- INTO HIGH ADDRESS
 0CAC F2 87 3A               202        J     FIX
                             203 *
 0CAF 3C C4 1F5B             204 LEFT1  MVI   RDFD+91,X'C4'           SETUP TO -OR- INTO LOW ADDRESS
 0CB3 F2 87 33               205        J     FIX
                             206 *
 0CB6 0C 00 1F03 1702        207 FIFTY2 MVC   RDFD+3(1),DATFLD+6     MOVE SECOND SNS CMND IN FOR -50
 0CBC 3D 03 1703             208        CLI   DATFLD+7,X'03'          *CK FOR AND BRANCH IF LOW ADDRESS
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FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    0CC0 F2 01 07               209        JNE   LEFT2                 *BYTE IS TO BE -ORED- INTO
    0CC3 3C D7 1F5B             210        MVI   RDFD+91,X'D7'         SETUP TO -OR- INTO HIGH ADDRESS BYTE
    0CC7 F2 87 1F               211        J     FIX
                                212 *
    0CCA 3C C6 1F5B             213 LEFT2  MVI   RDFD+91,X'C6'         SETUP TO -OR- INTO LOW ADDRESS BYTE
    0CCE F2 87 18               214        J     FIX
    0CD1 0D 01 1707 15F4        215 UNDER  CLC   DATFLD+11,ONE(2)      *CK FOR AND BRANCH IF ONLY
    0CD7 F2 81 09               216        JE    JUMPIT                 *50 MICROSEC SAMPLE TIME
    0CDA 0C 01 0FA9 1010        217        MVC   WHERE+3,TAB5+3(2)     SETUP TO DELAY BETWEEN SAMPLE TIMES
    0CE0 F2 87 06               218        J     FIX
                                219 *
    0CE3 0C 01 0FA9 0FBC        220 JUMPIT MVC   WHERE+3,TAB3+3(2)     SETUP TO SAMPLE EVERY 50 MICROSEC
    0CE9 0C 02 1606 1F1B        221 FIX    MVC   SAMPLE,RDFD+27(3)     SETUP SAMPLE COUNT CONSTANT
    0CEF 0C 02 1609 1F1B        222        MVC   NUMBER,RDFD+27(3)
    0CF5 06 02 1609 15FD        223        AZ    NUMBER(3),D002(3)
    0CFB 0D 03 1619 15D1        224        CLC   DELAY1,D001-1(4)      *CK FOR AND BRANCH IF THERE IS
    0D01 F2 01 09               225        JNE   ORIGIN                 *A DELAY AFTER THE FINAL SYNC
    0D04 0C 02 0F8F 0FA9        226        MVC   NOWAIT+3,WHERE+3(3)   SETUP TO BR IMMEDIATELY TO SAMPLE
    0D0A F2 87 04               227        J     GETON
                                228 *
    0D0D 3C 80 0F8D             229 ORIGIN MVI   NOWAIT+1,X'80'        NO-OP THE BRANCH COMMAND
    0D11 08 03 1022 1F5B        230 GETON  MNN   DD1+2,RDFD+91         *
    0D17 C2 01 1F03             231        LA    RDFD+3,XR1
    0D1B 1C 00 102A 00          232        MVC   AA1+1(1),0(,XR1)      *
    0D20 1C 00 1041 00          233        MVC   AA2+1(1),0(,XR1)      *
    0D25 1C 00 105A 00          234        MVC   AA3+1(1),0(,XR1)      *
    0D2A 1C 00 1071 00          235        MVC   AA4+1(1),0(,XR1)      *
    0D2F 1C 00 1088 00          236        MVC   AA5+1(1),0(,XR1)      **MOVE SNS IN FOR 50MIC SAMPLE
    0D34 1C 00 10A0 00          237        MVC   AA6+1(1),0(,XR1)      *
    0D39 1C 00 10B7 00          238        MVC   AA7+1(1),0(,XR1)      *
    0D3E 1C 00 10CB 00          239        MVC   AA8+1(1),0(,XR1)      *
    0D43 1C 00 10E0 00          240        MVC   AA9+1(1),0(,XR1)      *
    0D48 1C 00 10F1 00          241        MVC   AA10+1(1),0(,XR1)     *
    0D4D 08 02 1030 1F5B        242        MNZ   BB1+4,RDFD+91         *
    0D53 08 02 1047 1F5B        243        MNZ   BB2+4,RDFD+91         *
    0D59 08 02 1060 1F5B        244        MNZ   BB3+4,RDFD+91         *
    0D5F 08 02 1077 1F5B        245        MNZ   BB4+4,RDFD+91         *
    0D65 08 02 108E 1F5B        246        MNZ   BB5+4,RDFD+91         **SETUP TO SAVE PROPER BYTE
    0D6B 08 02 10A6 1F5B        247        MNZ   BB6+4,RDFD+91         *
    0D71 08 02 10BD 1F5B        248        MNZ   BB7+4,RDFD+91         *
    0D77 08 02 10D1 1F5B        249        MNZ   BB8+4,RDFD+91         *
    0D7D 08 02 10E6 1F5B        250        MNZ   BB9+4,RDFD+91         *
    0D83 08 02 10F7 1F5B        251        MNZ   BB10+4,RDFD+91
    0D89 0D 01 1F33 15E3        252        CLC   RDFD+51,BLANK(2)
    0D8F F2 01 06               253        JNE   SET1
    0D92 0C 01 0F3A 1FBF        254        MVC   WAY+3,ANOHT(2)
    0D98 3A 40 1542             255 SET1   SBN   FLAGS,FLAG1           TURN ON HALT WANTED FLAG
    0D9C 3D C8 1F22             256        CLI   RDFD+34,X'C8'         *CK FOR AND BRANCH IF NO HALT
    0DA0 F2 81 04               257        JE    LATER                  *AFTER LAST CONTROL CARD IS WANTED
    0DA3 3B 40 1542             258        SBF   FLAGS,FLAG1           TURN OFF HALT WANTED FLAG
    0DA7 0C 01 14D2 1FB1        259 LATER  MVC   CT11,ALINE1(2)         *PRINTOUT AREA
    0DAD 0C 01 14DA 1FB3        260        MVC   CT22,ALINE2(2)          *ADDRESSES
    0DB3 3C 00 14D0             261        MVI   CT1,X'00'             *INITIALIZE
    0DB7 3C 00 14D8             262        MVI   CT2,X'00'              *MSG PRINT
    0DBB 3C 00 14E0             263        MVI   CT3,X'00'               LENGTHS
    0DBF 0C 01 0DC8 1FB9        264        MVC   THESE+3,AMASK2(2)
    0DC5 38 01 0000             265 THESE  TBN   *-*,X'01'             *CK FOR AND BRANCH IF THIS
    0DC9 F2 90 24               266        JF    SHIFT                  *BIT IS NOT TO BE CHECKED
    0DCC 0E 01 14D2 15D8        267        ALC   CT11,ELEVEN(2)
    0DD2 0E 01 14DA 15D8        268        ALC   CT22,ELEVEN(2)
    0DD8 0E 00 14D0 15D8        269        ALC   CT1(1),ELEVEN
    0DDE 0E 00 14D8 15D8        270        ALC   CT2(1),ELEVEN
    0DE4 0E 00 14E0 15D8        271        ALC   CT3(1),ELEVEN
    0DEA 0F 01 1478 15D8        272        SLC   RAY02+3,ELEVEN(2)
    0DF0 0E 00 0DC6 0DC6        273 SHIFT  ALC   THESE+1(1),THESE+1    *SHIFT MASK BIT ONE POSITION LEFT
    0DF6 C0 01 0DC5             274        BNZ   THESE                  *AND BR IF MASK DOES NOT GO TO 0
    0DFA 3C 01 0DC6             275        MVI   THESE+1,X'01'         INITIALIZE MASK TO -01-
    0DFE 38 04 1543             276        TBN   FLAGS2,FLAG15         *CK FOR AND BRANCH IF BOTH
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FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    0E02 C0 10 0A57             277        BT    NEXTM                 *BYTES HAVE BEEN CHECKED
    0E06 3A 04 1543             278        SBN   FLAGS2,FLAG15
    0E0A 0C 01 0DC8 1FB7        279        MVC   THESE+3,AMASK1(2)
    0E10 C0 87 0DC5             280        B     THESE
                                281 ***********************************************************************
                                282 *      BEGIN EXECUTION OF COMMANDS
                                283 ***********************************************************************
    0E14 3B 1B 1542             284 LETSGO SBF   FLAGS,X'1B'           TURN OFF FLAGS    3, 4, 6, 7
    0E18 0C 03 1547 15E3        285        MVC   MANY,BLANK(4)         CLEAR CARDS CHECKED COUNTER
    0E1E 0C 03 1F79 1F7D        286        MVC   PASSES,TIMES(4)       LOAD NUMBER OF CMNDS TO BE SAMPLED
    0E24 38 F0 0F83             287         TBN   SENSE1+1,X'F0'       *CK FOR AND BRANCH IF
    0E28 F2 10 0D               288         JT    ISMFCU                *MFCU SENSE COMMAND
    0E2B 3C 87 0F13             289        MVI   ONLY1+1,X'87'         SETUP TO SAMPLE IMMEDIATELY
    0E2F 0C 03 0E8C 15F8        290 MAYBE  MVC   TIOTWO+3,NOT1+3(4)    NO-OP FIRST MFCU TIO BUSY
    0E35 F2 87 18               291         J     LETS
                                292 *
    0E38 38 10 020D             293 ISMFCU TBN   SBYTE5,SNSM2B         *CK FOR AND BRANCH IF
    0E3C F2 10 07               294        JT    BYPASS                 *FILL COMMAND IS NOT WANTED
    0E3F 3C 10 0F13             295        MVI    ONLY1+1,X'10'        SETUP TO PRIME MFCU
    0E43 F2 87 04               296        J     INIT2
                                297 *
    0E46 3C 97 0F13             298 BYPASS MVI   ONLY1+1,X'97'         SETUP TO SAMPLE IMMEDIATELY
    0E4A F3 F0 C0               299 INIT2  SIO   X'00',X'F0'           PRIM PRIMARY
    0E4D F3 F8 00               300        SIO   X'00',X'F8'           PRIM SECONDARY
    0E50 0C FE 1CF1 1CF2        301 LETS   MVC   ORTAB+505,ORTAB+506(255) *INITIALIZE -OR- TABLE
    0E56 0C FB 1BF3 1BF4        302        MVC   ORTAB+251,ORTAB+252(252)  *TO ALL ZEROS
    0E5C 0C FE 1EEE 1EEF        303        MVC   ANDTAB+505,ANDTAB+506(255) *INITIALIZE -AND- TABLE
    0E62 0C FB 1DF0 1DF1        304        MVC   ANDTAB+251,ANDTAB+252(252)   *TO ALL ONES
    0E68 C2 01 1F60             305 NEXTCD LA    CMNDS,XR1             LOAD ADDR OF CMNDS INTO XR1
    0E6C 0C 03 159D 1F75        306        MVC   SETPRT,MULT(4)        LOAD SAMPLE TIME COUNT CONSTANT
    0E72 31 F4 1FAF             307 LET3   LIO   LDRD,X'F4'
    0E76 3D F4 0E73             308        CLI   LET3+1,X'F4'          *CK FOR AND BRANCH IF THIS IS NOT A
    0E7A F2 01 04               309        JNE   LET4                   *MFCU PRINT LIO
    0E7D 3C F5 0E73             310        MVI   LET3+1,X'F5'          SETUP FOR READ LIO INSTEAD OF PRINT
    0E81 31 F5 1FAF             311 LET4   LIO   LDRD,X'F5'
    0E85 31 F6 1FAF             312 LET5   LIO   LDRD,X'F6'
    0E89 C1 F8 112D             313 TIOTWO TIO   DIAG,X'F8'            BRANCH IF ERROR OR NOT READY
    0E8D 39 E0 0E95             314 KBTST  TBF   TIOONE+1,X'E0'        IS THIS CONSOLE I/O OR 2956
    0E91 F2 10 04               315        JT    CLCCOM                IF SO, SKIP OVER TIO
    0E94 C1 F0 112D             316 TIOONE TIO   DIAG,X'F0'            BRANCH IF ERROR OR NOT READY
    0E98 4D 01 03 15F3          317 CLCCOM CLC   3(2,XR1),ZERO         *CK FOR AND BRANCH IF THIS IS THE
    0E9D F2 81 5B               318        JE    SAMP                   *COMMAND TO BE SAMPLED
    0EA0 79 F0 00               319        TBF   0(,XR1),X'F0'         *CK FOR AND BRANCH IF THIS IS NOT
    0EA3 F2 90 3B               320        JF    NODLAY                 *A TIME DELAY BETWEEN COMMANDS
    0EA6 1C 01 1615 01          321        MVC   WORK,1(2,XR1)         LOAD DELAY COUNT
    0EAB C0 87 021E             322        B     UNPACK
    0EAF 02                0EAF 323        DC    IL1'2'
    0EB0 1615              0EB1 324        DC    AL2(WORK)
    0EB2 1611              0EB3 325        DC    AL2(WORK-4)
    0EB4 0E 02 1602 15F4        326 DELAY7 ALC   DELAY,ONE(3)
    0EBA 07 20 1611 15D2        327        SZ    WORK-4(3),D001(1)
    0EC0 C0 01 0EB4             328        BNZ   DELAY7
    0EC4 35 02 15DA             329 RELOAD L     D6579,XR2             *DELAY
    0EC8 36 02 15F1             330 DLY1   A     FFFF,XR2               *100
    0ECC C0 84 0EC8             331        BH    DLY1                    *MSEC
    0ED0 0F 02 1602 15F4        332        SLC   DELAY(3),ONE          *CK FOR AND BRANCH BACK IF
    0ED6 C0 01 0EC4             333        BNZ   RELOAD                 *DELAY FACTOR HAS NOT GONE TO ZERO
    0EDA D2 01 02               334        LA    2(,XR1),XR1
    0EDD C0 87 0E89             335        B     TIOTWO
                                336 *
    0EE1 1C 01 0EF3 01          337 NODLAY MVC   XCUTE+2,1(2,XR1)      MOVE CMND IN FOR EXECUTION
    0EE6 1C 01 15EA 01          338        MVC   TIME,1(2,XR1)
    0EEB 0C 00 1FC6 1FC9        339        MVC   DISK-1,OPISIT(1)
    0EF1 F3 00 00               340 XCUTE  SIO   0,0
    0EF4 D2 01 02               341        LA    2(,XR1),XR1
    0EF7 C0 87 0E72             342        B     LET3                  BR BACK TO CK NEXT CMND
                                343 *
    0EFB 1C 01 0F0D 01          344 SAMP   MVC   XCUTE2+2,1(2,XR1)     MOVE CMND IN FOR EXECUTION
```

FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0F00 1C 01 15EA 01         345        MVC   TIME,1(2,XR1)
 0F05 0C 00 1FC6 1FC8       346        MVC   DISK-1,BACK(1)
 0F0B F3 00 00              347 XCUTE2 SIO   0,0                EXECUTE CMND TO BE SAMPLED
 0F0E 38 10 1542            348        TBN   FLAGS,FLAG3
 0F12 F2 10 08              349 ONLY1  JT    START
 0F15 3A 10 1542            350        SBN   FLAGS,FLAG3
 0F19 C0 87 0E68            351        B     NEXTCD
                            352 *
 0F1D 0C 02 15EF 1609       353 START  MVC   CHECK1,NUMBER(3)  LOAD SAMPLE COUNT
 0F23 C2 01 16FC            354        LA    DATFLD,XR1         LOAD DATA FIELD ADDRESS
 0F27 C2 02 1AF8            355        LA    ORTAB,XR2
 0F2B 7C 00 0A              356        MVI   10(,XR1),X'00'
 0F2E 7C 00 0E              357        MVI   14(,XR1),X'00'
 0F31 06 30 1547 15D2       358        AZ    MANY(4),D001(1)    ADD ONE TO CMNDS CHECKED COUNT
 0F37 C0 87 0F3B            359 MAY    B     *+4                BRANCH TO FIRST SENSE REQUIRED
                            360 ********************************************************************
                            361 *      SYNC ON TIO CONDITION GOING OFF
                            362 ********************************************************************
 0F3B C1 00 0F3B            363 TIOCND TIO   *,*-*
 0F3F F2 87 64              364        J     WHERE
```


FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT

                            366 ********************************************************************
                            367 *      START HERE IF 3 SYNCS
                            368 ********************************************************************
 0F42 70 00 01              369 SENSE3 SNS   1(,XR1),*-*        STORE DESIRED DATA
 0F45 78 00 00              370 SYNC3  TBN   *-*(,XR1),*-*      *CK FOR AND BRANCH IF SYNC BIT IS
 0F48 C0 90 0F42            371 BACK3  BF    SENSE3             *NOT IN THE CONDITION SPECIFIED
 0F4C 0C 03 1615 1621       372        MVC   WORK,DELAY3(4)     LOAD A DELAY COUNT
 0F52 07 30 1615 15D2       373 SUB3   SZ    WORK(4),D001(1)    DECREMENT THE DELAY COUNT
 0F58 0C 05 1611 1611       374        MVC   WORK-4,WORK-4(6)   DELAY 18 MACHINE CYCLES
 0F5E C0 84 0F52            375        BP    SUB3               LOOP IF COUNT IS NOT 0 BUT IS PLUS
                            376 ********************************************************************
                            377 *      START HERE IF 2 SYNCS
                            378 ********************************************************************
 0F62 70 00 01              379 SENSE2 SNS   1(,XR1),*-*        STORE DESIRED DATA
 0F65 78 00 00              380 SYNC2  TBN   *-*(,XR1),*-*      *CK FOR AND BRANCH IF SYNC BIT IS
 0F68 C0 90 0F62            381 BACK2  BF    SENSE2             *NOT IN THE CONDITION SPECIFIED
 0F6C 0C 03 1615 161D       382        MVC   WORK,DELAY2(4)     LOAD A DELAY COUNT
 0F72 07 30 1615 15D2       383 SUB2   SZ    WORK(4),D001(1)    DECREMENT THE DELAY COUNT
 0F78 0C 05 1611 1611       384        MVC   WORK-4,WORK-4(6)   DELAY 18 MACHINE CYCLES
 0F7E C0 84 0F72            385        BP    SUB2               LOOP IF COUNT IS NOT 0 BUT IS PLUS
                            386 ********************************************************************
                            387 *      START HERE IF 1 SYNC
                            388 ********************************************************************
 0F82 70 00 01              389 SENSE1 SNS   1(,XR1),*-*        STORE DESIRED DATA
 0F85 78 00 00              390 SYNC1  TBN   *-*(,XR1),*-*      *CK FOR AND BRANCH IF SYNC BIT IS
 0F88 C0 90 0F82            391 BACK1  BF    SENSE1             *NOT IN THE CONDITION SPECIFIED
 0F8C C0 87 0F90            392 NOWAIT B     *+4                BR TO START SAMPLES IF NO DELAY
 0F90 0C 03 1615 1619       393        MVC   WORK,DELAY1(4)     LOAD A DELAY COUNT
 0F96 07 30 1615 15D2       394 SUB1   SZ    WORK(4),D001(1)    DECREMENT THE DELAY COUNT
 0F9C 0C 05 1611 1611       395        MVC   WORK-4,WORK-4(6)   DELAY 18 MACHINE CYCLES
 0FA2 C0 84 0F96            396        BP    SUB1               LOOP IF COUNT IS NOT 0 BUT IS PLUS
 0FA6 C0 87 0FAA            397 WHERE  B     *+4
                            398 ********************************************************************
                            399 *      START SAMPLING
                            400 ********************************************************************
                            401 *      SENSE EVERY 50 MICRO-SEC ONLY
                            402 ********************************************************************
 0FAA 70 00 05              403 SNS3   SNS   5(,XR1),*-*
 0FAD 70 00 07              404 SNS4   SNS   7(,XR1),*-*
 0FB0 D2 01 04              405        LA    4(,XR1),XR1
 0FB3 07 04 15EF 15D2       406        SZ    CHECK1(5),D001(5)  *DECREMENT SAMPLE COUNT AND LOOP
 0FB9 C0 01 0FAA            407 TAB3   BNZ   SNS3               *BACK IF IT IS NOT TO ZERO
 0FBD C2 01 16FC            408 NOWDO  LA    DATFLD+0,XR1       LOAD DATA FIELD ADDRESS
 0FC1 C2 02 1AF8            409        LA    ORTAB+0,XR2        LOAD THE ADDRESS OF THE -OR- TABLE
 0FC5 0C 02 15EF 1609       410        MVC   CHECK1,NUMBER(3)
 0FCB C0 87 14F6            411 SAVEIT B     SETUP1             GO SAVE DATA
 0FCF D2 01 04              412        LA    4(,XR1),XR1
 0FD2 07 21 15EF 15D2       413        SZ    CHECK1(4),D001(2)
 0FD8 C0 01 0FCB            414        BNZ   SAVEIT
 0FDC C0 87 1107            415 OUT2   B     ERROR
                            416 ********************************************************************
                            417 *      SENSE EVERY 100-450 MICRO-SEC
                            418 ********************************************************************
 0FE0 70 C0 05              419 SNS5   SNS   5(,XR1),*-*
 0FE3 70 00 07              420 SNS6   SNS   7(,XR1),*-*
 0FE6 07 30 159D 15D2       421        SZ    SETPRT(4),D001(1)  11 DECREMENT SAMPLE TIME COUNT BY
 0FEC F2 87 05              422        J     WAIT50              3
 0FEF 1C 06 1614 00         423 WAIT15 MVC   WORK-1,0(7,XR1)    19 DELAY 19 MACHINE CYCLES
 0FF4 07 20 159D 15D2       424 WAIT50 SZ    SETPRT(3),D001(1)  10 DECREMENT SAMPLE TIME COUNT BY
 0FFA C0 84 0FEF            425        BH    WAIT15              4
 0FFE D2 01 04              426        LA    4(,XR1),XR1         3
 1001 0C 01 159D 1F75       427        MVC   SETPRT,MULT(2)      10 LOAD SAMPLE TIME COUNT
 1007 07 30 15EF 15D2       428        SZ    CHECK1(4),D001(1)   11 *DECREMENT SAMPLE COUNT AND C
 100D C0 01 0FE0            429 TAB5   BNZ   SNS5                4  *TO SAMPLE IF COUNT IS NOT ZE
 1011 C0 87 0FBD            430        B     NOWDO
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          432 ********************************************************************************
                          433 *       SENSE EVERY 50 MICRO-SEC WHILE SAVING THE LAST STATUS
                          434 ********************************************************************************
 1015 70 00 05            435 SNS1    SNS   5(,XR1),*-*
 1018 70 00 07            436 SNS2    SNS   7(,XR1),*-*
 101B 1C 00 1021 0A       437         MVC   DD1+1,10(1,XR1)       *-OR- ACCUMULATED DATA INTO REGULAR
 1020 7A 00 00            438 DD1     SBM   *-*(,XR1),*-*          *STATUS AREA BEFORE SAVING IT
 1023 0C 03 159D 1F75     439         MVC   SETPRT,MULT(4)        LOAD SAMPLE TIME COUNT CONSTANT
 1029 70 00 0D            440 AA1     SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 102C 1C 00 1032 00       441 BB1     MVC   CC1+1,*-*(1,XR1)       *BYTE SPECIFIED EVERY
 1031 7A 00 0E            442 CC1     SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 1034 1C 00 103A 00       443 OVER3   MVC   00+1,*-*(1,XR1)       MOVE BYTE OF DATA INTO MASK
 1039 BA 00 00            444 00      SBM   0(,XR2),X'00'         -OR- DATA INTO ALL ZERO TABLE
 103C 36 02 1F7F          445         A     D509,XR2              ADD 509 TO XR2
 1040 70 00 0D            446 AA2     SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 1043 1C 00 1049 00       447 BB2     MVC   CC2+1,*-*(1,XR1)       *BYTE SPECIFIED EVERY
 1048 7A 00 0E            448 CC2     SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 104B 1F 00 15DC 00       449 COMP3   SLC   SAVEF,*-*(1,XR1)      COMPLEMENT DATA
 1050 0C 00 1065 15DC     450         MVC   ADD+1(1),SAVEF        MOVE COMPLEMENTED DATA INTO MASK
 1056 F2 87 00            451         J     *+3                   DELAY 3 MACHINE CYCLES
 1059 70 00 0D            452 AA3     SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 105C 1C 00 1062 00       453 BB3     MVC   CC3+1,*-*(1,XR1)       *BYTE SPECIFIED EVERY
 1061 7A 00 0E            454 CC3     SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 1064 BB 00 00            455 ADD     SBF   0(,XR2),X'00'         -AND- DATA INTO ALL ONES TABLE
 1067 36 02 15FA          456         A     D508,XR2              SUBTRACT 508 FOR NEXT -OR- TABLE ADD
 106B 1C 00 107C 00       457 OVER33  MVC   OR33+1,*-*(1,XR1)     MOVE BYTE OF DATA INTO MASK
 1070 70 00 0D            458 AA4     SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 1073 1C 00 1079 00       459 BB4     MVC   CC4+1,*-*(1,XR1)       *BYTE SPECIFIED EVERY
 1076 7A 00 0E            460 CC4     SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 107B BA 00 00            461 OR33    SBM   0(,XR2),X'00'         -OR- DATA INTO ALL ZERO TABLE
 107E 36 02 1F7F          462         A     D509,XR2              ADD 509 TO XR2
 1082 1F 00 15DB 00       463 COMP33  SLC   SAVEF-1,*-*(1,XR1)    COMPLEMENT DATA
 1087 70 00 0D            464 AA5     SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 108A 1C 00 1090 00       465 BB5     MVC   CC5+1,*-*(1,XR1)       *BYTE SPECIFIED EVERY
 108F 7A 00 0E            466 CC5     SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 1092 0C 00 1099 15DB     467         MVC   AND33+1(1),SAVEF-1    MOVE COMPLEMENTED DATA INTO MASK
 1098 BB 00 00            468 AND33   SBF   0(,XR2),X'00'         -AND- DATA INTO ALL ONES TABLE
 109B 3C FF 15DC          469         MVI   SAVEF,X'FF'           RE-ENITIALIZE
 109F 70 00 0D            470 AA6     SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 10A2 1C 00 10A8 00       471 BB6     MVC   CC6+1,*-*(1,XR1)       *BYTE SPECIFIED EVERY
 10A7 7A 00 0E            472 CC6     SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 10AA 3C FF 15DB          473         MVI   SAVEF-1,X'FF'         RE-ENITIALIZE
 10AE 36 02 15FA          474         A     D508,XR2              SUBTRACT 508 FOR NEXT -OR- TABLE ADD
 10B2 C0 87 10B6          475         B     *+4
 10B6 70 00 0D            476 AA7     SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 10B9 1C 00 10BF 00       477 BB7     MVC   CC7+1,*-*(1,XR1)       *BYTE SPECIFIED EVERY
 10BE 7A 00 0E            478 CC7     SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 10C1 07 21 159D 15D4     479         SZ    SETPRT(4),P1P0(2)   12 DECREMENT SAMPLE TIME COUNT BY 10
 10C7 F2 87 11            480         J     FINSH1               3
 10CA 70 00 0D            481 AA8     SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 10CD 1C 00 10D3 00       482 BB8     MVC   CC8+1,*-*(1,XR1)       *BYTE SPECIFIED EVERY
 10D2 7A 00 0E            483 CC8     SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 10D5 07 12 159D 15D2     484         SZ    SETPRT(4),D001(3)   13 DECREMENT SAMPLE TIME COUNT BY 1
 10DB C0 84 10CA          485 FINSH1  BH    AA8                  4
 10DF 70 00 0D            486 AA9     SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 10E2 1C 00 10E8 00       487 BB9     MVC   CC9+1,*-*(1,XR1)       *BYTE SPECIFIED EVERY
 10E7 7A 00 0E            488 CC9     SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 10EA 07 03 15EF 15D2     489         SZ    CHECK1(4),D001(4)     DECREMENT SAMPLE COUNT
 10F0 70 00 0D            490 AA10    SNS   13(,XR1),*-*          *SENSE AND -OR- ONE
 10F3 1C 00 10F9 00       491 BB10    MVC   CC10+1,*-*(1,XR1)      *BYTE SPECIFIED EVERY
 10F8 7A 00 0E            492 CC10    SBM   14(,XR1),*-*           *50 MICRO-SECONDS
 10FB D2 01 04            493         LA    4(,XR1),XR1
 10FE 4C 01 0E 15F3       494         MVC   14(,XR1),ZERO(2)    9 CLEAR AREA TO -OR- 50 MICROSEC SAMP
 1103 C0 01 1015          495 TAB1    BNZ   SNS1                 BR IF ALL SAMPLES NOT TAKEN YET
 1107 38 80 020D          496 ERROR   TBM   SBYTE5,SNSW28        *CK FOR AND BRANCH IF PRINT
 110B C0 10 0B50          497         BT    LETS                  *ON ERROR OR NOT RDY ONLY
 110F 38 40 1543          498         TBM   FLAGS2,FLAG11         *CK FOR AND BRANCH IF NO
 1113 F2 90 0A            499         JP    ALLIN                 *SYNC-SAMP IS WANTED
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1116 07 10 1CF4 15D2        500         SZ    SS(2),D001(1)       DECREMENT SYNC-SAMP COUNT
 111C C0 01 0F1D             501         BNZ   START               LOOP IF NOT TO ZERO
 1120 07 30 1F79 15D2        502 ALLIN   SZ    PASSES(4),D001(1)   SUBTRACT 1 FOR NO. OF REQ SAMPLINGS
 1126 F2 81 1C               503         JZ    ALLOUT
 1129 C0 87 0B68             504         B     NEXTCD
                             505 *
 112D 38 80 020D             506 DIAG    TBM   SBYTE5,SNSW28       *CK FOR AND GO PRINT NORMAL DATA
 1131 C0 90 1145             507         BF    ALLOUT                *IF PRINT ONLY ON ERROR IS OFF
 1135 0C 01 0FDF 1FB5        508         MVC   OUT2+3,AHOW(2)
 113B C0 87 0FBD             509         B     NOWDO
                             510 *
 113F 0C 01 0FDF 1FBD        511 HOW     MVC   OUT2+3,AERROR(2)
 1145 0C 01 1AFB 1AFD        512 ALLOUT  MVC   ORTAB+3,ORTAB+5(2)  *INITIALIZE FIRST 2 BYTES OF ORTAB
 114B 0C 01 1CF8 1CFA        513         MVC   ANDTAB+3,ANDTAB+5(2)  *AND ANDTAB FOR PRINTING
 1151 0D 03 1547 15E3        514         CLC   MANY,BLANK(4)       *BRANCH TO CAT IF DATA HAS
 1157 F2 01 0A               515         JNE   CAT                  *BEEN TAKEN
 115A C0 87 0222             516         B     HALT
 115E FFF9            115F   517         DC    XL2'FFF9'
 1160 C0 87 0A17             518         B     COM
 1164 C0 87 021E             519 CAT     B     UNPACK
 1168 02              1168   520         DC    IL1'2'
 1169 15EA            116A   521         DC    AL2(TIME)
 116B 1592            116C   522         DC    AL2(LAST)
 116D 0C 01 1615 15FF        523         MVC   WORK,TWO380(2)
 1173 0F 01 1615 15F8        524 WAIT    SLC   WORK,ONE(2)
 1179 C0 01 1173             525         BNZ   WAIT
 117D 0C 06 15EA 15D1        526 SCOPE   MVC   TIME,D001-1(7)      CLEAR TIME PRINTOUT
 1183 3C 00 1756             527         MVI   LINECT,X'00'        INITIALIZE LIMITS LINE COUNT
 1187 C2 01 1AFA             528         LA    ORTAB+2,XR1
 118B C2 02 1CF7             529         LA    ANDTAB+2,XR2
 118F 0C 02 15EF 1606        530         MVC   CHECK1,SAMPLE(3)    LOAD SAMPLE COUNT
 1195 38 01 1543             531         TBM   FLAGS2,FLAG14       *CK FOR AND BRANCH TO PRINT GRAPH
 1199 C0 10 13A1             532         BT    DONEXT               *IF SELECTED AFTER TABULAR OUTPUT
 119D 38 40 020D             533         TBM   SBYTE5,SNSW29       *CK FOR AND BRANCH TO SETUP AND PRT-
 11A1 C0 90 13A1             534         BF    DONEXT              *OUT IF NOT RDY AND PRINT MODE 3
                             535 ********************************************************************************
                             536 *       START HERE FOR TABULAR PRINTOUT
                             537 ********************************************************************************
 11A5 0C 01 11EB 1FB9        538         MVC   NOW+3,AMASK2(2)     *
 11AB C0 87 021A             539           B     PRINT
 11AF 43              11AF   540           DC    XL1'43'
 11B0 4F              11B0   541           DC    IL1'79'
 11B1 1592            11B2   542           DC    AL2(LAST)
 11B3 FFFF            11B4   543         DC    XL2'FFFF'
 11B5 0C 01 120C 14D2        544         MVC   FIRST+5,CT11(2)     *INITIALIZE TO MOVE LEFT MOST BIT
 11BB 0C 01 1212 14DA        545         MVC   SECD1+5,CT22(2)      *NAME INTO TABULAR PRINTOUT
 11C1 3C 40 1753             546         MVI   DATA,X'40'
 11C5 0C 56 1752 1753        547         MVC   DATA-1,DATA(87)     CLEAR DATA FIELD
 11CB 0C 07 1753 1575        548         MVC   EXPAND,HISTRY-13(8)  MOVE IN -MICROSEC-
 11D1 3C 60 1743             549         MVI   EXPAND-16,X'60'      MOVE IN DASH
                             550 ********************************************************************************
                             551 *       RETURN HERE AFTER EACH LINE IS FINISHED
                             552 ********************************************************************************
 11D5 C2 01 1AFA             553 NOWCK   LA    ORTAB+2,XR1
 11D9 C2 02 1CF7             554         LA    ANDTAB+2,XR2
 11DD F2 87 08               555         J     NOW
 11E0 C2 01 1AF9             556 NEXT1   LA    ORTAB+1,XR1
 11E4 C2 02 1CF6             557         LA    ANDTAB+1,XR2
 11E8 38 01 0000             558 NOW     TBM   *-*,X'01'           *CK FOR AND BRANCH IF
 11EC C0 90 130A             559         BF    MOD1                 *THIS BIT IS NOT TO BE CHECKED
 11F0 C0 87 021A             560         B     PRINT               *SPACE
 11F4 12              11F4   561         DC    XL1'12'              *ONLY
 11F5 0C 02 15EF 1606        562         MVC   CHECK1,SAMPLE(3)    LOAD SAMPLE COUNT
 11FB 0C 06 15EA 15D1        563         MVC   TIME,D001-1(7)      CLEAR TIME PRINTOUT
 1201 0C 06 1742 15EA        564         MVC   EXPAND-17,TIME(7)
 1207 0C 08 1725 0000        565 FIRST   MVC   EXPAND-46(9),*-*     *MOVE BOTH HALVES OF BIT NAME
 120D 0C 08 1730 0000        566 SECD1   MVC   EXPAND-35(9),*-*     *INTO TABULAR PRINTOUT
 1213 0F 01 120C 15D8        567         SLC   FIRST+5,ELEVEN(2)   *DECREMENT BY 11 TO POINT AT
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1219 0F 01 1212 15D8          568       SLC   SECD1+5,ELEVEN(2)    *NEXT BIT NAME TO THE LEFT
 121F 78 01 03                 569 NOW1  TBM   3(,XR1),X'01'       *CK FOR AND BRANCH IF
 1222 F2 10 23                 570       JT    NOW4                 *BIT IS ON
 1225 78 01 01                 571 NOW5  TBM   1(,XR1),X'01'       *CK FOR AND BRANCH IF
 1228 F2 90 98                 572       JF    TRYNXT               *THIS BIT WAS ON BEFORE
 122B 38 08 1542               573       TBM   FLAGS,FLAG4          *CK FOR AND BRANCH IF
 122F F2 10 0D                 574       JT    SECD                 *FIRST TIME ENTERED
 1232 38 01 1542               575       TBM   FLAGS,FLAG7
 1236 F2 90 30                 576       JF    DOWN1
 1239 0C 08 173A 15C9          577       MVC   EXPAND-25,VARY(9)
 123F 0C 06 174A 15EA          578 SECD  MVC   EXPAND-9,TIME(7)      MOVE SECOND TIME INTO MSG
 1245 F2 87 2D                 579       J     LOGIT
 1248 78 01 01                 580 NOW4  TBM   1(,XR1),X'01'       *CK FOR AND BRANCH IF
 124B F2 10 40                 581       JT    NOW2                 *BIT WAS ON BEFORE
 124E 0C 08 173A 15A7          582       MVC   EXPAND-25,UP(9)      MOVE -WENT DOWN- INTO MSG
 1254 0C 06 1742 15EA          583       MVC   EXPAND-17,TIME(7)    MOVE FIRST TIME INTO MSG
 125A B8 01 03                 584 NOW3  TBM   3(,XR2),X'01'       *CK FOR AND BRANCH IF
 125D F2 10 15                 585       JT    LOGIT                *THE -AND- BIT IS ON
 1260 78 01 05                 586 NOW9  TBM   5(,XR1),X'01'       *CK FOR AND BRANCH IF
 1263 F2 90 0F                 587       JF    LOGIT                *-OR- AFTER NEXT IS ON
 1266 F2 87 5A                 588       J     TRYNXT
 1269 0C 08 173A 15B0          589 DOWN1 MVC   EXPAND-25,DOWN(9)    MOVE -WENT  UP - INTO MSG
 126F 0C 06 1742 15EA          590       MVC   EXPAND-17,TIME(7)    MOVE FIRST TIME INTO MSG
 1275 C0 87 021A               591 LOGIT B     PRINT
 1279 01              1279     592       DC    XL1'01'
 127A 37              127A     593       DC    IL1'55'
 127B 1753            127C     594       DC    AL2(EXPAND)
 127D 3A 02 1542               595       SBM   FLAGS,FLAG6          TURN ON LINE OF DATA PRINTED FLAG
 1281 3B 09 1542               596       SBF   FLAGS,X'09'          TURN OFF FLAGS 4 AND 7
 1285 0C 06 174A 15E3          597       MVC   EXPAND-9,BLANK(7)    CLEAR SECOND TIME AREA
 128B F2 87 35                 598       J     TRYNXT
 128E 38 01 03                 599 NOW2  TBM   3(,XR2),X'01'       *CK FOR AND BRANCH IF
 1291 F2 90 18                 600       JF    NOW7                 *THE -AND- BIT IS ON
 1294 B8 01 01                 601 NOW6  TBM   1(,XR2),X'01'       *CK FOR AND BRANCH IF
 1297 F2 10 29                 602       JT    TRYNXT               *THE PREVIOUS -AND- BIT WAS ON
 129A C0 87 123F               603       B     SECD
 129E 38 08 1542               604 NOW10 TBM   FLAGS,FLAG4         *CK FOR AND BRANCH IF FIRST
 12A2 F2 10 1E                 605       JT    TRYNXT
 12A5 3A 01 1542               606       SBM   FLAGS,FLAG7
 12A9 F2 87 17                 607       J     TRYNXT
 12AC B8 01 01                 608 NOW7  TBM   1(,XR2),X'01'       *CK FOR AND BRANCH IF
 12AF C0 90 129E               609       BF    NOW10                *THE PREVIOUS -AND- BIT WAS DOWN
 12B3 0C 08 173A 15B0          610       MVC   EXPAND-25,DOWN(9)    MOVE -WENT  UP - INTO MSG
 12B9 0C 06 1742 15EA          611       MVC   EXPAND-17,TIME(7)    MOVE FIRST TIME INTO MESSAGE
 12BF 3A 08 1542               612       SBM   FLAGS,FLAG4          TURN ON FIRST TIME ENTERED FLAG
 12C3 D2 01 02                 613 TRYNXT LA   2(,XR1),XR1
 12C6 E2 02 02                 614       LA    2(,XR2),XR2
 12C9 06 24 15EA 156C          615       AZ    TIME(7),HISTRY-22(5) ADD SAMPLE TIME TO COUNTER
 12CF 07 30 15EF 15D2          616       SZ    CHECK1(4),D001(1)    SUBTRACT 1 FROM SAMPLE COUNT
 12D5 C0 01 121F               617       BNZ   NOW1
 12D9 38 02 1542               618       TBM   FLAGS,FLAG6          *CK FOR AND BRANCH IF LINE
 12DD F2 90 07                 619       JF    WILL                 *OF DATA HAS NOT BEEN PRINTED
 12E0 3B 02 1542               620       SBF   FLAGS,FLAG6          TURN OFF LINE OF DATA PRINTED FLAG
 12E4 F2 87 23                 621       J     MOD1
 12E7 0C 01 12EF 1227          622 WILL  MVC   NOW8+2,NOW5+2(2)     *NO CHANGE OF LINE LEVEL HAS
 12ED 78 01 00                 623 NOW8  TBM   *-*(,XR1),X'01'      *BEEN PRINTED, SO CK FOR AND
 12F0 F2 90 09                 624       JF    DOWN2                *BRANCH IF LINE WAS UP
 12F3 0C 07 1739 15B8          625       MVC   EXPAND-26,WASUP(8)
 12F9 F2 87 06                 626       J     COND
 12FC 0C 07 1739 15C0          627 DOWN2 MVC   EXPAND-26,WASDN(8)
 1302 C0 87 021A               628 COND  B     PRINT                *INDICATE THAT THE LINE
 1306 01              1306     629       DC    XL1'01'              *WAS EITHER UP OR
 1307 1D              1307     630       DC    IL1'29'              *DOWN FOR THE
 1308 1739            1309     631       DC    AL2(EXPAND-26)       *WHOLE SAMPLE PERIOD
 130A 0E 00 11E9 11E9          632 MOD1  ALC   NOW4+1(1),NOW4+1      *
 1310 0E 00 1220 1220          633       ALC   NOW5+1(1),NOW5+1      *
 1316 0E 00 128F 128F          634       ALC   NOW2+1(1),NOW2+1      *
 131C 0E 00 125B 125B          635       ALC   NOW3+1(1),NOW3+1      *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1322 0E 00 1249 1249          636       ALC   NOW4+1(1),NOW4+1      *
 1328 0E 00 1226 1226          637       ALC   NOW5+1(1),NOW5+1      *SHIFT ALL MASKS 1 POSITION LEFT
 132E 0E 00 1295 1295          638       ALC   NOW6+1(1),NOW6+1      *
 1334 0E 00 12AD 12AD          639       ALC   NOW7+1(1),NOW7+1      *
 133A 0E 00 1261 1261          640       ALC   NOW9+1(1),NOW9+1
 1340 F2 81 0C                 641       JZ    INIT
 1343 38 10 1543               642       TBM   FLAGS2,FLAG13
 1347 C0 10 11E0               643       BT    NEXT1
 134B C0 87 11D5               644       B     NOWCK
 134F 3C 01 11E9               645 INIT  MVI   NOW4+1,X'01'        *
 1353 3C 01 1220               646       MVI   NOW5+1,X'01'        *
 1357 3C 01 128F               647       MVI   NOW2+1,X'01'        *
 135B 3C 01 125B               648       MVI   NOW3+1,X'01'        *INIT ALL MASKS TO -01-
 135F 3C 01 1249               649       MVI   NOW4+1,X'01'        *
 1353 3C 01 1226               650       MVI   NOW5+1,X'01'        *
 1357 3C 01 1295               651       MVI   NOW6+1,X'01'        *
 136B 3C 01 12AD               652       MVI   NOW7+1,X'01'        *
 136F 3C 01 1261               653       MVI   NOW9+1,X'01'
 1373 38 10 1543               654       TBM   FLAGS2,FLAG13        *CK FOR AND BRANCH IF BOTH
 1377 F2 10 0E                 655       JT    SETUP                *BYTES HAVE BEEN CHECKED
 137A 3A 10 1543               656       SBM   FLAGS2,FLAG13       TURN ON BOTH BYTES CHECKED FLAG
 137E 0C 01 11EB 1FB7          657       MVC   NOW+3,AMASK1(2)      *
 1384 C0 87 11E0               658       B     NEXT1
 1388 C0 87 021A               659 SETUP B     PRINT                *SPACE
 138C 16              138C     660       DC    XL1'16'              *ONLY
 138D 30 00 1615               661       SNS   WORK,X'00'
 1391 39 FF 1615               662       CLI   WORK,X'FF'
 1395 C0 01 0A11               663       BNE   RDCNTR               *GRAPHIC PRINTOUT NOT DESIRED
 1399 3A 08 1543               664       SBM   FLAGS2,FLAG14        TURN ON GRAPHIC DESIRED FLAG
 139D C0 87 117D               665       B     SCOPE
                               666 ********************************************************************
                               667 *     SETUP TO PRINT DATA
                               668 ********************************************************************
 13A1 0C 01 144C 14E2          669 DONEXT MVC   MOVEIT+3,ADATA(2)   *INITIALIZE DATA
 13A7 0C 01 13B0 1FB9          670       MVC   THIS1+3,AMASK2(2)
 13AD 38 01 0000               671 THIS1 TBM   *-*,X'01'            *CK FOR AND BRANCH IF THIS IS
 13B1 F2 10 5D                 672       JT    CKORS1               *ONE OF THE BITS TO BE CHECKED
 13B4 0E 00 13AE 13AE          673 MODIFY ALC  THIS1+1(1),THIS1+1   *SHIFT ALL
 13BA 0E 00 1418 1418          674       ALC   CKORS+1(1),CKORS+1   *MASK BITS
 13C0 0E 00 141E 141E          675       ALC   B4+1(1),B4+1          *ONE POSITION
 13C6 0E 00 142B 142B          676       ALC   CKB4+1(1),CKB4+1      *TO THE
 13CC 0E 00 1431 1431          677       ALC   CKAND+1(1),CKAND+1    *LEFT
 13D2 0E 00 1437 1437          678       ALC   ANDCK+1(1),ANDCK+1
 13D8 C0 01 13AD               679       BNZ   THIS1
 13DC 3C 01 13AE               680       MVI   THIS1+1,X'01'        *INITIALIZE
 13E0 3C 01 1418               681       MVI   CKORS+1,X'01'         *ALL
 13E4 3C 01 141E               682       MVI   B4+1,X'01'             *MASKS
 13E8 3C 01 1431               683       MVI   CKAND+1,X'01'           *TO
 13EC 3C 01 142B               684       MVI   CKB4+1,X'01'             *ONE
 13F0 3C 01 1437               685       MVI   ANDCK+1,X'01'
 13F4 38 80 1543               686       TBM   FLAGS2,FLAG10        *CK FOR AND BRANCH IF BOTH
 13F8 F2 10 5E                 687       JT    DONE1                *BITES HAVE BEEN CHECKED
 13FB 3A 80 1543               688       SBM   FLAGS2,FLAG10        TURN ON BOTH BYTES CHECKED FLAG
 13FF 0C 01 13B0 1FB7          689       MVC   THIS1+3,AMASK1(2)
 1405 36 01 15F1               690       A     FFFF,XR1
 1409 36 02 15F1               691       A     FFFF,XR2
 140D C0 87 13AD               692       B     THIS1                GO CHECK BYTE 1
 1411 0C 0A 159D 159E          693 CKORS1 MVC   SETPRT,SETPRT+1(11)  CLEAR PRINT SETUP AREA
 1417 78 01 03                 694 CKORS TBM   3(,XR1),X'01'        *CK FOR AND BRANCH IF -OR-
 141A F2 10 0D                 695       JT    CKB4                 *BIT IS ON
 141D 78 01 01                 696 B4    TBM   1(,XR1),X'01'        *CK FOR AND BRANCH IF PREVIOUS
 1420 F2 10 20                 697       JT    TIMEUP               * -OR- BIT WAS ON
 1423 3C F1 159B               698       MVI   SETPRT-2,X'F1'       SETUP DOWN CONDITION PRINTOUT
 1427 F2 87 1F                 699       J     MOVEIT
 142A 78 01 01                 700 CKB4  TBM   1(,XR1),X'01'        *CK FOR AND BRANCH IF PREVIOU
 142D F2 90 13                 701       JF    TIMEUP               *BIT IS OFF
 1430 B8 01 03                 702 CKAND TBM   3(,XR2),X'01'        *CK FOR AND BRANCH
 1433 F2 90 0D                 703       JF    TIMEUP               *IF NOT ALWAYS UP
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1436 B8 01 01                704 ANDCK  TBN   1(,XR2),X'01'      *CK FOR AND BRANCH IF
 1439 F2 90 07                705        JF    TIMEUP             *PREVIOUS -AND- BIT NOT ON
 143C 3C F1 1595              706        MVI   SETPRT-8,X'F1'     SETUP UP CONDITION PRINTOUT
 1440 F2 87 06                707        J     MOVEIT
 1443 0C 06 159B 15EA         708 TIMEUP MVC   SETPRT-2,TIME(7)   MOVE TIME PRINTOUT INTO PRINT AREA
 1449 0C 0A 0000 159D         709 MOVEIT MVC   *-*,SETPRT(11)     MOVE THIS BIT INFO INTO PRINT AREA
 144F 0F 01 144C 15D8         710        SLC   MOVEIT+3,ELEVEN(2)  DECREMENT PRINT AREA ADDRESS
 1455 C0 87 13B4              711        B     MODIFY
 1459 3B 80 1543              712 DONE1  SBF   FLAGS2,FLAG10      TURN OFF FLAG 10
 145D D2 01 03                713        LA    3(,XR1),XR1
 1460 E2 02 03                714        LA    3(,XR2),XR2
 1463 0E 00 1756 15F4         715        ALC   LINECT(1),ONE       INCREMENT LIMITS LINE COUNT
 1469 34 01 1615              716        ST    WORK,XR1            SAVE XR1
 146D 34 02 1613              717        ST    WORK-2,XR2          SAVE XR2
 1471 C2 01 16D2              718        LA    LIMITS,XR1          LOAD ADDRESS OF LIMITS TABLE
 1475 C2 02 175D              719 RAY02  LA    DATA+10,XR2         PRINT AREA FOR ASTERISK
 1479 7D FF 00                720 RAY05  CLI   0(,XR1),X'FF'      LOOK FOR SENSE BIT SEPARATOR
 147C F2 81 1F                721        JE    RAY20               GO TO NEXT BIT INFO
 147F 7D FE 00                722        CLI   0(,XR1),X'FE'       LOOK FOR END OF INFO
 1482 F2 81 23                723        JE    RAY30               GO TO END
 1485 4D 00 00 1756           724        CLC   0(,XR1),LINECT(1)   SEE IF LINE IS WITHIN LOWER LIMIT
 148A F2 84 0B                725        JH    RAY10               GO ON IF NOT
 148D 4D 00 01 1756           726        CLC   1(,XR1),LINECT(1)   SEE IF LINE IS WITHIN UPPER LIMIT
 1492 F2 82 03                727        JL    RAY10               GO ON IF NOT
 1495 BC 5C 00                728        MVI   0(,XR2),X'5C'       PUT ASTERISK IN PRINT AREA
 1498 D2 01 02                729 RAY10  LA    2(,XR1),XR1         INCREMENT LIMIT TABLE ADDRESS
 149B F2 87 06                730        J     RAY25               JUMP TO BRANCH BACK
 149E D2 01 01                731 RAY20  LA    1(,XR1),XR1         INCREMENT LIMIT TABLE ADDRESS
 14A1 E2 02 0B                732        LA    11(,XR2),XR2        INCREMENT PRINT ADDRESS
 14A4 C0 87 1479              733 RAY25  B     RAY05               RELOOP
 14A8 35 01 1615              734 RAY30  L     WORK,XR1            RESTORE XR1
 14AC 35 02 1613              735        L     WORK-2,XR2          RESTORE XR2
 14B0 06 24 15EA 156C         736        AZ    TIME(7),HISTRY-22(5) ADD SAMPLE TIME TO COUNTER
 14B6 38 20 1543              737        TBN   FLAGS2,FLAG12        *CK FOR AND BRANCH IF HEADING
 14BA F2 10 1E                738        JT    LINE                *HAS BEEN PRINTED
 14BD 3A 20 1543              739        SBN   FLAGS2,FLAG12       TURN ON HEADING PRINTED FLAG
 14C1 C0 87 021A              740        B     PRINT               *PRINT
 14C5 43                14C5  741        DC    XL1'43'              *HEADING
 14C6 4F                14C6  742        DC    IL1'79'               *
 14C7 1592              14C8  743        DC    AL2(LAST)              *
 14C9 FFFF              14CA  744        DC    XL2'FFFF'               *
 14CB C0 87 021A              745        B     PRINT               *PRINT FIRST
 14CF 01                14CF  746        DC    XL1'01'              *LINE OF
 14D0 58                14D0  747 CT1      DC    IL1'88'               *LINE
 14D1 1677              14D2  748 CT11     DC    AL2(LINE1)             *NAMES
 14D3 C0 87 021A              749        B     PRINT               *PRINT SECOND
 14D7 02                14D7  750        DC    XL1'02'              *LINE OF
 14D8 58                14D8  751 CT2      DC    IL1'88'               *LINE
 14D9 16CF              14DA  752 CT22     DC    AL2(LINE2)             *NAMES
 14DB C0 87 021A              753 LINE   B     PRINT               *PRINT
 14DF 01                14DF  754        DC    XL1'01'              *A LINE
 14E0 58                14E0  755 CT3      DC    IL1'88'               *OF
 14E1 1753              14E2  756 ADATA    DC    AL2(DATA)              *DATA
 14E3 07 21 15EF 15D2         757        SZ    CHECK1(4),D001(2)
 14E9 C0 01 13A1              758        BNZ   DONEXT
 14ED C0 87 021A              759        B     PRINT               *SPACE
 14F1 16                14F1  760        DC    XL1'16'              *ONLY
 14F2 C0 87 0A11              761        B     RDCNTR
                              762 ********************************************************************
                              763 *      SETUP1
                              764 ********************************************************************
                              765 *      SUBROUTINE TO SAVE THE SENSE DATA
                              766 ********************************************************************
 14F6 34 08 1541              767 SETUP1 ST    GETOUT+3,ARR        SAVE THE ARR FOR SUBROUTINE EXIT
 14FA 1C 00 1500 00           768 OVER   MVC   OR+1,*-*(1,XR1)     MOVE BYTE OF DATA INTO MASK
 14FF BA 00 00                769 OR     SBN   0(,XR2),X'00'       -OR- DATA INTO ALL ZERO TABLE
 1502 36 02 1F7F              770        A     D509,XR2            ADD 509 TO XR2
 1506 1F 00 15DC 00           771 COMP   SLC   SAVEF,*-*(1,XR1)    COMPLEMENT DATA
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 150B 0C 00 1512 15DC         772        MVC   AND+1(1),SAVEF      MOVE COMPLEMENTED DATA INTO MASK
 1511 BB 00 00                773 AND    SBF   0(,XR2),X'00'       -AND- DATA INTO ALL ONES TABLE
 1514 3C FF 15DC              774        MVI   SAVEF,X'FF'         RE-ENITIALIZE
 1518 36 02 15FA              775        A     D508,XR2            SUBTRACT 508 FOR NEXT -OR- TABLE ADD
 151C 1C 00 1522 01           776 OVER22 MVC   OR22+1,1(1,XR1)     MOVE BYTE OF DATA INTO MASK
 1521 BA 00 00                777 OR22   SBN   0(,XR2),X'00'       -OR- DATA INTO ALL ZERO TABLE
 1524 36 02 1F7F              778        A     D509,XR2            ADD 509 TO XR2
 1528 1F 00 15DC 01           779 COMP22 SLC   SAVEF,1(1,XR1)      COMPLEMENT DATA
 152D 0C 00 1534 15DC         780        MVC   AND22+1(1),SAVEF    MOVE COMPLEMENTED DATA INTO MASK
 1533 BB 00 00                781 AND22  SBF   0(,XR2),X'00'       -AND- DATA INTO ALL ONES TABLE
 1536 3C FF 15DC              782        MVI   SAVEF,X'FF'         RE-ENITIALIZE
 153A 36 02 15FA              783        A     D508,XR2            SUBTRACT 508 FOR NEXT -OR- TABLE ADD
 153E C0 87 0000              784 GETOUT B     *-*
                              785 *
                              786 ********************************************************************
                              787 *      PROGRAM INDICATOR FLAGS
                              788 ********************************************************************
 1542 00                1542  789 FLAGS  DC    XL1'0'
                              790 * FLAG0      BIT 0-
                              791 * FLAG1      BIT 1-HALT AFTER LAST CONTROL CARD
                              792 * FLAG2      BIT 2-
                              793 * FLAG3      BIT 3-FIRST SAMPLE CMND EXECUTED FOR PRIME
                              794 * FLAG4      BIT 4-FIRST TIME HAS BEEN ENTERED IN TABULAR TABLE
                              795 * FLAG5      BIT 5-
                              796 * FLAG6      BIT 6-A LINE OF DATA HAS BEEN PRINTED
                              797 * FLAG7      BIT 7-
                              798 *
 1543 00                1543  799 FLAGS2 DC    XL1'0'
                              800 * FLAG10     BIT 0-BYTES 1 AND 2 HAVE BEEN CHECKED
                              801 * FLAG11     BIT 1-SYNC-SAMP WANTED
                              802 * FLAG12     BIT 2-HEADING HAS BEEN PRINTED
                              803 * FLAG13     BIT 3-
                              804 * FLAG14     BIT 4-
                              805 * FLAG15     BIT 5-
                              806 * FLAG16     BIT 6-
                              807 * FLAG17     BIT 7-
                              808 ********************************************************************
                              809 *      MESSAGES
                              810 ********************************************************************
 1544 40404040          1547  811 MANY   DC    CL4'    '
 1548 4040404040404040  1556  812 CMND   DC    CL15'               '
 1550 4040404040404040
 1557 40C3D4D5C4E240E2  1582  813 HISTRY DC    CL44' CMNDS SAMPLED - 00000 MICROSEC SAMPLE TIME.'
 155F C1D4D7D3C5C44060
 1567 40F0F0F0F0F040D4
 156F C9C3D9D6E2C5C340
 1577 E2C1D4D7D3C540E3
 157F C9D4C54B
 1583 4040D3C1E2E340C3  1592  814 LAST   DC    CL16'  LAST CMND     '
 158B D4D5C44040404040        814
 1593 4040404040404040  159D  815 SETPRT DC    CL11'            '     AREA IN WHICH TO SETUP PRINT INFO
 159B 404040                  815
 159E 40                159E  816        DC    CL1' '
 159F E6C5D5E340C4D6E6  15A7  817 UP     DC    CL9'WENT DOWN'
 15A7 D5                      817
 15A8 E6C5D5E3404040E4D7 15B0 818 DOWN   DC    CL9'WENT  UP '
 15B0 40                      818
 15B1 E6C1E240C4D6E6D5  15B8  819 WASUP  DC    CL8'WAS DOWN'
 15B9 E6C1E24040E4D740  15C0  820 WASDN  DC    CL8'WAS  UP '
 15C1 40E5C1D9C9C1C2D3  15C9  821 VARY   DC    CL9' VARIABLE'
 15C9 C5                      821
                              822 ********************************************************************
                              823 *      CONSTANTS
                              824 ********************************************************************
 15CA F5F0              15CB  825 D50    DC    DL2'50'
 15CC F0F0F0F0F0F0F0F1  15D2  826 D001   DC    DL7'0000001'
 15D3 F1F0              15D4  827 F1F0   DC    DL2'10'
 15D5 000A              15D6  828 TEN    DC    XL2'000A'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   15D7 000B             15D8  829 ELEVEN DC    XL2'000B'
   15D9 19B3             15DA  830 D6579  DC    IL2'6579'
   15DB FFFF             15DC  831 SAVEF  DC    XL2'FFFF'
   15DD 40404040404040   15E3  832 BLANK  DC    CL7'       '
   15E4 40404040404040   15EA  833 TIME   DC    CL7'       '
   15EB 4040404040       15EF  834 CHECK1 DC    CL5'     '          NUMBER OF SAMPLES
   15F0 FFFF             15F1  835 FFFF   DC    XL2'FFFF'
   15F2 0000             15F3  836 ZERO   DC    XL2'0'
   15F4 01               15F4  837 ONE    DC    XL1'01'
   15F5 C0 87 0E8D             838 NOT1   B     KBTST
   15F9 FE04             15FA  839 D508   DC    XL2'FE04'
   15FB F0F0F2           15FD  840 D002   DC    DL3'002'
   15FE 2380             15FF  841 TWO380 DC    XL2'2380'
   1600 000000           1602  842 DELAY  DC    XL3'000'
   1603 30               1603  843 FL     DC    XL1'30'
                               844 ********************************************************************************
                               845 *      RESERVED STORAGE AREA
                               846 ********************************************************************************
   1604                  1606  847 SAMPLE DS    CL3                NUMBER OF SAMPLES TO BE TAKEN
   1607                  1609  848 NUMBER DS    CL3
   160A                  1615  849 WORK   DS    CL12
   1616                  1619  850 DELAY1 DS    CL4
   161A                  161D  851 DELAY2 DS    CL4
   161E                  1621  852 DELAY3 DS    CL4
   1622                  1677  853 LINE1  DS    CL86
   1678                  1679  854       DS    CL2
   167A                  16CF  855 LINE2  DS    CL86
   16D0                  16D1  856       DS    CL2
                         16D2  857 LIMITS EQU   *
   16D2                  16FB  858       DS    CL42
                         16FC  859 DATFLD EQU   *
   16FC                  1AF7  860       DS    4CL255
                         1AF8  861 ORTAB  EQU   *
   1AF8                  1CF1  862       DS    2CL253
   1CF2                  1CF2  863       DS    CL1
   1CF3                  1CF4  864 SS     DS    CL2                SYNC-SAMP COUNT AREA
                         1CF5  865 ANDTAB EQU   *
   1CF5                  1EEE  866       DS    2CL253
   1EEF                  1EEF  867       DS    CL1
                               868
                               868
   1F00                        869       ORG   X'1F00'
                         1F00  870 RDFD   EQU   *
   1F00                  1F5F  871       DS    CL96
                         1F60  872 CMNDS  EQU   *                  *COMMAND AND/OR
   1F60                  1F6F  873       DS    CL16                *DELAY TABLE
   1F70                  1F70  874 MASK1  DS    CL1
   1F71                  1F71  875 MASK2  DS    CL1
   1F72                  1F75  876 MULT   DS    CL4
   1F76                  1F79  877 PASSES DS    CL4                SPECIFIED NUMBER OF SAMPLINGS
   1F7A                  1F7D  878 TIMES  DS    CL4
   1F7E 01FD             1F7F  879 D509   DC    IL2'509'
                               880 ********************************************************************************
                               881 *      THIS AREA CONTAINS DATA WHICH WILL ONLY BE USED WITH PRINTER TAP
                               882 ********************************************************************************
   1F80 0C 01 0E75 1FA1        883 LDPRNT MVC   LET3+3,FORM(2)       MUST BE AT ADDR -1F80-
   1F86 0C 01 0E84 1FA5        884       MVC   LET4+3,IMAGE(2)
   1F8C 0C 01 0E88 1FA3        885       MVC   LET5+3,PTAREA(2)
   1F92 0C 03 0E8C 1FAD        886       MVC   TIOTWO+3,PRTBSY+3(4)
   1F98 3C 0D 0E2F             887       MVI   MAYBE,X'0D'
   1F9C C0 87 0B48             888       B     LDTHEN
   1FA0 15BD             1FA1  889 FORM   DC    AL2(WASDN-3)
   1FA2 1FA7             1FA3  890 PTAREA DC    AL2(ATE7C)
   1FA4 1FA9             1FA5  891 IMAGE  DC    AL2(ATE00)
   1FA6 087C             1FA7  892 ATE7C  DC    XL2'87C'
   1FA8 0800             1FA9  893 ATE00  DC    XL2'800'
   1FAA C1 E6 0E89             894 PRTBSY TIO   TIOTWO,X'E6'
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1FAE 1F00             1FAF  898 LDRD   DC    AL2(RDFD)
   1FB0 1621             1FB1  899 ALINE1 DC    AL2(LINE1-86)
   1FB2 1679             1FB3  900 ALINE2 DC    AL2(LINE2-86)
   1FB4 113F             1FB5  901 AHOW   DC    AL2(HOW)
   1FB6 1F70             1FB7  902 AMASK1 DC    AL2(MASK1)
   1FB8 1F71             1FB9  903 AMASK2 DC    AL2(MASK2)
   1FBA 0F3B             1FBB  904 ATIO   DC    AL2(TIOCBD)
   1FBC 1107             1FBD  905 AERROR DC    AL2(ERROR)
   1FBE CF8C             1FBF  906 ANOWT  DC    AL2(NOWAIT)
   1FC0 175D             1FC1  907 DATA1  DC    AL2(DATA+10)
   1FC2 1603             1FC3  908 AFL    DC    AL2(FL)
                               909 ********************************************************************************
                               910 *      THIS AREA CONTAINS DATA WHICH WILL ONLY BE USED WITH A DISK TAP
                               911 ********************************************************************************
   1FC4                  1FC4  912 BDISK  EQU   *
   1FC7                  1FC7  913 DISK   DS    CL4
   1FC8                  1FC8  914 BACK   DS    CL1
   1FC9                  1FC9  915 OPISIT DS    CL1
   1FCA 0C 03 1FC7 1714        916 LDDISK MVC   DISK,DATFLD+24(4)
   1FD0 0C 01 0E88 1FED        917       MVC   LET5+3,CDISK(2)
   1FD6 0C 00 1FC9 1726        918       MVC   OPISIT,DATFLD+42(1)
   1FDC 0C 00 1FC8 1713        919       MVC   BACK,DATFLD+23(1)
   1FE2 08 03 0E95 1F23        920       MVN   TIOONE+1,RDFD+35          FIX FOR 101d
   1FE8 C0 87 0B48             921       B     LDTHEN
   1FEC 1FEF             1FED  922 CDISK  DC    AL2(ADISK)
   1FEE 1FC4             1FEF  923 ADISK  DC    AL2(BDISK)
                               924 ********************************************************************************
                               925 *      EQUATES
                               926 ********************************************************************************
   0001                        927 XR1    EQU   1
   0002                        928 XR2    EQU   2
   0008                        929 ARR    EQU   X'08'
   020D                        930 SBYTE5 EQU   X'20D'
   021A                        931 PRINT  EQU   X'21A'
   021E                        932 UNPACK EQU   X'21E'
   0222                        933 HALT   EQU   X'222'
   0226                        934 PACK   EQU   X'226'
   022A                        935 LOAD   EQU   X'22A'
   0232                        936 UTAB   EQU   X'232'
   0080                        937 SNSW28 EQU   X'80'
   0040                        938 SNSW29 EQU   X'40'
   0020                        939 SNSW2A EQU   X'20'
   0010                        940 SNSW2B EQU   X'10'
   0040                        941 FLAG1  EQU   X'40'
   0010                        942 FLAG3  EQU   X'10'
   0008                        943 FLAG4  EQU   X'08'
   0002                        944 FLAG6  EQU   X'02'
   0001                        945 FLAG7  EQU   X'01'
   0080                        946 FLAG10 EQU   X'80'
   0040                        947 FLAG11 EQU   X'40'
   0020                        948 FLAG12 EQU   X'20'
   0010                        949 FLAG13 EQU   X'10'
   0008                        950 FLAG14 EQU   X'08'
   0004                        951 FLAG15 EQU   X'04'
   1753                        952 EXPAND EQU   DATFLD+87
   1753                        953 DATA   EQU   DATFLD+87
   1756                        954 LINECT EQU   DATFLD+90
   0010                        955 KEYBRD EQU   X'10'          DEV ADDR OF KEYBOARD AND 2956
                               956       TREP
                               957 *  SSWS 28 - PRINT ONLY LAST SAMPLE INFORMATION ON STATUS ERROR OR NOT
                               958 * READY.
                               959       TREP
                               960 *  SSWS 29 - PRINTOUT IN TABULAR FORM.
                               961       TREP
                               962 *  SSWS 2B - BYPASS INITIAL NON-SAMPLE EXECUTION OF SAMPLE COMMAND
```

FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          963 * -MPCU-
                          964       TREP
                          965 *  F9 HALT - SAMPLING WAS NOT PERFORMED DUE TO AN ERROR.
                          966       TREP
                          967 *  FE HALT - IF SPECIFIED IN M2, TO ALLOW CE INTERVENTION BEFORE TEST
                          968 * IS PERFORMED.
                          969       TREP
                          970 *  FF HALT - THE PROGRAM IS NOW READY TO HAVE A -TAP- LOADED.
                          971       TREP
                          972 *  -FF- IN THE DATA SWITCHES PRIOR TO THE COMPLETION OF THE TABULAR
                          973 * PRINTOUT.
                          974       TREP
                          975 *       WILL CAUSE A SCOPE TYPE PRINTOUT OF THE SAME DATA.
                          976       TREP
                          977 *  -AA- IN THE LEFT ADDRESS SWITCHES, WHEN THE -FF- OR -F9- HALT IS
                          978 * RESET, WILL CAUSE
                          979       TREP
                          980 *       A RE-EXECUTION OF THE PREVIOUSLY LOADED TAP.
                          981       TREP
                          982 *  THE INDICATED UP OR DOWN CONDITION REFERS TO THE LOGIC LEVEL, NOT
                          983 * THE BIT CONDITION.
                          984       TREP
                          985 *  -TAP- DECKS WILL BE LOADED FROM THE PRIMARY HOPPER.
                    FFFF  986       END
```


FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
AA1	A	003	1029	0440	0232*
AA10	A	003	10F0	0490	0241*
AA2	A	003	1040	0446	0233*
AA3	A	003	1059	0452	0234*
AA4	A	003	1070	0458	0235*
AA5	A	003	1087	0464	0236*
AA6	A	003	109F	0470	0237*
AA7	A	003	10B6	0476	0238*
AA8	A	003	10CA	0481	0239* 0485
AA9	A	003	10DF	0486	0240*
ADATA	A	002	14E2	0756	0669
ADD	A	003	1064	0455	0450*
ADISK	A	002	1FEF	0923	0922
AERROR	A	002	1FBD	0905	0511
AFL	A	002	1FC3	0908	0130
AHOW	A	002	1FB5	0901	0508
ALINE1	A	002	1FB1	0899	0259
ALINE2	A	002	1FB3	0900	0260
ALLIN	A	006	1120	0502	0499
ALLOUT	A	006	1145	0512	0503 0507
AMASK1	A	002	1FB7	0902	0279 0657 0689
AMASK2	A	002	1FB9	0903	0264 0538 0670
AND	A	003	1511	0773	0772*
ANDCK	A	003	1436	0704	0678 0678* 0685*
ANDTAB	A	001	1CF5	0865	0033* 0303 0303* 0304 0304* 0513 0513* 0529 0554 0557
AND22	A	003	1533	0781	0780*
AND33	A	003	1098	0468	0467*
ANDWT	A	002	1FBF	0906	0254
ARR	C	001	0008	0929	0767
ATE00	A	002	1FA9	0893	0891
ATE7C	A	002	1FA7	0892	0890
ATIO	A	002	1FBB	0904	0153
BACK	A	001	1FC8	0914	0346 0919*
BACK1	A	004	0F88	0391	0156
BACK2	A	004	0F68	0381	0144
BACK3	A	004	0F48	0371	0139
BB1	A	005	102C	0441	0242*
BB10	A	005	10F3	0491	0251*
BB2	A	005	1043	0447	0243*
BB3	A	005	105C	0453	0244*
BB4	A	005	1073	0459	0245*
BB5	A	005	108A	0465	0246*
BB6	A	005	10A2	0471	0247*
BB7	A	005	10B9	0477	0248*
BB8	A	005	10CD	0482	0249*
BB9	A	005	10E2	0487	0250*
BDISK	A	001	1FC4	0912	0923
BLANK	A	007	15E3	0832	0030 0031 0124 0134 0142 0160 0169 0190 0192 0252 0285 0514 0597
BYPASS	A	004	0E46	0298	0294
B4	A	003	141D	0696	0675 0675* 0682*
CARD	A	004	0A90	0068	0054
CARD2	A	004	0AE6	0106	0069
CARD4	A	004	0AA7	0078	0071
CARD5	A	004	0AD1	0096	0085
CAT	A	004	1164	0519	0515
CC1	A	003	1031	0442	0441*
CC10	A	003	10F8	0492	0491*
CC2	A	003	1048	0448	0447*
CC3	A	003	1061	0454	0453*
CC4	A	003	1078	0460	0459*
CC5	A	003	108F	0466	0465*
CC6	A	003	10A7	0472	0471*
CC7	A	003	10BE	0478	0477*
CC8	A	003	10D2	0483	0482*
CC9	A	003	10E7	0488	0487*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
CDISK	A	002	1FED	0922	0917
CHECK1	A	005	15EF	0834	0353* 0406* 0410* 0413* 0428* 0489* 0530* 0562* 0616* 0757*
CKAND	A	003	1430	0702	0677 0677* 0683*
CKB4	A	003	142A	0700	0676 0676* 0684* 0695
CKFE	A	004	0AC0	0088	0036
CKORS	A	003	1417	0694	0674 0674* 0681*
CKORS1	A	006	1411	0693	0672
CKO	A	004	0ACD	0092	0089
CK41	A	006	0BB8	0156	0151
CK411	A	004	0BA2	0150	0143
CK42	A	006	0B7E	0142	0135
CLCCOM	A	005	0E98	0317	0315
CLEAR	A	006	0BD0	0160	0154
CMND	A	015	1556	0812	0066*
CMNDS	A	001	1F60	0872	0065 0305
COMP	A	005	1506	0771	0178*
COMP22	A	005	1528	0779	0184*
COMP3	A	005	104B	0449	0180*
COMP33	A	005	1082	0463	0186*
COND	A	004	1302	0628	0626
COM	A	004	0A17	0029	0518
CT1	A	001	14D0	0747	0261* 0269*
CT11	A	002	14D2	0748	0259* 0267* 0544
CT2	A	001	14D8	0751	0262* 0270*
CT22	A	002	14DA	0752	0260* 0268* 0545
CT3	A	001	14E0	0755	0263* 0271*
DA	A	002	0A53	0044	0041*
DATA	A	001	1753	0953	0546* 0547 0547* 0719 0756 0907
DATA1	A	002	1FC1	0907	0111
DATFLD	A	001	16FC	0859	0120 0126 0127 0131 0132 0133 0137 0138 0146 0147 0152 0158 0159 0164 0165 0166 0167 0171* 0172 0172* 0173 0174 0175 0176 0177 0178 0179 0180 0181* 0182 0183 0184 0185 0186 0187 0194 0198 0199 0207 0208 0215 0354 0408 0916 0918 0919 0952 0953 0954
DD1	A	003	1020	0438	0230* 0437*
DELAY	A	003	1602	0842	0326* 0332*
DELAY1	A	004	1619	0850	0157* 0224 0393
DELAY2	A	004	161D	0851	0145* 0382
DELAY3	A	004	1621	0852	0136* 0372
DELAY7	A	006	0EB4	0326	0328
DIAG	A	004	112D	0506	0313 0316
DISK	A	004	1FC7	0913	0339* 0346* 0916*
DLY1	A	004	0EC8	0330	0331
DONEXT	A	006	13A1	0669	0532 0534 0758
DONE1	A	004	1459	0712	0687
DOWN	A	009	15B0	0818	0589 0610
DOWN1	A	006	1269	0589	0576
DOWN2	A	006	12FC	0627	0624
D001	A	007	15D2	0826	0162 0224 0327 0358 0373 0383 0394 0406 0413 0421 0424 0428 0484 0489 0500 0502 0526 0563 0616 0757
D002	A	003	15FD	0840	0223
D50	A	002	15CB	0825	0161
D508	A	002	15FA	0839	0456 0474 0775 0783
D509	A	002	1F7F	0879	0445 0462 0770 0778
D6579	A	002	15DA	0830	0329
ELEVEN	A	002	15D8	0829	0267 0268 0269 0270 0271 0272 0567 0568 0710
ERROR	A	004	1107	0496	0415 0905
EXPAND	A	001	1753	0952	0548* 0549* 0564* 0565* 0566* 0577* 0578* 0582* 0583* 0589* 0590* 0594 0597* 0610* 0611* 0625* 0627* 0631
FFFF	A	002	15F1	0835	0330 0690 0691
FP48	A	001	0A00	0005	
FIFTY1	A	006	0C9B	0198	0191
FIFTY2	A	006	0CB6	0207	0193
FINSH1	A	004	10DB	0485	0480
FIRST	A	006	1207	0565	0544* 0567*
FIRST1	A	004	0A7E	0062	0059

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
FIX	A	006	0CE9	0221	0181 0196 0202 0205 0211 0214 0218
FL	A	001	1603	0843	0908
FLAGS	A	001	1542	0789	0088 0255* 0258* 0284* 0348 0350* 0573 0575 0595* 0596* 0604 0606* 0612* 0618 0620*
FLAGS2	A	001	1543	0799	0029* 0112* 0115* 0276 0278* 0498 0531 0642 0654 0656* 0664* 0686 0688* 0712* 0737 0739*
FLAG1	C	001	0040	0941	0088 0255 0258
FLAG10	C	001	0080	0946	0686 0688 0712
FLAG11	C	001	0040	0947	0115 0498
FLAG12	C	001	0020	0948	0737 0739
FLAG13	C	001	0010	0949	0642 0654 0656
FLAG14	C	001	0008	0950	0531 0664
FLAG15	C	001	0004	0951	0112 0276 0278
FLAG3	C	001	0010	0942	0348 0350
FLAG4	C	001	0008	0943	0573 0604 0612
FLAG6	C	001	0002	0944	0595 0618 0620
FLAG7	C	001	0001	0945	0575 0606
FORM	A	002	1FA1	0889	0883
F1F0	A	002	15D4	0827	0479
GETON	A	006	0D11	0230	0227
GETOUT	A	004	153E	0784	0767*
HALT	C	001	0222	0933	0027 0060 0090 0108 0516
HISTRY	A	044	1582	0813	0160* 0161* 0548 0615 0736
HOW	A	006	113F	0511	0901
IMAGE	A	002	1FA5	0891	0884
INIT	A	004	134F	0645	0641
INIT2	A	003	0E4A	0299	0296
ISMFCU	A	004	0E38	0293	0288
JUMPIT	A	006	0CE3	0220	0216
KBTST	A	006	0E8D	0314	0838
KEYBRD	C	001	0010	0955	
LAST	A	016	1592	0814	0522 0542 0743
LATER	A	006	0DA7	0259	0257
LDDISK	A	006	1FCA	0916	0125
LDPRNT	A	006	1F80	0883	0123
LDRD	A	002	1FAF	0898	0307 0311 0312
LDTHEM	A	006	0B48	0131	0128 0888 0921
LEFT1	A	004	0CAF	0204	0200
LEFT2	A	004	0CCA	0213	0209
LETS	A	006	0E50	0301	0291 0497
LETSGO	A	004	0E14	0284	0092
LET3	A	004	0E72	0307	0131* 0308 0310* 0342 0883*
LET4	A	004	0E81	0311	0130* 0132* 0309 0884*
LET5	A	004	0E85	0312	0133* 0885* 0917*
LIMITS	A	001	16D2	0857	0101 0718
LINE	A	004	14DB	0753	0738
LINECT	A	001	1756	0954	0527* 0715* 0724 0726
LINE1	A	086	1677	0853	0030* 0076* 0748 0899
LINE2	A	086	16CF	0855	0031* 0083* 0752 0900
LOAD	C	001	022A	0935	0042 0046
LOGIT	A	004	1275	0591	0579 0585 0587
MANY	A	004	1547	0811	0285* 0358* 0514
MASK1	A	001	1F70	0874	0176* 0902
MASK2	A	001	1F71	0875	0182* 0903
MAYBE	A	006	0E2F	0290	0887*
MODIFY	A	006	13B4	0673	0711
MOD1	A	006	130A	0632	0559 0621
MOVEIT	A	006	1449	0709	0669* 0699 0707 0710*
MULT	A	004	1F75	0876	0110* 0306 0427 0439
NEVER	A	004	0AB4	0084	0067 0077 0079
NEXTCD	A	004	0E68	0305	0351 0504
NEXTN	A	004	0A57	0046	0040 0097 0102 0277
NEXT1	A	004	11E0	0556	0643 0658
NODLAY	A	005	0EE1	0337	0320
NOT1	A	004	15F5	0838	0290
NOW	A	004	11E8	0558	0538* 0555 0632 0632* 0645* 0657*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
NOWAIT	A	004	0F8C	0392	0226* 0229* 0906
NOWCK	A	004	11D5	0553	0644
NOWDO	A	004	0FBD	0408	0430 0509
NOW1	A	003	121F	0569	0617 0633 0633* 0646*
NOW10	A	004	129E	0604	0609
NOW2	A	003	128E	0599	0581 0634 0634* 0647*
NOW3	A	003	125A	0584	0635 0635* 0648*
NOW4	A	003	1248	0580	0570 0636 0636* 0649*
NOW5	A	003	1225	0571	0622 0637 0637* 0650*
NOW6	A	003	1294	0601	0638 0638* 0651*
NOW7	A	003	12AC	0608	0500 0639 0639* 0652*
NOW8	A	003	12ED	0623	0622*
NOW9	A	003	1260	0586	0640 0640* 0653*
NUMBER	A	003	1609	0848	0222* 0223* 0353 0410
ONE	A	001	15F4	0837	0215 0326 0332 0524 0715
ONLY1	A	003	0F12	0349	0289* 0295* 0298*
OO	A	003	1039	0444	0443*
OPISIT	A	001	1FC9	0915	0339 0918*
OR	A	003	14FF	0769	0768*
ORIGIN	A	004	0D0D	0229	0225
ORTAB	A	001	1AF8	0861	0032* 0301 0301* 0302 0302* 0355 0409 0512 0512* 0528 0553 0556
OB22	A	003	1521	0777	0776*
OB33	A	003	107B	0461	0457*
OUT2	A	004	0FDC	0415	0508* 0511*
OVER	A	005	14FA	0768	0177*
OVER22	A	005	151C	0776	0183*
OVER3	A	005	1034	0443	0179*
OVER33	A	005	106B	0457	0185*
PACK	C	001	0226	0934	0062 0098 0117
PACKIT	A	004	0B14	0117	0114
PACK1	A	006	0BBE	0157	0148
PASSES	A	004	1F79	0877	0286* 0502*
PRINT	C	001	021A	0931	0049 0086 0539 0560 0591 0628 0659 0740 0745 0749 0753 0759
PRTBSY	A	004	1FAA	0894	0886
PTAREA	A	002	1FA3	0890	0885
RAY02	A	004	1475	0719	0111* 0272*
RAY05	A	003	1479	0720	0733
RAY10	A	003	1498	0729	0725 0727
RAY20	A	003	149E	0731	0721
RAY25	A	004	14A4	0733	0730
RAY30	A	004	14AB	0734	0723
RDCNTR	A	004	0A11	0027	0663 0761
RDFD	A	001	1F00	0870	0048* 0052 0053 0064 0066 0068 0070 0076 0078 0083 0084 0096 0100 0110 0113 0116 0119 0122 0124 0134 0136 0142 0145 0150 0157 0162* 0168 0169 0190 0192 0194* 0195* 0198* 0201* 0204* 0207* 0210* 0213* 0221 0222 0230 0231 0242 0243 0244 0245 0246 0247 0248 0249 0250 0251 0252 0256 0898 0920
RELOAD	A	004	0EC4	0329	0333
RT01	A	001	0A0D	0024	0018
SAMP	A	005	0EFB	0344	0318
SAMPLE	A	003	1606	0847	0221* 0530 0562
SAVEP	A	002	15DC	0831	0449* 0450 0463* 0467 0469* 0473* 0771* 0772 0774* 0779* 0780 0782*
SAVEIT	A	004	0FCB	0411	0414
SBYTE5	C	001	020D	0930	0058 0106 0293 0496 0506 0533
SCOPE	A	006	117D	0526	0665
SECD	A	006	123F	0578	0574 0603
SECD1	A	006	120D	0566	0585* 0568*
SECOND	A	006	0AF3	0110	0307
SENSE1	A	003	0F82	0389	0159* 0287 0394*
SENSE2	A	003	0F62	0379	0147* 0381
SENSE3	A	003	0F42	0369	0138* 0371
SETPRT	A	011	159D	0815	0306* 0421* 0424* 0427* 0439* 0479* 0484* 0693 0693* 0698* 0706* 0708* 0709
SETSEG	A	006	0BD6	0161	0163
SETUP	A	004	1388	0659	0655
SETUP1	A	004	14F6	0767	0811

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SETUP2	A	006	0B8D	0145	0140
SET1	A	004	0D98	0255	0253
SHIFT	A	006	0DF0	0273	0266
SNS	A	004	0A49	0041	0038
SNSW2A	C	001	0020	0939	0058 0106
SNSW2B	C	001	0010	0940	0293
SNSW28	C	001	0080	0937	0496 0506
SNSW29	C	001	0040	0938	0533
SNS1	A	003	1015	0435	0164* 0495
SNS2	A	003	1018	0436	0173*
SNS3	A	003	0FAA	0403	0165* 0407
SNS4	A	003	0FAD	0404	0174*
SNS5	A	003	0FE0	0419	0166* 0429
SNS6	A	003	0FE3	0420	0175*
SS	A	002	1CF4	0864	0116* 0500*
START	A	006	0F1D	0353	0349 0501
STOP	A	006	0A5C	0048	0045
SUB1	A	006	0F96	0394	0396
SUB2	A	006	0F72	0383	0385
SUB3	A	006	0F52	0373	0375
SYNC1	A	003	0F85	0390	0158*
SYNC2	A	003	0F65	0380	0146*
SYNC3	A	003	0F45	0370	0137*
TAB1	A	004	1103	0495	0189
TAB3	A	004	0FB9	0407	0220
TAB5	A	004	100D	0429	0217
TEN	A	002	15D6	0828	0187
THESE	A	004	0DC5	0265	0264* 0273 0273* 0274 0275* 0279* 0280
THIS1	A	004	13AD	0671	0670* 0673 0673* 0679 0680* 0689* 0692
TIME	A	007	15EA	0833	0338* 0345* 0521 0526* 0563* 0564 0578 0583 0590 0611 0615* 0708 0736*
TIMES	A	004	1F7D	0878	0168* 0286
TIMEUP	A	006	1443	0708	0697 0701 0703 0705
TIOCND	A	004	0F3B	0363	0152* 0904
TIOONE	A	004	0E94	0316	0121* 0129* 0167* 0314 0920*
TIOTWO	A	004	0E89	0313	0290* 0335 0886* 0894
TRYNXT	A	003	12C3	0613	0572 0588 0598 0602 0605 0607
TWO380	A	002	15FF	0841	0523
UNDER	A	006	0CD1	0215	0188
UNDER6	A	006	0C19	0173	0170
UNPACK	C	001	021E	0932	0322 0519
UP	A	009	15A7	0817	0582
UTAB	C	001	0232	0936	0037 0039
VARY	A	009	15C9	0821	0577
WAIT	A	006	1173	0524	0525
WAIT15	A	005	0FEF	0423	0425
WAIT50	A	006	0FF4	0424	0422
WASDN	A	008	15C0	0820	0627 0889
WASUP	A	008	15B8	0819	0625
WAY	A	004	0F37	0359	0139* 0144* 0153* 0156* 0254*
WHERE	A	004	0FA6	0397	0189* 0217* 0220* 0226 0364
WILL	A	006	12E7	0622	0619
WORK	A	012	1615	0849	0034* 0035 0321* 0324 0325 0327* 0372* 0373* 0374 0374* 0382* 0383* 0384 0384* 0393* 0394* 0395 0395* 0423* 0523* 0524* 0661* 0662 0716* 0717* 0734 0735
XCUTE	A	003	0EF1	0340	0337*
XCUTE2	A	003	0F0B	0347	0344*
XR1	C	001	0001	0927	0231* 0232 0233 0234 0235 0236 0237 0238 0239 0240 0241 0305* 0317 0319 0321 0334 0334* 0337 0338 0341 0341* 0344 0345 0354* 0356 0357 0369 0370 0379 0380 0389 0390 0403 0404 0405 0405* 0408* 0412 0412* 0419 0420 0423 0426 0426* 0435 0436 0437 0438 0440 0441 0442 0443 0446 0447 0448 0449 0452 0453 0454 0457 0458 0459 0460 0463 0464 0465 0466 0470 0471 0472 0476 0477 0478 0481 0482 0483 0486 0487 0488 0490 0491 0492 0493 0493* 0494 0528* 0553* 0556* 0569 0571 0580 0586 0613 0613* 0623 0690* 0694 0696 0700 0713 0713* 0716 0718* 0720 0722 0724 0726 0729

FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
XR2	C	001	0002	0928	0729* 0731 0731* 0734* 0768 0771 0776 0779 0329* 0330* 0355* 0409* 0444 0445* 0455 0456* 0461 0462* 0468 0474* 0529* 0554* 0557* 0584 0599 0601 0608 0614 0614* 0691* 0702 0708 0714 0714* 0717 0719* 0728 0732 0732* 0735* 0769 0770* 0773 0775* 0777 0778* 0781 0783*
ZERO	A	002	15F3	0836	0171 0317 0494

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

OBJECT CARD LISTING

THE CHARACTER ° INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
°GBK°GBD°°°PM°25	89722°EC°572266°	MASTER°TIMING°ANALYSIS°PROGRAM°°	84888488°°°°°°°°	°°°°°°°°	FF480000
T+-Y:"4-°°°°°B-4	°°|°&°°D°"°"°/0H	S""8#*1BCC°DO;JP	TC°DO4JPT|°°*8T3	"G>80°AQH|ĒYOE|H̄	A/T-°8A&FF480001
T+-Z5-°H38/°H|Ē°	B<%°ABV*0°°ZL0H*	BH̄S°°°|H̄GA*BG°SY	&CE8¬P0T¬0H*BF-E	-G58°8J88A8-D¬+B°	BC¬H°Q18FF480002
T+-D̄0U°$°/0HS""G	°/0HWHA8TG68<CJH	OG3G2/28°8/8A8YE	||¬<¬°¬HAB&1HEX*	¬H"H̄GCL74G0G2°&Q	<HJQ°72YFF480003
T+-,,31°P|*H¬°¬H	AE%BG°/YO+D°H&?H̄	&A%BG°S.0"%BGC/&	°°J8A0°DH̄N8BG°SR	HG5*0=8BGBV*8H°H	(8Z°°:2DFF480004
T+-%WA%BG°S."8-0	CG7H¬E00AEG-¬0L%	DEH<'&A'P8YDH̄+U°	H&00AG|&¬H8BG°SR	QG5*PI3%HCZH'1J8	DOHD°K.UFF480005
T+-_/G8°(A/81E;|	°°J"H̄+C-O"TX°E?8	20°Y:B°:HC°D+/A"	CC°°+*1*+C°°+-/*	|C°°+//*&C&D¬K1P	T8YD°8OUFF480006
T+->*F00CESD¬H&0	BC4*PI°0°C4<PH&0	AC3Y|K"H̄GC04AG38	H8"H̄AF00AC3Y|Ē00	CE/4¬K&0BC6*PG-0	°C6<°EA&FF480007
T+-?PE172/10'818	28-D|C°°||A*0C°D	|+/=89Y*QC°D|+-=	.C°<OFJ8'C°H|/1*	QC°°|-1*HC°&H$AP	TATD°"0QFF480008
T+-0KE00N20*BG1*	H4%°AB'Q<°A°0E?8	<°°=,E?8<°°"/E?8	H°°:HE?8<°1''G2°	(°J8(E;|2°&0<°J*	DE-< 83HFF480009
T+-3CE;|2°K-<°A8	CE?8828'$8Y)+C°°	¬°1$=|&DO""HAA33	HG5?2/3Y81A'$8Y*	3C°°¬°1*B|&<P°"H	AA30°L$IFF480012
T+-3=51'$8Y*¬|<Q	¬O"H̄GP°4AE0*H'|H̄	AB&0AC:U&D|H̄GA-0	AC:U|?°0BE-Q¬F0Q	BE-U¬FOQBE-UH"&4	CE/U°*CHFF480013
T+-49E)G2°&U<°-=	|C:X2/08&-°=(B°<	&H/'$0-D¬°10°DBY	°G°°&&&°*°AAĒ°A0	°DGD°G°°&S°°*°AB	-°A0°H3DFF480014
T+-54°AB7°A0°D<%	°G°°&8°°*°AC1°°-	BDC°¬00-BDD*¬00-	BDF°¬00-BDG*¬00-	BDH8¬00-BDH̄Q¬00-	BD.4°3ZQFF480015
T+-67G5%H°/CJG5%	H°/CWG5%H°/C7G5%	(°J83E;|2°&Q<°&8	:G88:&AHB|*-¬H?H̄	AAC_°EHH<°JLKG8D	<°J&°HD̄<FF480016
T+-7D̄6/=3|°°HHC0	°E(-8°AL-C°D(2A=	9+°D°°|H̄&I°8AE(H	H6°8AE(YH6°8°E(°	H6°8°E(-H6°8°E+°	H6°8°1°°FF480017
T+-8V°JJ8E)-+°°7	FC*$°°&7E|°D(1T-	DEH|°D°ZP+-&H&00	AC*-_8BGC*H8F1H	BC°<HJ1PTC°<¬;J'	°+|°°O-0FF480018
T+-9-C8|2D°488/08	LC°<+TAP88Y*Q+A°	BC¬H&A30&C1|2/06	8V08L8°°8"-°C|8	*8J32C|%$81?4C|8	;8/8°4CIFF480019
T+-:$80388G¬°)8*H	AG6°<°10)G7H1'A=	?|¬&+*"HAAC35CX<	1'J=?<¬Q¬,8G8DK4	98°:H8/°D0¬°J.H4	A°1H°1D̄-FF480020

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-#0∂"H̄AO7I0 ¦H̄	&+10AE/HA0H*BG-H	OEJQJC-HO /P4A2	ODJPK0 D+_CHBE)Y	6 /P10H&+2 ∂BE-H	H'< QTDFF480021
T+-∂J &#D4-DB0H*	+SJ0AC?<AG DH:-D	< A"FG∂X3 CK &.	/092G D¦C&D* JP	D̄ &0 G∂Q¬2¦< C-	&EHH 9BUFF480022
T+-'<∂/ H+/ H&%B	GCH-< /P?E-XB J$	∂0-HE=G0 BI0 C-Q	OEH*H4%BGC3?A ∂	#∂Y)U* A; OI	¦&-0 8C FF480023
T+-=G 1QMESDG<AQ	ME)H<AJQJE/G / '	K* A; OI ¦Q-0	CE/HOG&*0E/HH4-0	EE/D0D*BDC7I0 E	8 ∂Q FF480024
I+-"B0I ¦-%BGC9	< 1QME/UG<AQME)E	<∂JQJE/G / =00H*	¦DX AP A'HAA *	DE;∂H4% AC:,B J$	∂0-H JJ FF480025
T+-"'F?-< /P?E-X	/1L64-DDA2DH#1P	K0 D¦2∂BGD&)0 H	0 *G<AO)E).2/0H	*A/QH *-ER4H4%B	DC=∂ 53UFF480026
T+/ 84-DDC DHXJ'	5A3 H#1PK0 D¦8<B	GC#50 H0 ** A	/EXI OCER4¬)P	CJ0 DCH ;- +G	&+- QA-FF480027
T+/A3>- (-H-¬7	CJ0 DDD ;- +G0	N7 < AAVE)32/0A	0 4* AAS GY C,%	CQBE¬I* AA∂ G	CJ0 K/HFF480028
T+/B> AA9 GY C,Y	CQBG7∂¬ AP$ G	CJ0 DI ;- +C	&WJP$>0 ¦¦∂N7G	CJ0 DH̄- ;- +¦¦∂	N63Q QK-FF480029
T+/CZ /P:0H*&_X	CJ0 D.∂ ;- +A2D	NXJPH∂Y*J* (G	&40A: 8GD/O)E).	/ACH̄* (G &: A	: 8 LIHFF480030
T+/DUA0<H#1PK*	(G &=&A: #K &J	< &8N∂∂ ADAH8- H	(0A +EC/ EH¦2U Y	GDA34E). &∂)A3	¬;JH HK%FF480031
T+/E¬4?H̄AG<BGCW-	8- H(0I JJ&0AC'∂	¬_*BGC#4< &"¬G#4	< J,#P?4< J38G¦Y	(1NGE;¦2 &, /0H	S""U 8C8FF480032
T+/PĒ0H*H̄E∂BG /8	BE;YNU-0AE/HH"0∂	AE/HH'< ADP<<A/P	D̄E)D∂ A)OO-DĒ=%H	BG¦*< /P?E-Q8BAH	C0A ;1*FF480033
T+/GHD:D8& H(0I	LY60AD;%¬>*BG /Z	CL1OK""∂< JH<E(H	< JHKE(Y∂6A)LCEQ	PH/)LC *PH1H5¦F	P&∂H :I8FF480034
Y+/8& J,:0-H*'"H̄	GB<HAP?XB /36+ D	<B&DO, /OHĒD-0	BE;∂0A-0PE;YH460	PE4HH:-0HE2H 0	HE3 0CUFF480035
T+/I. ¦ JH<E)-	¦ JHKE)/8 &¦2DB(	6 &G2UI-8BANB∂/	(+ DH&?H̄&< 0HE3Y	H2&0PE4YH:?H̄G.P-	A ¬H :H̄4FF480036
Y+/H̄FDD <BA*:EĒ*	<A/)BE;D8 &¦2DAH	8 &P2U "2/5Y<BA*	:E$ <A/)BE:, /0H	Ē L*PH3YBEHH0BJH	BC Q H&4FF480037
T+/.AE4YH8"H̄G($-	A "H6P.-A ¬H6H̄*B	GDT∂8BANB∂/ ;+-D	H&?H̄GE0-A *B&DZ8	<BA*:E$ <A/)BE;Y	:BAH 08UFF480038
T+/.∂&_HA >HB -Q	UE;YH$ *0E;∂H4%	AD/∂8 /HB∂Z G+0H	H&?H̄GH00AD>∂KI7-	A ¦H̄&B&0GE3UH>¦H̄	GA-0 *THFF480039
T+/<7A1*9E*C /0H	Ē J4P+&8 D;0J:&8	DS KH 8 DI∂KT08	DV%KO08 DUUKK68	DSQKI-3 DZHKV&8	DD4 1BHFF480040
Y+/(2DD̄4+ AI/DNG	2-&08DAHC0A J8<B	GD)H∂ JGZ¦ DKHC0	ADI∂∂ JIS¦ DKKL0	ADSQ∂ JH̄H¦ DK,L0	ADWD 'T*FF480041
T+/+_+A H6"H6CTY	&EH<< JG,G&¬ /1G	-0H*BF/Q0 AQH¦¬∂	OE* AB/D:BANC0H*	J¬&0AED0H8-0AD#	¬>L- 5Q-FF480042

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/¦Y & ∂/A)C-	L,/+>C- HFA&QC-	HG/&;C- HH̄1&,C-	H<J&1C- H(1&70 D	L,LOAD:8∂ J&Q¦ D	HGT0 O8DFF480043
T+/&T J&1¦ DHH̄30	AEC*8-AHC∂/A;+Y	H&00AD# ¬_3QAE¬D	6 /P10H*L,&0H̄ER4	HXI-A "H&CP-A ¬H	&HC0 ĒY*FF480044
T+/J;∂JO$∂Y*¬; D	A∂Z L> DC∂Z (> D	A∂Z G¦¦DHY¬H̄GA-0	FER%H:-0H̄ HX&∂	AED0H6<BGD#&$-AH	C4-D 6THFF480045
T+/KR =HB 08 E5Q	H'C$AE/H4 /QLO-D	O4%HBE55'"0C2-J'	'"-C2-K((PH?H̄	DB44 J)O∂YHC7E0	4-D HIYFF480046
T+/LH ?H̄GA_HA ;H	BB∂BGEGU5 JQH(&H	ODOQUE;YH$C--EH¦	2DA8:HANC0H*BFU(	¦ER."'∂BG /YAOAR	70H* ∂D̄4FF480047
T+/H¦ /YBOA$¦0H*	BF-EQE5<GHJP?E).	J+/0H*BF/$ /0I	J(-H&J0 E& >-	(-H-¬-1∂ E)0 C	HD/H PH̄8FF480048
T+/HH̄7.% C3"E)0	6 /P:G HH-F:	6 /'"G0 H7 D< AH	4E)2∂ ∂"1P*(-H	H=%BG DA &DA	&D @1&FF480049
T+/OE&DA &LA &DA	&DA &<¦H5*LS&+.	A5(¬L1*J QDC0∂¦C	0∂DCH2*¦R5>.E04C	S0)LP4∂H 8∂XH1H_	&(< ¬@-FF480050
T+/P 0;.T&<¦H5*J	&DA &DA &DA &DA	&DA &+$E5; (1($	H5;$E5; (&+LP&+$	A8UCD5>$H9%GS&DC	U54 R.4FF480051
T+/P&&+PA6*ZA0_¦	E'¬C0∂¦C0∂¦C1∂¬	B- .P$¦""@A &DA	&DA &DA &DA &DA	&DC""0 *BGCY7	=A¦ ∂@DFF480052
TA1QC∂¦HT- C					2$ FF480053
T+/=8 ¬4< &95G:D	< &:DG:H< &:HG:<	< 0:<G:4∂C&8?0H*	.KAO'G:*-D&/∂B C	A9-:IG0 OHJH9DL∂	-*A∂ OĒ FF480054
TB/"C*&∂@D&*¦TA)	)E-<				"-UFF480055
TIJ"?C <¬11*HC D	+SA"_C ¬2J*HC	¬2A*LB <+VJ∂T0H*	.KA"?G∂&		=,*FF480056
* SSWS 28 - PRI	NT ONLY LAST SAM	PLE INFORMATION	ON STATUS ERROR	OR NOT READY.	FF480057
* SSWS 29 - PRI	NTOUT IN TABULAR	FORM.			FF480058
* SSWS 2B - BYP	ASS INITIAL NON-	SAMPLE EXECUTION	OF SAMPLE COMMA	ND -HFCU-	FF480059
* F9 HALT - SAM	PLING WAS NOT PE	RFORMED DUE TO AN	ERROR.		FF480060
* FE HALT - IF	SPECIFIED IN H2,	TO ALLOW CE INT	ERVENTION BEFORE	TEST I S PERFOR	MED. FF480061
* FF HALT - THE	PROGRAM IS NOW	READY TO HAVE A	-TAP- LOADED.		FF480062
* -FF- IN THE D	ATA SWITCHES PRI	OR TO THE COMPLE	TION OF THE TABU	LAR PRINTOUT.	FF480063
* WILL CAU	SE A SCOPE TYPE	PRINTOUT OF THE	SAME DATA.		FF480064

FF48 S/3 MASTER TIMING ANALYSIS PROGRAM (MTAP)

OBJECT CARD LISTING

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

*  -AA- IN THE L  EFT ADDRESS SWIT  CHES, WHEN THE -  FF- OR -F9- HALT  IS RESET, WILL  CAUSE   FF480065

*        A RE-EXE  CUTION OF THE PR  EVIOUSLY LOADED  TAP.                                      FF480066

*  THE INDICATED  UP OR DOWN COND  ITION REFERS TO  THE LOGIC LEVEL,  NOT THE BIT CON  DITIO   FF480067

*  -TAP- DECKS W  ILL BE LOADED FR  OM THE PRIMARY H  OPPER.                                    FF480068

E""'*E7*=-DC"PH$  ="7H6F|   ;   C    F%   ASC   R A  S0   Q              17300303750  50775@Q4FF480069
```

LAST PAGE

DATE	16MAR70	14APR70	29JUN70	01OCT70	30JUL73	15NOV74	02MAY75	PROG ID	FF4-8
EC NO.	816651	816678	816704	816760	577121	572239	572266	PAGE	14

8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           2          DECK  4
                           3          SEQ   0
0000                       4 E8910    START X'0000'
                           5          TREP
0A00                       6          ORG   X'A00'
                           7 ********************************************************************
                           8 *                        SECTION PREFACE                           *
                           9 ********************************************************************
0A00 8912          0A01   10          DC    XL2'8912'          EQUIPMENT AND SECTION NUMBER.
0A02 00            0A02   11          DC    XL1'00'            HAVE SECTION UDT ENTRIES
0A03 00            0A03   12 PRTN      DC    XL1'00'            CURRENT ROUTINE NUMBER
0A04 0000          0A05   13          DC    XL2'0'             RESERVED BYTES.
0A06 0A10          0A07   14          DC    AL2(RT01)          ADDRESS OF 1ST ROUTINE PREFACE.
0A08 6601          0A09   15          DC    AL2(ERRLOG)        ADDRESS OF ERROR LOGOUT
0A0A 890000        0A0C   16 UDT2    DC    XL3'890000'           INTEGR. DISP. ADAPTER
                          17 *                 OPTION   MEANING
                          18 *                   0      KATAKANA FEATURE INSTALLED
                          19 *                   1      3RD 2K FET STG CARD IS INSALLED.  (Z-W7T4)
                          20 *                   2      UNUSED
                          21 *                   3      PORTS 4,5,6     TERM. EXPANSION 1 (Z-W7R2)
                          22 *
                          23 *                   4      PORTS 7,8,9     TERM. EXPANSION 2 (Z-W7S2)
                          24 *                   5      PORTS 10,11,12  TERM. EXPANSION 3 (Z-W7T2)
                          25 *                   6      PORTS 13,14,15  TERM. EXPANSION 4 (Z-W7E2)
                          26 *                   7      PORTS 16,17,18  TERM. EXPANSION 5 (Z-W7F2)
                          27 *
                          28 *                   8      PORTS 19,20,21  TERM. EXPANSION 6 (Z-W7G2)
                          29 *                   9      PORTS 22,23,24  TERM. EXPANSION 7 (Z-W7E4)
                          30 *                   A      PORTS 25,26,27  TERM. EXPANSION 8 (Z-W7F4)
                          31 *                   B      PORTS 28,29,30  TERM. EXPANSION 9 (Z-W7G4)
0A0D 801000        0A0F   32 UDT3    DC    XL3'801000'           BSCA-1 (OPTIONAL)
                          33 *
                          34 ********************************************************************
                          35 *       ROUTINE 1 - TIO TEST                                       *
                          36 ********************************************************************
                          37 *                                                                  *
                          38 *            ALL ATTACHMENT  CONDITIONS ARE TESTED ON ENTRY        *
                          39 *            TO DETERMINE IF ANY CONDITION IS PENDING. AT THIS TIME.*
                          40 *            NO CONDITIONS SHOULD BE PENDING.                      *
                          41 *                                                                  *
                          42 ********************************************************************
                          43
0A10 01            0A10   44 RT01    DC    XL1'01'            ROUTINE NUMBER.
0A11 00            0A11   45          DC    XL1'00'            NO MANUAL INTERVENTION.
0A12 0A8D          0A13   46          DC    AL2(RT02)          NEXT ROUTINE.
                          47
0A14 39 01 4EF1           48          TBF   RENTRY,X'01'          TEST FOR RE-ENTRY VIA SYS
0A18 3B 01 4EF1           49          SBF   RENTRY,X'01'          RESET & RESET RE-ENTRY BIT.
0A1C C0 90 4885           50          BF    NTFRST                RESUME MANUAL INTERV. ROUTINE
0A20 C0 87 0A24           51 START   B     LABEL
0A24 38 01 020D           52 LABEL   TBN   SBYTE5,SSW2F
0A28 C0 87 0A2C           53          B     LABELR
0A2C C0 87 021A           54 LABELR  B     PRINT              PRINT ROUTINE HEADING
0A30 01            0A30   55          DC    XL1'01'
0A31 16            0A31   56          DC    IL1'22'
0A32 0A8C          0A33   57          DC    AL2(RT1ST)
                          58
0A34 F3 58 80             59          SIO   X'80',SIO1           .DISABLE (RESET ATTACHMENT)
0A37 3C 89 61AF           60          MVI   DEVID,X'89'          .RESTORE DEVICE ID
0A3B 3C F0 64D4           61          MVI   ELPFST,C'0'          .RESET ERROR LOG NO.
                   0A43   62          USING TIO1,XR1
                          63
0A3F C2 01 0A43           64          LA    TIO1,XR1
                          65
0A43 D1 58 08             66 TIO1    TIO   TIO3(,XR1),NOTRDY     ATTACHMENT NOT READY ?
                          67
0A46 C0 87 5B72           68          B     PRINTN               .ERROR HALT -01-.
0A4A 01            0A4A   69          DC    XL1'01'
```


8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

0A4B 1B                  0A4B   70          DC    IL1'27'
0A4C 69A2                0A4D   71          DC    AL2(SYNTM7)
                                72
0A4E D1 5D 12                   73 TIO3    TIO   TIO3ER(,XR1),ATTCHK       .ATTACHMENT CHECK
0A51 C0 87 0216                 74          B     LINK
                                75
                         0A55   76 TIO3ER  EQU   *                         .ERROR HALT -03-.
0A55 C1 9E 0A6B                 77          TIO   R01PRT,FETWRD             .BRANCH IF C.S. WRITE DATA CHK
0A59 C1 9A 0A64                 78          TIO   R01A8,NDBCHK              .BRANCH IF NDB CHK
0A5D C1 9B 0A6B                 79          TIO   R01PRT,CSCHK              .BRANCH IF C.S. DATA CHK
0A61 F2 87 07                   80          J     R01PRT
0A64 C1 9B 0A6B                 81 R01A8   TIO   R01PRT,CSCHK              .BRANCH IF C.S. DATA CHK TOO
0A68 F2 87 80                   82          J     R01PRT
0A6B C0 87 5B72                 83 R01PRT  B     PRINTN
0A6F 03                  0A6F   84          DC    XL1'03'
0A70 16                  0A70   85          DC    IL1'16'
0A71 6847                0A72   86          DC    AL2(STATN5)
                                87
0A73 C0 87 0216                 88          B     LINK                      EXIT ROUT.
                                89
0A77 D9D6E4E340F0F140 0A8C      90 RT1ST   DC    CL22'ROUT 01 ATTACHMENT TIO'
0A7F C1E3E3C1C3C8D4C5           90
0A87 D5E340E3C9D6               90
                                91 ********************************************************************
                                92 * ROUTINE 02 BSCA TIO COMMANDS                                    *
                                93 ********************************************************************
0A8D 02                  0A8D   94 RT02    DC    XL1'02'
0A8E 00                  0A8E   95          DC    XL1'00'
0A8F 0B05                0A90   96          DC    AL2(RT03)
0A91 C0 87 021A                 97          B     PRINT
0A95 01                  0A95   98          DC    XL1'01'
0A96 10                  0A96   99          DC    IL1'16'
0A97 0AAC                0A98  100          DC    AL2(R02MDR)
0A99 C0 87 0AAD                101          B     TIO17
0A9D D9D5E4E340F0F240 0AAC     102 R02MDR DC    CL16'ROUT 02 BSCA TIO'
0AA5 C2E2C3C140E3C6D6          102
0AAD C1 88 0AB5                103 TIO17  TIO   TIO18,X'88'                TIO BSCA NR/VC. SHOULD BR
0AB1 C0 87 0AC9                104          B     TIO17E
0AB5 C1 89 0AD5                105 TIO18  TIO   TIO18E,X'89'              TIO BSCA OP END INT. SHOULDN'T
0AB9 C1 8A 0AE1                106 TIO19  TIO   TIO19E,X'8A'              TIO BSCA BUSY. SHOUDN'T BRANCH
0ABD C1 8B 0AED                107 TIO20  TIO   TIO20E,X'8B'              TIO BSCA ITB INT. SHOULDN'T BR.
0AC1 C1 8C 0AF9                108 TIO21  TIO   TIO21E,X'8C'              TIO BSCA INT PEND. SHOULDN'T
0AC5 C0 87 0216                109          B     LINK
                               110
0AC9 C0 87 5B72                111 TIO17E B     PRINTN
0ACD 81                  0ACD  112          DC    XL1'81'                  ERROR -81-
0ACE 08                  0ACE  113          DC    IL1'08'
0ACF 617E                0AD0  114          DC    AL2(STAT84)
0AD1 C0 87 0216                115          B     LINK
                               116
0AD5 C0 87 5B72                117 TIO18E B     PRINTN
0AD9 82                  0AD9  118          DC    XL1'82'                  ERROR -82-
0ADA 11                  0ADA  119          DC    IL1'17'
0ADB 6087                0ADC  120          DC    AL2(STATN6)
0ADD C0 87 0216                121          B     LINK
                               122
0AE1 C0 87 5B72                123 TIO19E B     PRINTN
0AE5 83                  0AE5  124          DC    XL1'83'                  ERROR -83-
0AE6 0A                  0AE6  125          DC    IL1'10'
0AE7 619A                0AE8  126          DC    AL2(STAT86)
0AE9 C0 87 0216                127          B     LINK
                               128
0AED C0 87 021A                129 TIO20E B     PRINT
0AF1 84                  0AF1  130          DC    XL1'84'                  ERROR -84-
0AF2 11                  0AF2  131          DC    IL1'17'
0AF3 6087                0AF4  132          DC    AL2(STATN6)
0AF5 C0 87 0216                133          B     LINK
                               134
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ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

    0AF9 C0 87 5B72              135 TIO21E B     PRINTH
    0AFD 85                 0AFD 136        DC    XL1'85'                       ERROR -85-
    0AFE 11                 0AFE 137        DC    IL1'17'
    0AFF 6087               0B00 138        DC    AL2(STATM6)
    0B01 C0 87 0216              139        B     LINK
                                 140
                                 141 ****************************************************
                                 142 *      ROUTINE 3 - STORAGE ADDRESS LSR TEST       *
                                 143 ****************************************************
                                 144 *                                                 *
                                 145 *      THE CRT DATA ADDRESS REGISTER IS TESTED FOR CORRECT *
                                 146 *      LOADING, CORRECT PARITY, BITS STUCK ON OR OFF.      *
                                 147 *                                                 *
                                 148 ****************************************************
                                 149
    0B05 03                 0B05 150 RT03   DC    XL1'03'               .ROUTINE 3
    0B06 00                 0B06 151        DC    XL1'0'
    0B07 0B6C               0B08 152        DC    AL2(RT04)             .NEXT ROUTINE
                                 153
    0B09 C0 87 021A              154        B     PRINT                 .PRINT ROUTINE HEADING
    0B0D 01                 0B0D 155        DC    XL1'01'
    0B0E 10                 0B0E 156        DC    IL1'16'
    0B0F 0B6B               0B10 157        DC    AL2(RT2ST)
    0B11 3C FF 0B58              158 SAB6   MVI   RT2FLG,X'FF'          .INITIALIZE FLAG
    0B15 F3 58 80                159        SIO   X'80',SIOI            .DISABLE
    0B18 F3 58 C0                160        SIO   X'C0',SICI            .ENABLE
    0B1B 3C 48 0B20              161 RT2END MVI   RT2LIO+1,HDB0         .INITIALIZE THE LIO OP
    0B1F 31 00 0D62              162 RT2LIO LIO   ZERO,*-*              .TRY TO PUT ZERO IN HDB'S
    0B23 3D 4F 0B20              163        CLI   RT2LIO+1,HDB7         .TEST FOR LAST HDB'S
    0B27 F2 81 0A                164        JE    RT2LCS                .IF SO, JUMP OUT
    0B2A 0E 00 0B20 5ACB         165        ALC   RT2LIO+1(1),WUN       .ADD 1 TO LIO TO DO NEXT HDB'S
    0B30 C0 87 0B1F              166        B     RT2LIO                .GO LOAD NEXT HDB
    0B34 F3 58 80                167 RT2LCS SIO   X'80',SIOI            .DISABLE
    0B37 3D FF 0B58              168        CLI   RT2FLG,X'FF'          .TEST FOR 1ST TIME THRU
    0B3B 3C 00 0B58              169        MVI   RT2FLG,0              .SET FLAG TO ZERO
    0B3F C0 81 0B1B              170        BE    RT2END                .DO LOW HDB'S IF NOT DONE
    0B43 F3 58 C0                171        SIO   X'C0',SIOI            .ENABLE, HDB'S ALL LOADED
    0B46 31 58 0D62              172 RT2LD  LIO   ZERO,CTSTOR           .PUT ZEROES IN CONTROL STORE
    0B4A 0E 00 0B58 5ACB         173        ALC   RT2FLG(1),WUN         .INCREMENT COUNTER
    0B50 C0 01 0B46              174        BNZ   RT2LD                 .LOAD TIL 1ST 256 WORDS DONE
    0B54 F3 58 80                175        SIO   X'80',SIOI            .RESET ATTACHMENT
    0B57 C0 87 0216              176        B     LINK                  .GO TO NEXT ROUTINE
    0B5B 00                 0B5B 177 RT2FLG DC    XL1'00'               .FLAG AND COUNTER
                                 178
    0B5C D9D6E4E340F0F340   0B6B 179 RT2ST  DC    CL16'ROUT 03 HDB INIT'
    0B64 C8C4C240C9D5C9E3        179
                                 180 ****************************************************
                                 181 *      ROUTINE 4 -  HDB TEST                      *
                                 182 ****************************************************
                                 183 *                                                 *
                                 184 *             OP-DECODE REGISTER IS LOADED AND CHECKED FOR NORMAL  *
                                 185 *             INDICATIONS. THE HIGH DENSITY BUFFERS 00-1F          *
                                 186 *             (HDB'S) WILL BE LOADED, SENSED, AND THE CONDITIONS   *
                                 187 *             CHECKED.  THE DATA USED IS 0000, FFFF, AA55, 55AA, 0202 &*
                                 188 *             THE ACTUAL HDB ADDRESS (00,01,02,-----1D,1E,1F).     *
                                 189 *                                                 *
                                 190 *      SETTING SENSE SWITCH 10 ON CAUSES THE CONTENTS OF THE HDB'S *
                                 191 *      TO BE PRINTED OUT AS THEY ARE SENSED.      *
                                 192 *                                                 *
                                 193 ****************************************************
                                 194
    0B6C 04                 0B6C 195 RT04   DC    XL1'04'                 ROUTINE 4.
    0B6D 00                 0B6D 196        DC    XL1'00'                 NO MANUAL INTERVENTION REQUIRED.
    0B6E 0E02               0B6F 197        DC    AL2(RT05)               NEXT ROUTINE.
                                 198
    0B70 C0 87 021A              199        B     PRINT
    0B74 01                 0B74 200        DC    XL1'01'
    0B75 25                 0B75 201        DC    IL1'37'
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ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

    0B76 0D87               0B77 202        DC    AL2(RT3ST)
                                 203
    0B78 C0 87 5038              204 R03ST  B     LDOP                  .LOAD OP-DEC REGS WITH CORR DATA
    0B7C 0C 01 0D8F 0D5D         205        MVC   HDBST(2),X1021        .INITIALIZE ADDRESS
    0B82 3C 00 0D60              206        MVI   INCFLG,X'00'          .RESET INCREMENT FLAG
    0B86 3C 00 6187              207        MVI   XFLAG,X'00'
    0B8A 3C 00 6188              208        MVI   YFLAG,X'00'
    0B8E 3C 00 6189              209        MVI   ZFLAG,X'00'
    0B92 F3 58 C0                210        SIO   X'C0',SIOI            .ENABLE ATTACHMENT
                                 211
                            0C6D 212        USING R30000,XR1
    0B95 C2 01 0C6D              213        LA    R30000,XR1
                                 214
    0B99 0D FF 5512 5512         215        CLC   REPEAT(256),REPEAT    .DELAY
    0B9F C1 58 0BAB              216        TIO   R03K03,NOTRDY         ATTACHMENT NOT RDY? IF READY
    0BA3 C0 87 5B72              217        B     PRINTH                .ERROR HALT -09-
    0BA7 09                 0BA7 218        DC    XL1'09'
    0BA8 1B                 0BA8 219        DC    IL1'27'
    0BA9 60A2               0BAA 220        DC    AL2(STATM7)
                                 221
    0BAB C1 5E 0BF5              222 R03K03 TIO   R03K05,FETWRD         .BRANCH IF C.S. ERROR
    0BAF C1 5C 0BF5              223        TIO   R03K05,FETADR         .BRANCH IF C.S. ERROR
    0BB3 3C FF 6180              224        MVI   ATTFLG,X'FF'          .SET ATTACHMENT CHK. FLG.
    0BB7 C1 5D 0BBF              225        TIO   R03NOE,ATTCHK         .BRANCH IF ATT. CHK.
    0BBB 3C 00 6180              226        MVI   ATTFLG,0              .RESET ATT. CHK. FLAG
                                 227
    0BBF F3 58 84                228 R03NOE SIO   X'84',SIOI            .RESET ATT. AND SET DIAG. 2
    0BC2 3C 00 0DF0              229        MVI   OPDECD,0              .INITIALIZE DATA
    0BC6 31 59 0DF0              230 R03K04 LIO   OPDECD,OPDEC          .LOAD OP DEC WITH BAD PARITY
    0BCA 0E 00 0DF0 5ACB         231        ALC   OPDECD(1),WUN         .INCREMENT TO NEXT REG
    0BD0 3D 20 0DF0              232        CLI   OPDECD,X'20'          .TEST FOR END
    0BD4 C0 01 0BC6              233        BNE   R03K04                .LOOP IF NOT END
    0BD8 F3 58 C0                234        SIO   X'C0',SIOI            .ENABLE & RESET DIAG. 2
    0BDB 0D FF 5512 5512         235        CLC   REPEAT(256),REPEAT    .DELAY
    0BE1 C1 5D 0BE9              236        TIO   R03K06,ATTCHK         .ATTACHMENT CHECK MUST BE ON
    0BE5 C0 87 0DA7              237        B     R03EPA                .ERROR IF NO ATT. CHK.
    0BE9 3D FF 6180              238 R03K06 CLI   ATTFLG,X'FF'          .WAS THERE AN ATTACHMENT CHECK?
    0BED C0 81 0DA7              239        BE    R03EPA                .GO TO ERROR IF SO
    0BF1 C0 87 5038              240        B     LDOP                  .GO RELOAD OP DECODE REGS
                                 241
    0BF5 F3 58 80                242 R03K05 SIO   X'80',SIOI            .RESET ATTACHMENT
    0BF8 31 48 0D62              243        LIO   ZERO,HDB0             .TRY TO LOAD ZERO IN HDB 00-01
    0BFC 30 48 0DEC              244        SNS   HOLD1,HDB0            .SENSE CONTENTS OF HDB 00-01
    0C00 31 48 0D59              245        LIO   XFFFF,HDB0            .TRY TO LOAD FFFF IN HDB 00-01
    0C04 30 48 0DEE              246        SNS   HOLD2,HDB0            .SENSE CONTENTS OF HDB 00-01
    0C08 3C 0B 0C60              247        MVI   R3HLT,X'0B'           .SET UP FOR HALT 0B
    0C0C 3C FF 6187              248        MVI   XFLAG,X'FF'           .SET FLAGS              *
    0C10 0D 01 0DEC 0DEE         249        CLC   HOLD1(2),HOLD2        .SEE IF HDB CONTENTS CHANGED
    0C16 F2 81 22                250        JE    R3E                   .ERROR IF EQUAL
    0C19 3C 0C 0C60              251        MVI   R3HLT,X'0C'           .SET UP FOR HALT 0C
    0C1D 3C F0 6187              252        MVI   XFLAG,X'F0'           .SET FLAGS              *
    0C21 0D 00 0DEB 0DED         253        CLC   HOLD1-1(1),HOLD2-1    .SEE IF HI BYTE CHANGED
    0C27 F2 81 11                254        JE    R3E                   .ERROR IF NOT
    0C2A 0D 00 0DEC 0DEE         255        CLC   HOLD1(1),HOLD2        .SEE IF LO BYTE CHANGED
    0C30 F2 01 30                256        JNE   R3RST                 .CONTINUE IF IT CHANGED
    0C33 3C 0D 0C60              257        MVI   R3HLT,X'0D'           .SET FOR HALT 0D
    0C37 3C 0F 6187              258        MVI   XFLAG,X'0F'           .SET FLAGS              *
    0C3B 0C 00 0C52 0C60         259 R3E    MVC   R3HLT1(1),R3HLT       .SET HALT CODE
    0C41 0C 01 0D53 5ACB         260        MVC   HDBA(2),WUN           .SET UP ADDR FOR PRINT
    0C47 0C 01 5FE6 0DEC         261        MVC   STATAC(2),HOLD1       .MOVE 1ST RESULTS TO STATAC
    0C4D C0 87 50A5              262 R3EPO  B     STATUS                .GO PRINT ERROR
    0C51 81                 0C51 263        DC    XL1'81'               .PRINT HDB ADDR, EXP, ACT NO HLT
    0C52 00                 0C52 264 R3HLT1 DC    XL1'00'               .ERROR HALT -0B-  -0C-  OR -0D-
    0C53 0000               0C54 265        DC    XL2'0000'             .1ST EXP. RESULT
    0C55 0C 01 5FE6 0DEE         266        MVC   STATAC(2),HOLD2       .MOVE 2ND RESULT TO STATAC
    0C5B C0 87 50A5              267        B     STATUS                .GO PRINT 2ND ERROR
    0C5F 80                 0C5F 268        DC    XL1'80'               .PRINT HDB ADDR, EXP, ACT
    0C60 00                 0C60 269 R3HLT  DC    XL1'00'               .ERROR HALT -0B-  -0C-  OR  -0D-
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ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT		
0C61	FFFF	0C62	270	DC	XL2'FFFF'	.EXPECTED 2ND RESULT
0C63	3C 00 6187		271	R0BST	MVI	MFLAG,0	.RESET FLAGS
			272				
0C67	F3 58 80		273	R3DISA	SIO	X'80'+BIOI	.DISABLE TO RESET
0C6A	F3 58 C0		274		SIO	X'C0'+BIOI	.ENABLE ATTACHMENT
0C6D	5C 01 71 F5		275	R38000	MVC	R03DT1(2,XR1),ZERO(,XR1)	.USE ZERO FOR DATA
0C71	F2 87 84		276		J	R03K18	.GO LOAD MDB'S
0C74	5C 01 71 EC		277	R3FFFF	MVC	R03DT1(2,XR1),XFFFF(,XR1)	.USE FFFF AS DATA
0C78	F2 87 1D		278		J	R03K15	
0C7B	5C 01 71 E9		279	R3AA55	MVC	R03DT1(2,XR1),XAA55(,XR1)	.USE AA55 AS DATA
0C7F	F2 87 16		280		J	R03K18	
0C82	5C 01 71 EA		281	R355AA	MVC	R03DT1(2,XR1),X55AA(,XR1)	.USE 55AA AS DATA
0C86	F2 87 0F		282		J	R03K15	
0C89	5C 01 71 EE		283	R30202	MVC	R03DT1(2,XR1),X0202(,XR1)	.USE 0202 AS DATA
0C8D	F2 87 08		284		J	R03K15	
0C90	3C FF 0D60		285	R3INC	MVI	INCFLG,X'FF'	.SET INCREMENT DATA FLAG
0C94	5C 01 71 F2		286		MVC	R03DT1(2,XR1),MDBST(,XR1)	.INITIALIZE DATA
			287				
0C98	7C 48 2F		288	R03K15	MVI	R03K16+1(,XR1),MDB0	.SET UP TO LOAD MDB'S
0C9B	71 00 71		289	R03K16	LID	R03DT1(,XR1),0	.LOAD ALL MDB'S WITH DATA
0C9E	79 FF F3		290		TBF	INCFLG(,XR1),X'FF'	.TEST FOR INCREMENTING DATA
0CA1	F2 10 04		291		JT	R03K21	.JUMP IF NOT
0CA4	5E 01 71 EE		292		ALC	R03DT1(2,XR1),X0202(,XR1)	.IF SO INCREMENT DATA
0CA8	5E 00 2F E7		293	R03K21	ALC	R03K16+1(,XR1),R03ONE(1,XR1)	
0CAC	7D 4F 2F		294		CLI	R03K16+1(,XR1),MDB7	EXIT WHEN ALL MDB'S LOADED
0CAF	D0 04 2E		295		BNH	R03K16(,XR1)	IF NOT, GO LOAD NEXT MDB'S.
			296				
0CB2	5C 01 E6 F2		297		MVC	MDBA(2,XR1),MDBST(,XR1)	.INITIALIZE MDB ADDRESSES
0CB6	7C 48 57		298		MVI	R03K17+1(,XR1),MDB0	.SET UP TO SENSE MDB'S
0CB9	79 FF F3		299		TBN	INCFLG(,XR1),X'FF'	.TEST FOR INCREMENTING DATA
0CBC	F2 90 04		300		JF	R03K17	.JUMP IF NOT
0CBF	5C 01 71 F2		301		MVC	R03DT1(2,XR1),MDBST(,XR1)	.INITIALIZE EXP. DATA IF INCR.
0CC3	30 00 5FE6		302	R03K17	SNS	STATAC,*-*	.SENSE MDB'S
0CC7	C1 5A 0D8F		303		TID	R03ERR,MDBCHK	.ERROR IF MDB CHK
0CCB	1D D1 5FE6 71		304		CLC	STATAC,R03DT1(2,XR1)	.COMPARE FOR EXPECTED DATA
0CD0	F2 81 0C		305		JE	R03K18	IF YES, CONTINUE. IF NOT, ERROR.
0CD3	C0 87 0D3F		306		B	R03ERR	
			307				
0CD7	C0 87 5DA5		308	R03PRT	B	STATUS	
0CD8	80	0CD8	309		DC	XL1'80'	.PRINT MDB ADDR, EXP & ACT DATA
0CDC	11	0CDC	310		DC	XL1'11'	.ERROR HALT -11-
0CDD	0000	0CDE	311	R03DT1	DC	XL2'0000'	.EXPECTED DATA
			312				
0CDF	5E 00 57 E7		313	R03K18	ALC	R03K17+1(,XR1),R03ONE(1,XR1)	
0CE3	5E 01 E6 EE		314		ALC	MDBA(,XR1),X0202(2,XR1)	.ADD ONE TO MDB ADDRESS
0CE7	79 FF F3		315		TBF	INCFLG(,XR1),X'FF'	.TEST FOR NOT INCREMENTING DATA
0CEA	F2 10 04		316		JT	R03K22	.IF NOT CONTINUE
0CED	5C 01 71 E6		317		MVC	R03DT1(2,XR1),MDBA(,XR1)	.IF SO MOVE IN NEXT DATA
0CF1	7D 4F 57		318	R03K22	CLI	R03K17+1(,XR1),MDB7	.EXIT WHEN ALL MDB'S SENSED
0CF4	D0 04 56		319		BNH	R03K17(,XR1)	.IF NOT GO SENSE NEXT MDB'S
			320				
0CF7	C1 5A 0DB3		321		TID	R03E09,MDBCHK	.ERROR IF MDB CHECK
0CFB	38 80 020A		322		TBN	SBYTE2,SSW10	.PRINT IF SSW 10 IS ON
0CFF	F2 90 0E		323		JF	R03K19	.CONTINUE IF NOT
0D02	78 10 F2		324		TBN	MDBST(,XR1),X'10'	.TEST FOR DOING HI MDB'S
0D05	C0 10 5BE7		325		BT	MDBH	.PRINT HI MDB'S
0D09	79 10 F2		326		TBF	MDBST(,XR1),X'10'	.TEST FOR DOING LO MDB'S
0D0C	C0 10 5BF9		327		BT	MDBL	.GO PRINT LO MDB'S
			328				
0D10	5D 01 71 F5		329	R03K19	CLC	R03DT1(2,XR1),ZERO(,XR1)	.CHECK FOR DATA = 0000
0D14	D0 81 07		330		BE	R3FFFF(,XR1)	.IF SO USE DATA = FFFF
0D17	5D 00 70 EC		331		CLC	R03DT1-1(1,XR1),XFFFF(,XR1)	.CHECK FOR DATA = FFFF
0D1B	D0 81 0E		332		BE	R3AA55(,XR1)	.IF SO USE DATA = AA55
0D1E	5D 00 70 E8		333		CLC	R03DT1-1(1,XR1),XAA55-1(,XR1)	.CHECK FOR DATA = AA55
0D22	D0 81 15		334		BE	R355AA(,XR1)	.IF SO USE DATA = 55AA
0D25	5D 00 70 E9		335		CLC	R03DT1-1(1,XR1),X55AA-1(,XR1)	.CHECK FOR DATA = 55AA
0D29	D0 81 1C		336		BE	R30202(,XR1)	.IF SO USE DATA = 0202
0D2C	5D 00 70 EE		337		CLC	R03DT1-1(1,XR1),X0202(,XR1)	.CHECK FOR DATA = 0202

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ERR LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT		
0D30	90 81 23		338		BE	R3INC1(,XR1)	.IF SO USE INCR. DATA
			339				
			340				
0D33	79 10 F2		340		TBF	MDBST(,XR1),X'10'	.TEST FOR DOING LO MDB'S
0D36	F2 10 0E		341		JT	R03K20	.IF SO, EXIT
0D39	4C 81 F2 5ADB		342		MVC	MDBST(2,XR1),MAN	.SET UP FOR LO MDB'S
0D3E	7C 00 F3		343		MVI	INCFLG(,XR1),X'00'	.RESET THE INCREMENT FLAG
0D41	F3 58 80		344		SIO	X'80'+BIOI	.DISABLE ATTACHMENT AND GO
0D44	90 87 00		345		B	R30000(,XR1)	TEST THE LO MDB'S
			346				
			347				
0D47	3D 42 2A88		348	R03K20	CLI	PRTN,X'42'	.TEST FOR ROUTINE 42
0D48	C0 81 0E3E		349		BE	R3CST	.IF SO, SET MDB'S 20-3F
0D4F	F2 87 36		350		J	R03END	.GO CHECK MDB 10-11 NOT CHANGED
			351				
			351				
			351				
			352	**********			
			353	* CONSTANTS			**********
			354	**********			
			355				
0D52	8000	0D53	356	MDBA	DC	XL2'0'	.MDB ADDRESSES
0D54	01	0D54	357	R03ONE	DC	XL1'01'	
0D55	AA55	0D56	358	XAA55	DC	XL2'AA55'	.-AA55-
0D57	AA	0D57	359	X55AA	DC	XL1'AA'	.-55AA-
0D58	FFFF	0D59	360	XFFFF	DC	XL2'FFFF'	
0D5A	0202	0D5B	361	X0202	DC	XL2'0202'	.WORK CONSTANT
0D5C	1011	0D5D	362	X1011	DC	XL2'1011'	.WORK CONSTANT
0D5E	0000	0D5F	363	MDBST	DC	XL2'0'	.WORK SPACE
0D60	00	0D60	364	INCFLG	DC	XL1'0'	.INCREMENTING FLAG
0D61	0000	0D62	365	ZERO	DC	XL2'0000'	
			366				
			366				
0D63	D9D6E4E340F44 0D6	0D87	367	RT3ST	DC	CL37'ROUT 4 OP-DEC LOAD & MDB TEST (00-1F)'	
0D6B	D760C4C5C3400 3D6		367				
0D73	C1C4405040C8C4C2		367				
0D7B	40E3C5E2E3404 0F0		367				
0D83	F060F1C05D		367				
0D88	F3 58 C0		368	R03END	SIO	X'C0'+SIOI	.ENABLE ATTACHMENT
0D8B	30 48 5FE6		369		SNS	STATAC+MDB0	.SENSE MDB 10-11
0D8F	0D 01 5FE6 0D5D		370		CLC	STATAC(2),X1011	.CHECK THAT IT DID NOT CHANGE
0D95	C0 81 0216		371		BE	LINK	.TERMINATE ROUTINE IF OKAY
0D99	0C 01 0D53 0D5D		372		MVC	MDBA(2),X1011	.SET UP MDB ADDRESS FOR PRINT
0D9F	C0 87 5DA5		373		B	STATUS	.GO PRINT ERROR
0DA3	80	0DA3	374		DC	XL1'80'	.PRINT MDB ADDR, EXP, ACT
0DA4	12	0DA4	375		DC	XL1'12'	.ERROR HALT -12-
0DA5	1011	0DA6	376		DC	XL2'1011'	.EXPECTED RESULT
			377				
			377				
			377				
			378	**********			
			379	* ERRORS			**********
			380	**********			
			381				
0DA7	C0 87 5B72		382	R03EPA	B	PRINTN	
0DAB	0E	0DAB	383		DC	XL1'0E'	.ERROR HALT -0E-
0DAC	11	0DAC	384		DC	IL1'17'	
0DAD	0E01	0DAE	385		DC	AL2(OPDECF)	
0DAF	C0 87 0BAF		386		B	R03K03+4	
			387				
0DB3	C0 87 5B72		388	R03E09	B	PRINTN	ATTACHMENT CHECK
0DB7	10	0DB7	389		DC	XL1'10'	.ERROR HALT -10-
0DB8	10	0DB9	390		DC	IL1'16'	
0DB9	6047	0DBA	391		DC	AL2(STATN5)	
0DBB	C0 87 0D18		392		B	R03K19	
			393				
			393				
			393				

0912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0DBF 3C 00 6188           394 R03ERR MVI   YFLAG,X'00'
   0DC3 0D 00 5FE5 5F85      395        CLC   STATAC-1(1),STATAC      HI=LO OF ACTUAL?
   0DC9 C8 81 0CD7           396        BE    R03PRT                 BR IF SO
   0DCD 0E 00 5FE5 5689      397        ALC   STATAC-1(1),X0001      INC ACTUAL HI
   0DD3 0D 30 5FE5 5F86      398        CLC   STATAC-1(1),STATAC     TRY AGAIN
   0DD9 C0 81 0DE1           399        BE    R3ACPT
   0DDD 3C FF 6188           400        MVI   YFLAG,X'FF'
   0DE1 0F 00 5FE5 5689      401 R3ACPT SLC   STATAC-1(1),X0001      RESTORE ACTUAL
   0DE7 C0 87 0CD7           402        B     R03PRT
                             403
   0DEB 0000          0DEC   404 HOLD1  DC    XL2'0000'              .TEMPORARY HOLD
   0DED 0000          0DEE   405 HOLD2  DC    XL2'0000'              .TEMPORARY HOLD
   0DEF 2200          0DF0   406 OPDECD DC    XL2'2200'              .DUMMY OP DEC DATA
   0DF1 D6D740C4C5C3D6C4 0E01 407 OPDECF DC    CL17'OP DECODE FAILURE'
   0DF9 C540C6C1C9D3E4D9
   0E01 C5                   407
                             408
                             408
                             409 ********************************************************************
                             410 *      ROUTINE 05   HDB TEST (HDB'S 20-3F)                         *
                             411 ********************************************************************
                             412 *                                                                  *
                             413 *           CP-DECODE REGISTER IS LOADED AND CHECKED FOR NORMAL     *
                             414 *           INDICATIONS. THE HIGH DENSITY BUFFERS 20-3F            *
                             415 *           (HDB'S) WILL BE LOADED, SENSED, AND THE CONDITIONS     *
                             416 *           CHECKED.  THE DATA USED IS 0000, FFFF, AA55, 55AA, 0202 &*
                             417 *           THE ACTUAL HDB ADDRESS (20,21,22,-----3D,3E,3F).       *
                             418 *                                                                  *
                             419 *      SETTING SENSE SWITCH 10 ON CAUSES THE CONTENTS OF THE HDB'S *
                             420 *      TO BE PRINTED OUT AS THEY ARE SENSED.                       *
                             421 *                                                                  *
                             422 ********************************************************************
                             423
   0E02 05            0E02   424 RT05   DC    XL1'05'                ROUTINE 05.
   0E03 00            0E03   425        DC    XL1'00'                NO MANUAL INTERVENTION REQUIRED.
   0E04 11D7          0E05   426        DC    AL2(RT06)              NEXT ROUTINE.
                             427
   0E06 C0 87 021A           428        B     PRINT
   0E0A 01            0E0A   429        DC    XL1'01'
   0E0B 25            0E0B   430        DC    XL1'37'
   0E0C 1020          0E0D   431        DC    AL2(RT3CST)
                             432
   0E0E C0 87 5D38           433 R3CST  B     LOOP                   .LOAD OP-DEC REGS WITH CORR DATA
   0E12 0C 01 0FF6 0FFB      434        MVC   HDBSTC(2),=X3031       .INITIALIZE ADDRESS
   0E18 3C 00 0FF7           435        MVI   INCFLC,X'00'           .RESET INCREMENT FLAG
   0E1C 3C 00 6187           436        MVI   XFLAG,X'00'
   0E20 3C 00 6188           437        MVI   YFLAG,X'00'
   0E24 3C 00 6189           438        MVI   ZFLAG,X'00'
   0E28 F3 58 C0             439        SIO   X'C0',SIO1             .ENABLE ATTACHMENT
                             440
                      0F03   441        USING R3C000,XR1
   0E2B C2 01 0F03           442        LA    R3C000,XR1
                             443
   0E2F 0D FF 5512 5512      444        CLC   REPEAT(256),REPEAT     .DELAY
   0E35 C1 58 0E41           445        TIO   R3CK03,NOTRDY          ATTACHMENT NOT RDY? IF READY
   0E39 C0 87 5B72           446        B     PRINTH                 .ERROR HALT -09-
   0E3D 09            0E3D   447        DC    XL1'09'
   0E3E 1B            0E3E   448        DC    XL1'27'
   0E3F 60A2          0E40   449        DC    AL2(STATM7)
                             450
   0E41 C1 5E 0E88           451 R3CK03 TIO   R3CK05,FETWRD         .BRANCH IF C.S. ERROR
   0E45 C1 5C 0E88           452        TIO   R3CK05,FETADR         .BRANCH IF C.S. ERROR
   0E49 3C FF 6180           453        MVI   ATTFLG,X'FF'           .SET ATTACHMENT CHK. FLG.
   0E4D C1 5D 0E55           454        TIO   R3CNOE,ATTCHK          .BRANCH IF ATT. CHK.
   0E51 3C 00 6180           455        MVI   ATTFLG,0               .RESET ATT. CHK. FLAG
                             456
   0E55 F3 58 84             457 R3CNOE SIO   X'84',SIO1             .RESET ATT. AND SET DIAG. 2
   0E58 3C 00 0DF0           458        MVI   OPDECD,0               .INITIALIZE DATA
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E5C 31 80 0DF8           459 R3CK04 LIO   OPDECD,OPDEC           .LOAD OP DEC WITH BAD PARITY
   0E60 0E 00 0DF8 5ACB      460        ALC   OPDECD(1),=X'00'       .INCREMENT TO NEXT REG
   0E66 3D 20 0DF8           461        CLI   OPDECD,X'20'           .TEST FOR END
   0E6A C8 01 0E5C           462        BNE   R3CK04                 .LOOP IF NOT END
   0E6E F3 58 C0             463        SIO   X'C0',SIO1             .ENABLE & RESET DIAG. 2
   0E71 0D FF 5512 5512      464        CLC   REPEAT(256),REPEAT     .DELAY
   0E77 C1 5D 0E7F           465        TIO   R3CK06,ATTCHK          .ATTACHMENT CHECK MUST BE ON
   0E7B C0 87 1040           466        B     R3CERA                 .ERROR IF NO ATT. CHK.
   0E7F 3D FF 6180           467 R3CK06 CLI   ATTFLG,X'FF'           .WAS THERE AN ATTACHMENT CHECK?
   0E83 C0 81 1040           468        BE    R3CERA                 .GO TO ERROR IF SO
   0E87 C0 87 5D38           469        B     LOOP                   .GO RELOAD OP DECODE REGS
                             470
   0E8B F3 58 80             471 R3CK05 SIO   X'80',SIO1             .RESET ATTACHMENT
   0E8E 31 88 0D62           472        LIO   ZERO,X'88'             .TRY TO LOAD ZERO IN HDB 20-21
   0E92 30 88 0DEC           473        SNS   HOLD1,X'88'            .SENSE CONTENTS OF HDB 20-21
   0E96 31 88 0D59           474        LIO   XFFFF,X'88'            .TRY TO LOAD FFFF IN HDB 20-21
   0E9A 30 88 0DEE           475        SNS   HOLD2,X'88'            .SENSE CONTENTS OF HDB 20-21
   0E9E 3C 0B 0EF6           476        MVI   R3CHL,X'0B'            .SET UP FOR HALT 0B
   0EA2 3C FF 6187           477        MVI   XFLAG,X'FF'            .SET FLAGS                    *
   0EA6 0D 01 0DEC 0D8E      478        CLC   HOLD1(2),HOLD2         .SEE IF HDB CONTENTS CHANGED
   0EAC F2 81 22             479        JE    R3CE                   .ERROR IF EQUAL
   0EAF 3C 0C 0EF6           480        MVI   R3CHL,X'0C'            .SET UP FOR HALT 0C
   0EB3 3C F0 6187           481        MVI   XFLAG,X'F0'            .SET FLAGS                    *
   0EB7 0D 00 0DE8 0D8D      482        CLC   HOLD1-1(1),HOLD2-1     .SEE IF HI BYTE CHANGED
   0EBD F2 81 11             483        JE    R3CE                   .ERROR IF NOT
   0EC0 0D 00 0DEC 0D8E      484        CLC   HOLD1(1),HOLD2         .SEE IF LO BYTE CHANGED
   0EC6 F2 01 30             485        JNE   R3RST1                 .CONTINUE IF IT CHANGED
   0EC9 3C 0D 0EF6           486        MVI   R3CHL,X'0D'            .SET FOR HALT 0D
   0ECD 3C 0F 6187           487        MVI   XFLAG,X'0F'            .SET FLAGS                    *
   0ED1 0C 00 0EE8 0EA6      488 R3CE   MVC   R3CHL1(1),R3CNL        .SET HALT CODE
   0ED7 0C 01 0D53 5ACB      489        MVC   HDBA(2),WUN            .SET UP ADDR FOR PRINT
   0EDD 0C 01 5FE6 0D8C      490        MVC   STATAC(2),HOLD1        .MOVE 1ST RESULTS TO STATAC
   0EE3 C0 87 5DA5           491 R3EPC1 B     STATUS                 .GO PRINT ERROR
   0EE7 81                   492        DC    XL1'81'                .PRINT HDB ADDR, EXP, ACT NO HLT
   0EE8 00                   493 R3CNL1 DC    XL1'00'                .ERROR HALT -0B-  -0C-  OR -0D-
   0EE9 0000                 494        DC    XL2'0000'              .1ST EXP. RESULT
   0EEB 0C 01 5FE6 0D8E      495        MVC   STATAC(2),HOLD2        .MOVE 2ND RESULT TO STATAC
   0EF1 C0 87 5DA5           496        B     STATUS                 .GO PRINT 2ND ERROR
   0EF5 80                   497        DC    XL1'80'                .PRINT HDB ADDR, EXP, ACT
   0EF6 00                   498 R3CNL  DC    XL1'00'                .ERROR HALT -0B-  -0C-  OR  -0D-
   0EF7 FFFF                 499        DC    XL2'FFFF'              .EXPECTED 2ND RESULT
   0EF9 3C 00 6187           500 R3RST1 MVI   XFLAG,0                .RESET FLAGS                  *
                             501
   0EFD F3 58 80             502 R3CISA SIO   X'80',SIO1             .DISABLE TC RESET
   0F00 F3 58 C0             503        SIO   X'C0',SIO1             .ENABLE ATTACHMENT
   0F03 5C 01 71 F6          504 R3C000 MVC   R3CDT1(2,XR1),ZEROC(,XR1) .USE ZERO FOR DATA
   0F07 F2 87 24             505        J     R3CK15                 .GO LOAD HDB'S
   0F0A 5C 01 71 EF          506 R3CFFF MVC   R3CDT1(2,XR1),XCFFF(,XR1) .USE FFFF AS DATA
   0F0E F2 87 1D             507        J     R3CK15
   0F11 5C 01 71 EB          508 R3CA55 MVC   R3CDT1(2,XR1),XCA55(,XR1) .USE AA55 AS DATA
   0F15 F2 87 16             509        J     R3CK15
   0F18 5C 01 71 ED          510 R3C5AA MVC   R3CDT1(2,XR1),XC5AA(,XR1) .USE 55AA AS DATA
   0F1C F2 87 0F             511        J     R3CK15
   0F1F 5C 01 71 F1          512 R3C202 MVC   R3CDT1(2,XR1),XC202(,XR1) .USE 0202 AS DATA
   0F23 F2 87 08             513        J     R3CK15
   0F26 3C FF 0FF7           514 R3CINC MVI   INCFLC,X'FF'           .SET INCREMENT DATA FLAG
   0F2A 5C 01 71 F3          515        MVC   R3CDT1(2,XR1),HDBSTC(,XR1)  .INITIALIZE DATA
                             516
   0F2E 7C 88 2F             517 R3CK15 MVI   R3CK16+1(,XR1),X'88'    .SET UP TO LOAD HDB'S
   0F31 71 00 71             518 R3CK16 LID   R3CDT1(,XR1),*-*        .LOAD ALL HDB'S WITH DATA
   0F34 79 FF F4             519        TBF   INCFLC(,XR1),X'FF'      .TEST FOR INCREMENTING DATA
   0F37 F2 10 04             520        JT    R3CK21                 .JUMP IF NOT
   0F3A 5E 01 71 F1          521        ALC   R3CDT1(2,XR1),XC202(,XR1) .IF SO INCREMENT DATA
   0F3E 5E 00 2F E5          522 R3CK21 ALC   R3CK16+1(,XR1),R3CONE(1,XR1)
   0F42 7D 8F 2F             523        CLI   R3CK16+1(,XR1),X'8F'    EXIT WHEN ALL HDB'S LOADED
   0F45 D0 04 2E             524        BNH   R3CK16(,XR1)             IF NOT, GO LOAD NEXT HDB'S.
                             525
   0F48 5C 01 E9 F3          526        MVC   HDBAC(2,XR1),HDBSTC(,XR1) .INITIALIZE HDB ADDRESSES
```

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ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	
	0F4C	7C 00 57		527	MVI R3CK17+1(,XR1),X'00'	.SET UP TO SENSE HDB'S
	0F4F	78 FF F4		528	TBN INCFLC(,XR1),X'FF'	.TEST FOR INCREMENTING DATA
	0F52	F2 90 04		529	JF R3CK17	.JUMP IF NOT
	0F55	9C 01 F1 F3		530	MVC R3CDT1(2,XR1),HDBSTC(,XR1)	.INITIALIZE EXP. DATAIFINCR.
	0F59	30 00 0F86		531 R3CK17	SNS STATAC,X'00'	.SENSE HDB'S
	0F5D	C1 8A 1088		532	TIO R3CERR,HDBCHK	.ERROR IF HDB CHK
	0F61	1D 01 0F86 71		533	CLC STATAC,R3CDT1(2,XR1)	.COMPARE FOR EXPECTED DATA
	0F66	F2 81 0C		534	JE R3CK18	IF YES. CONTINUE.IF NOT. ERROR.
	0F69	C0 87 1058		535	B R3CERR	
				536		
	0F6D	C0 87 0DA5		537 R3CPRT	B STATUS	
	0F71	80	0F71	538	DC XL1'00'	.PRINT HDB ADDR. EXP & ACT DATA
	0F72	11	0F72	539	DC XL1'11'	.ERROR HALT -11-
	0F73	0000	0F74	540 R3CDT1	DC XL2'0000'	.EXPECTED DATA
				541		
	0F75	9E 00 57 E5		542 R3CK18	ALC R3CK17+1(,XR1),R3CONE(1,XR1)	
	0F79	5E 01 E9 F1		543	ALC HDBAC(,XR1),XC202(2,XR1)	.ADD ONE TO HDB ADDRESS
	0F7D	78 FF F4		544	TBF INCFLC(,XR1),X'FF'	.TEST FOR NOT INCREMENTING DATA
	0F80	F2 10 04		545	JT R3CK22	.IF NOT CONTINUE
	0F83	9C 01 71 E9		546	MVC R3CDT1(2,XR1),HDBAC(,XR1)	.IF SO MOVE IN NEXT DATA
	0F87	7D 8F 57		547 R3CK22	CLI R3CK17+1(,XR1),X'8F'	.EXIT WHEN ALL HDB'S SENSED
	0F8A	D0 04 56		548	BNH R3CK17(,XR1)	.IF NOT GO SENSE NEXT HDB'S
				549		
	0F8D	C1 8A 104C		550	TIO R3CB09,HDBCHK	.ERROR IF HDB CHECK
	0F91	38 80 020A		551	TBN BYTE2,SSW10	.PRINT IF SSW 10 IS ON
	0F95	F2 90 0E		552	JF R3CK19	.CONTINUE IF NOT
	0F98	78 10 F3		553	TBN HDBSTC(,XR1),X'10'	.TEST FOR DOING HI HDB'S
	0F9B	C0 10 1084		554	BT HDBH1	.PRINT HI HDB'S
	0F9F	79 10 F3		555	TBF HDBSTC(,XR1),X'10'	.TEST FOR DOING LO HDB'S
	0FA2	C0 10 1096		556	BT HDBL1	.GO PRINT LO HDB'S
				557		
	0FA6	5D 01 71 F6		558 R3CK19	CLC R3CDT1(2,XR1),ZEROC(,XR1)	.CHECK FOR DATA = 0000
	0FAA	D0 81 07		559	BE R3CFFF(,XR1)	.IF SO USE DATA = FFFF
	0FAD	5D 00 70 EF		560	CLC R3CDT1-1(1,XR1),XCFFF(,XR1)	.CHECK FOR DATA = FFFF
	0FB1	D0 81 0E		561	BE R3CA55(,XR1)	.IF SO USE DATA = AA55
	0FB4	5D 00 70 EA		562	CLC R3CDT1-1(1,XR1),XCA55-1(,XR1)	.CHECK FOR DATA = AA55
	0FB8	D0 81 15		563	BE R3C5AA(,XR1)	.IF SO USE DATA = 55AA
	0FBB	5D 00 70 EC		564	CLC R3CDT1-1(1,XR1),XC5AA-1(,XR1)	.CHECK FOR DATA = 55AA
	0FBF	D0 81 1C		565	BE R3C202(,XR1)	.IF SO USE DATA = 0202
	0FC2	5D 00 70 F1		566	CLC R3CDT1-1(1,XR1),XC202(,XR1)	.CHECK FOR DATA = 0202
	0FC6	D0 81 23		567	BE R3CINC(,XR1)	.IF SO USE INCR. DATA
				568		
				568		
	0FC9	79 10 F3		569	TBF HDBSTC(,XR1),X'10'	.TEST FOR DOING LO HDB'S
	0FCC	F2 10 0E		570	JT R3CK20	.IF SO, EXIT
	0FCF	4C 01 F3 0FEA		571	MVC HDBSTC(2,XR1),X2021	.SET UP FOR LO HDB'S
	0FD4	7C 00 F4		572	MVI INCFLC(,XR1),X'00'	.RESET THE INCREMENT FLAG
	0FD7	F3 58 80		573	SIO X'80',SIOI	.DISABLE ATTACHMENT AND GO
	0FDA	D0 87 80		574	B R3C000(,XR1)	TEST THE LO HDB'S
				575		
				576		
	0FDD	3D 42 0A03		577 R3CK20	CLI PRTN,X'42'	.TEST FOR ROUTINE 42
	0FE1	C0 81 4FBA		578	BE R40R1	.IF SO, RETURN TO ROUTINE 42
	0FE5	F2 87 39		579	J R3CEND	.GO CHECK HDB 20-21 NOT CHANGED
				580		
				580		
				581 **********		
				582 * CONSTANTS **********		
				583 **********		
				584		
	0FE8	01	0FE8	585 R3CONE	DC XL1'01'	
	0FE9	2021	0FEA	586 X2021	DC XL2'2021'	.WORK CONSTANT
	0FEB	0000	0FEC	587 HDBAC	DC XL2'0'	HDB ADD.
	0FED	AA55	0FEE	588 XCA55	DC XL2'AA55'	-AA55-
	0FEF	55AA	0FF0	589 XC5AA	DC XL2'55AA'	-55AA-
	0FF1	FFFF	0FF2	590 XCFFF	DC XL2'FFFF'	-FFFF-
	0FF3	0202	0FF4	591 XC202	DC XL2'0202'	-0202-

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ERR	LOC	OBJECT CODE	ADDR	STMT	SOURCE STATEMENT	
	0FF5	0000	0FF6	592 HDBSTC	DC XL2'0'	
	0FF7	00	0FF7	593 INCFLC	DC XL1'0'	
	0FF8	0000	0FF9	594 ZEROC	DC XL2'0000'	
	0FFA	3031	0FFB	595 X3031	DC XL2'3031'	
				596		
	0FFC	D9C8E4E340F0F4C4	1020	597 RT3CST	DC CL37'RDUT = OP-0BC LBND & HDB TEST (20-3F)'	
	1004	D760C4C3C340D3D6		597		
	100C	C1C4C4C040C6C4C2		597		
	1014	40E3C5E2E2404DF2		597		
	101C	F060F3C650		597		
	1021	F3 58 C0		598 R3CEND	SIO X'C0',SIOI	.ENABLE ATTACHMENT
	1024	30 88 0F86		599	SNS STATAC,X'88'	.SENSE HDB 30-31
	1028	0D 01 0F86 0FFB		600	CLC STATAC(2),X3031	.CHECK THAT IT DID NOT CHANGE
	102E	C0 81 0216		601	BE LINK	.TERMINATE ROUTINE IF OKAY.
	1032	0C 01 0DB3 0FFB		602	MVC HDBA(2),X3031	.SET UP HDB ADDRESS FOR PRINT
	1038	C0 87 0DA5		603	B STATUS	.GO PRINT ERROR
	103C	80	103C	604	DC XL1'80'	.PRINT HDB ADDR. EXP. ACT
	103D	12	103D	605	DC XL1'12'	.ERROR HALT -12-
	103E	3031	103F	606	DC XL2'3031'	.EXPECTED RESULT
				607		
				607		
				608 **********		
				609 * ERRORS **********		
				610 **********		
				611		
	1040	C0 87 5B72		612 R3CEPA	B PRINTN	
	1044	0E	1044	613	DC XL1'0E'	.ERROR HALT -0E-
	1045	11	1045	614	DC IL1'17'	
	1046	0E01	1047	615	DC AL2(OPDECF)	
	1048	C0 87 0E45		616	B R3CK03+4	
				617		
	104C	C0 87 5B72		618 R3CE09	B PRINTN	ATTACHMENT CHECK
	1050	10	1050	619	DC XL1'10'	.ERROR HALT -10-
	1051	10	1051	620	DC IL1'16'	
	1052	6047	1053	621	DC AL2(STATUS)	
	1054	C0 87 0FA6		622	B R3CK19	
				623		
				623		
	1058	3C 00 6188		624 R3CERR	MVI YFLAG,X'00'	
	105C	0D 00 5FE5 5F56		625	CLC STATAC-1(1),STATAC	HI=LO OF ACTUAL?
	1062	C0 81 0F6D		626	BE R3CPRT	BR IF SO
	1066	0E 00 5FE5 5609		627	ALC STATAC-1(1),X0001	INC ACTUAL HI
	106C	0D 80 5FE5 5F86		628	CLC STATAC-1(1),STATAC	TRY AGAIN
	1072	C0 81 107A		629	BE R3CACP	
	1076	3C FF 6188		630	MVI YFLAG,X'FF'	
	107A	0F 00 5FE5 5609		631 R3CACP	SLC STATAC-1(1),X0001	RESTORE ACTUAL
	1080	C0 87 0F6D		632	B R3CPRT	
				633 **********		
				634 * HDBH - HDBL *		*
				635 ********** SUBROUTINE LISTS CONTENTS OF SELECTED HDB'S		*
				636 * CALL SUBROUTINE BY -		*
				637 * B HDBH LISTS HI HDB'S		*
				638 *		*
				639 * B HDBL LISTS LO HDB'S		*
				640 *		*
				641 **********		
				642		
	1084	34 08 1115		643 HDBH1	ST SARR1+3,ARR	.SAVE RETURN ADDRESS
	1088	34 01 110D		644	ST SXR11+3,XR1	.SAVE XR1
	108C	C2 01 1191		645	LA HDNGA1,XR1	.LOAD HI HDB HEADING ADDRESS
	1090	F3 58 C0		646	SIO X'C0',SIOI	.ENABLE ATTACHMENT
	1093	F2 87 0F		647	J STND1	.GO STORE HEADING ADDRESS
				648		
	1096	34 08 1115		649 HDBL1	ST SARR1+3,ARR	.SAVE RETURN ADDRESS
	109A	34 01 110D		650	ST SXR11+3,XR1	.SAVE XR1

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ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

   109E C2 01 1158           651        LA    MDNG1,XR1          .LOAD LO MDB HEADING ADDRESS
   10A2 F3 58 80             652        SIO   X'80'.SIOI         .DISABLE ATTACHMENT
   10A5 34 01 10D8           653 STHD1  ST    MDADR1,XR1         .PUT ADDRESS IN PRINT COMMAND
                             654
   10A9 30 86 1117           655        SNS   MD11,X'86'         STORE ALL 16 MDB'S
   10AD 30 89 1119           656        SNS   MD21,X'89'
   10B1 30 8A 111B           657        SNS   MD31,X'8A'
   10B5 30 8B 111D           658        SNS   MD41,X'8B'
   10B9 30 8C 111F           659        SNS   MD51,X'8C'
   10BD 30 8D 1121           660        SNS   MD61,X'8D'
   10C1 30 8E 1123           661        SNS   MD71,X'8E'
   10C5 30 8F 1125           662        SNS   MD81,X'8F'
                             663
   10C9 C0 87 021A           664        B     PRINT              .PRINT MDB'S HEADINGS.
   10CD 81           10CD    665        DC    XL1'81'
   10CE 0C           10CE    666        DC    IL1'12'
   10CF 11D4         10D0    667        DC    AL2(MDNGM1)
   10D1 C0 87 021A           668        B     PRINT
   10D5 81           10D5    669        DC    XL1'81'
   10D6 36           10D6    670        DC    IL1'54'
   10D7 1158         10D8    671 MDADR1 DC    AL2(MDNG1)
                             672
   10D9 C2 01 119A           673        LA    MDNGB1-45,XR1      .XR1 = 1ST MDB POSITION
   10DD C2 02 1116           674        LA    MD11-1,XR2         .XR2 = 1ST MDB DATA
                             675
   10E1 34 01 10F1           676 AGAIN1 ST    RY11,XR1           .STORE UNPACK DEST. ADDR
   10E5 34 02 10EF           677        ST    RY21,XR2           .STORE UNPACK SOURCE ADDR
   10E9 C0 87 021E           678        B     UNPACK             .GO UNPACK ONE MDB
   10ED 01           10ED    679        DC    XL1'01'
   10EE 0000         10EF    680 RY21   DC    AL2(*-*)           .SOURCE ADDRESS GETS FILLED IN
   10F0 0000         10F1    681 RY11   DC    AL2(*-*)           .DEST. ADDRESS GETS FILLED IN
                             682
   10F2 E2 02 01             683        LA    1(,XR2),XR2        .INCREMENT DATA ADDRESS
   10F5 7D FF 01             684        CLI   1(,XR1),X'FF'      .TEST FOR END
   10F8 F2 81 07             685        JE    DONIS1             .JUMP IF SO
   10FB D2 01 03             686        LA    3(,XR1),XR1        .NOT END. INCR. XR1 TO NEXT ADDR
   10FE C0 87 10E1           687        B     AGAIN1             .LOOP
                             688
   1102 C0 87 021A           689 DONIS1 B     PRINT              .GO PRINT MDB'S
   1106 86           1106    690        DC    XL1'86'
   1107 36           1107    691        DC    IL1'54'
   1108 11C7         1109    692        DC    AL2(MDNGB1)
   110A C2 01 0000           693 SXR11  LA    *-*,XR1            .RESTORE ALL REGS AND RETURN.
   110E C2 02 0000           694 SXR21  LA    *-*,XR2
   1112 C0 87 0000           695 SARR1  B     *-*
                             696
   1116 0000         1117    697 MD11   DC    XL2'0000'
   1118 0000         1119    698 MD21   DC    XL2'0000'
   111A 0000         111B    699 MD31   DC    XL2'0000'
   111C 0000         111D    700 MD41   DC    XL2'0000'
   111E 0000         111F    701 MD51   DC    XL2'0000'
   1120 0000         1121    702 MD61   DC    XL2'0000'
   1122 0000         1123    703 MD71   DC    XL2'0000'
   1124 0000         1125    704 MD81   DC    XL2'0000'
   1126 C1C4C4D940604C 112C  705        DC    CL7'ADDR - '
   112D F2F040F2F14CF2F2 1158 706 MDNG1  DC    CL47'20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F'
   1135 40F2F340F2F44CF2     706
   113D F540F2F640F2F740     706
   1145 F2F840F2F940C1       706
   114D 40F2C240F2C340F2     706
   1155 C440F2C540F2C6       706
   115C C1C4C4D940604C 1162  707        DC    CL7'ADDR - '
   1163 F3F040F3F140F3F2 1191 708 MDNGA1 DC    CL47'30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F'
   1168 40F3F340F3F44CF3     708
   1173 F540F3F640F3F740     708
   117B F3F840F3F940C1       708
   1183 40F3C240F3C340F3     708
   1188 C440F3C540F3C6       708
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ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

   1102 C4C1E3C1404040C      1100 709        DC    CL7'DATA - '
   1109 E7E740E7E7E740E3E7 11C7 710 MDNGB1 DC    CL47'XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX'
   11A1 40E7E740E7E740E7     710
   11A9 E740E7E740E7E740     710
   11B1 E7E740E7E740E3E7     710
   11B9 40E7E740E7E740E7     710
   11C1 E740E7E740E7E7E3     710
   11C8 FF           11C8    711        DC    XL1'FF'
   11C9 C8C4C240C3D6D4E3 11D4 712 MDNGM1 DC    CL12'MDB CONTENTS'
   11D1 C5D8E3E2             713
   11D5 0000         11D6    713 MDXX1  DC    XL2'0000'
                             714
                             715 ********************************************************************
                             716 *      ROUTINE 6 - MIAR REGISTER INCREMENT TEST                    *
                             717 ********************************************************************
                             718 *                                                                  *
                             719 *           LOAD CONTROL STORAGE TO CHECK FOR ADDRESS               *
                             720 *           INCREMENTING. THE DATA BEING LOADED IS UNIMPORTANT.     *
                             721 *           HOWEVER, THE ADDRESS SHOULD INCREMENT                  *
                             722 *           ONLY THE INCREMENT OF THE LO 8 BITS OF ADDRESS ARE      *
                             723 *           CHECKED BY THIS ROUTINE.  THIS IS DONE BY SENSING MDB  *
                             724 *           IF SINCE MIAR GETS DUMPED INTO IT EACH MACHINE CYCLE.  *
                             725 *                                                                  *
                             726 ********************************************************************
                             727
   11D7 06           11D7    728 RT06   DC    XL1'06'            ROUTINE -06-.
   11D8 00           11D8    729        DC    XL1'00'            NO MANUAL INTERVENTION.
   11D9 1287         11DA    730        DC    AL2(RT07)          NEXT ROUTINE.
                             731
   11DB C0 87 021A           732        B     PRINT
   11DF 01           11DF    733        DC    XL1'01'
   11E0 19           11E0    734        DC    IL1'25'
   11E1 1284         11E2    735        DC    AL2(RT4ST)
                             736
                     11E7    737        USING R04K01,XR1
   11E3 C2 01 11E7           738        LA    R04K01,XR1         .LOAD XR1 FOR INDEXING
                             739
   11E7 7C 00 64             740 R04K01 MVI   R04EXP(,XR1),X'00'  .INITIALIZE COUNT
   11EA 5F 01 82 82          741        SLC   R04CNT(2,XR1),R04CNT(,XR1)  .ZERO THE COUNT
   11EE F3 58 80             742        SIO   X'80'.SIOI         .DISABLE ATTACHMENT
   11F1 F3 58 C0             743        SIO   X'C0'.SIOI         .ENABLE ATTACHMENT
   11F4 31 4F 0D62           744        LIO   ZERO,MDB7          .SET MDB 1E-1F = 0
   11F8 30 4F 5FE6           745 R04K02 SNS   STATAC,MDB7        .SENSE MDB 1E-1F
   11FC 4D 00 64 5FE6        746        CLC   R04EXP(1,XR1),STATAC .CHECK FOR CORRECT VALUE
   1201 F2 81 48             747        JE    R04K02             .JUMP IF OKAY
   1204 3C 00 6187           748        MVI   XFLAG,X'00'
   1208 3C 00 6188           749        MVI   YFLAG,X'00'
   120C 3C 00 6189           750        MVI   ZFLAG,X'00'
   1210 3D 01 1248           751        CLI   R04EXP,X'01'       EXPECTED=01?
   1214 C0 81 1220           752        BE    R04RTR
   1218 3C FF 6188           753        MVI   YFLAG,X'FF'
   121C C0 87 1244           754        B     R04ERR
                             755
                             756 * EXPECTED VALUE 01 NOT ACHIEVED. CAN ACTUAL VALUE BE INCREMENTED?
   1220 31 58 0D62           757 R04RTR LIO   ZERO,CTSTOR
   1224 30 4F 1286           758        SNS   TRYTWO,MC87
   1228 0F 00 1286 5609      759        SLC   TRYTWO(1),X0001
   122E 0D 00 1286 5FB6      760        CLC   TRYTWO(1),STATAC     PREV ACTUAL VALUE INCREMENTED?
   1234 C0 81 1240           761        BE    R04ZZ              BR IF SO. TO RBPL ACT W/Z
   1238 3C FF 6188           762        MVI   YFLAG,X'FF'        SET Y-FLAG. REJECT 1ST ACT
   123C C0 87 1244           763        B     R04ERR
   1240 3C FF 6189           764 R04ZZ  MVI   ZFLAG,X'FF'
                             765
   1244 C0 87 5DA5           766 R04ERR B     STATUS             .ERROR. GO PRINT
   1248 04           1248    767        DC    XL1'04'            .PRINT MIAR INCR ERR
   1249 13           1249    768        DC    XL1'13'            .ERROR HALT -13-
   124A 0000         124B    769 R04EXP DC    XL2'0'             .EXPECTED RESULT GETS FILLED IN
                             770
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ERR LOC OBJECT CODE       ADDR STNT SOURCE STATEMENT

    124C 4E 00 64 5A08          771 R04K02 ALC    R04EXP(1.XR1).WUN           .INCREMENT EXPECTED RESULT
    1251 4E 01 82 5A08          772        ALC    R04CNT42.XR1).WUN           .INCREMENT COUNT
    1256 5D 01 82 84            773        CLC    R04CNT(2.XR1).R04END(.XR1)   .CHECK FOR END
    125A F2 81 07               774        JE     R04K07                      .IF EQUAL. TEST IS OVER
    125D 31 58 0D62             775        LIO    ZERO.CTSTOR                 .LOAD CONTROL STORE TO MAKE
                                776 *                                          MIAR INCREMENT
    1261 D0 87 11               777        B      R04K03(.XR1)                .LOOP BACK
                                778
    1264 C0 87 0216             779 R04K07 B      LINK                        .GO TO NEXT ROUTINE
                                780
                                780
    1268 0000              1269 781 R04CNT DC     XL2'0'                      .COUNTER
    126A 0101              1268 782 R04END DC     XL2'0101'                   .STOP INDICATOR
                                783
                                783
    126C D9D6E4E340F64 0D4 1284 784 RT4ST  DC     CL25'ROUT 6 MIAR REG INCR TEST'
    1274 C9C1D940D9C5C740       784
    127C C9D5C3D940E3C5E2       784
    1284 E3                     784
    1285 0000              1286 785 TRYTWO DC     XL2'00'
                                786 ***************************************************************
                                787 *      ROUTINE 7 - LIO/SNS MICROCONTROL STORAGE TEST          *
                                788 ***************************************************************
                                789 *                                                             *
                                790 *  LOADS AND SENSES FET STORAGE CARDS (FSC) WITH FOLLOWING DATA *
                                791 *             PART 1: FSC1.2.3 WITH -0000-                    *
                                792 *             PART 2: FSC1.2.3 WITH -FFFF-                    *
                                793 *             PART 3: FSC1 WITH -0100- TO -01FF-              *
                                794 *                     FSC2 WITH -0200- TO -02FF-              *
                                795 *                     FSC3 WITH -0400- TO -04FF-              *
                                796 *                                                             *
                                797 *      SETTING SENSE SWITCH 12 ON CAUSES THE CONTENTS OF CONTROL *
                                798 *      STORAGE TO BE PRINTED OUT AFTER EACH SENSE OF 256 WORDS *
                                799 *                                                             *
                                800 ***************************************************************
                                801
    1287 07                1287 802 RT07   DC     XL1'07'                ROUTINE 7
    1288 00                1288 803        DC     XL1'0'                 NO MANUAL INTERVENTION
    1289 173C              128A 804        DC     AL2(RT08)              NEXT ROUTINE
                                805
    128B C0 87 021A             806        B      PRINT                  PRINT ROUTINE HEADING
    128F 01                128F 807        DC     XL1'01'
    1290 17                1290 808        DC     IL1'23'
    1291 5917              1292 809        DC     AL2(RT5ST)             LIO/SNS MC STORE
                                810
    1293 3C 10 566F             811        MVI    R05SF1.X'10'                 .INITIALIZE FLAG
    1297 3C 00 6187             812        MVI    XFLAG.X'00'
    129B 3C 00 6188             813        MVI    YFLAG.X'00'
    129F 3C 00 6189             814        MVI    ZFLAG.X'00'
    12A3 F3 58 80               815        SIO    X'80'.SIOI                  .DISABLE ATTACHMENT
    12A6 F3 58 C0               816        SIO    X'C0'.SIOI                  .ENABLE ATTACHMENT
    12A9 31 58 0D62             817        LIO    ZERO.CTSTOR                 .ATTEMPT TO PUT ZERO IN C.S.
    12AD F3 58 80               818        SIO    X'80'.SIOI                  .DISABLE ATTACHMENT
    12B0 F3 58 C0               819        SIO    X'C0'.SIOI                  .ENABLE ATTACHMENT
    12B3 30 58 0DEC             820        SNS    HOLD1.CTSTOR                .SENSE ADDRESS ZERO
    12B7 F3 58 80               821        SIO    X'80'.SIOI                  .DISABLE ATTACHMENT
    12BA F3 58 C0               822        SIO    X'C0'.SIOI                  .ENABLE ATTACHMENT
    12BD 31 58 0D59             823        LIO    XFFFF.CTSTOR                .ATTEMPT TO PUT FFFF IN C.S.
    12C1 F3 58 80               824        SIO    X'80'.SIOI                  .DISABLE ATTACHMENT
    12C4 F3 58 C0               825        SIO    X'C0'.SIOI                  .ENABLE ATTACHMENT
    12C7 30 58 0DEE             826        SNS    HOLD2.CTSTOR                .SENSE ADDRESS ZERO
    12CB 0D 01 0DEC 0DEE        827        CLC    HOLD1(2).HOLD2              .SEE IF C.S. CHANGED AT ALL
    12D1 3C 14 1323             828        MVI    R5HLT.X'14'                 .SET UP HALT 14
    12D5 3C FF 6187             829        MVI    XFLAG.X'FF'                 .SET FLAG                        *
    12D9 F2 81 22               830        JE     R5PO                        .ERROR IF NO CHANGE IN C.S.
    12DC 0D 00 0DEB 0DED        831        CLC    HOLD1-1(1).HOLD2-1          .SEE IF HI BYTE CHANGED
    12E2 3C 15 1323             832        MVI    R5HLT.X'15'                 .SET UP HALT 15
    12E6 3C F0 6187             833        MVI    XFLAG.X'F0'                 .SET FLAG                        *
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ERR LOC OBJECT CODE       ADDR STNT SOURCE STATEMENT

    12EA F2 81 11               834        JE     R5PO                        .ERROR IF NO CHANGE IN HI BYTE
    12ED 0D 00 0DEC 0DEE        835        CLC    HOLD1(1).HOLD2              .SEE IF LO BYTE CHANGED
    12F3 F2 01 30               836        JNE    R05SF                       .GO START MAIN ROUT. IF CHANGE
    12F6 3C 16 1323             837        MVI    R5HLT.X'16'                 .SET UP HALT 16
    12FA 3C 0F 6187             838        MVI    XFLAG.X'0F'                 .SET FLAG                        *
    12FE 0C 00 1315 1323        839 R5PO   MVC    R5HLT1(1).R5HLT             .INSERT HALT CODE
    1304 0F 01 5673 5673        840        SLC    R05W01(2).R05W01            .SET ADDRESS TO ZERO
    130A 0C 01 5FE6 0DEC        841        MVC    STATAC(2).HOLD1             .MOVE 1ST RESULT TO STATAC
    1310 C0 87 5DA5             842        B      STATUS                      .GO PRINT 1ST RESULT
    1314 41                1314 843        DC     XL1'41'                     .PRINT CS ADDR. EXP. ACT AND HALT
    1315 00                1316 844 R5HLT1 DC     XL1'00'                     .ERROR HALT -14- -15- OR -16-
    1316 0000              1317 845        DC     XL2'0000'                   .1ST EXP. RESULT
    1318 0C 01 5FE6 0DEE        846        MVC    STATAC(2).HOLD2             .MOVE 2ND RESULT TO STATAC
    131E C0 87 5DA5             847 R5E14  B      STATUS                      .GO PRINT 2ND RESULT
    1322 40                1322 848        DC     XL1'40'                     .PRINT CS ADDR. EXP. ACT
    1323 00                1323 849 R5HLT  DC     XL1'00'                     .ERROR HALT -14- -15- OR -16-
    1324 FFFF              1325 850        DC     XL2'FFFF'                   .2ND EXP. RESULT
    1326 3C 00 6187             851 R5RSF  MVI    XFLAG.0                     .RESET FLAG                      *
                                852
    132A 3C C0 134C             853 R05ST  MVI    R05FS1+2.X'C0'              .SET UP FOR 1ST STG
    132E 3C C0 1391             854        MVI    R05FS2+2.X'C0'
    1332 3C 18 1448             855        MVI    R05HC.X'18'                 .SET HALT CODE 18
    1336 3C 80 566F             856 R05RST MVI    R05SF1.X'80'                .LOAD ALL CS WITH -0000-
    133A C2 02 0000             857 R05K01 LA     0.XR2                       .USE XR2 AS CS ADDRESS COUNTER
    133E 34 02 5673             858        ST     R05W01.XR2                  .INITIALIZE ADDRESS AT ZERO
    1342 C0 87 16CA             859        B      R05SPC                      .SET UP COUNTERS FOR FS01
    1346 80                1346 860        DC     XL1'80'
                                861
    1347 F3 58 80               862        SIO    X'80'.SIOI                  DISABLE ATTACHMENT
    134A F3 58 C0               863 R05FS1 SIO    X'C0'.SIOI                  ENABLE ATTACHMENT
    134D 30 4F 16C2             864        SNS    R05INC.HDB7                 .INITIALIZE INC. DATA
    1351 3C 01 16C2             865        MVI    R05INC.1
    1355 31 58 1898             866 R05K02 LIO    R05SSC.CTSTOR               LOAD CS WITH PRE-DEFINED DATA
    1359 C1 5E 1691             867        TIO    R05LPR.FETWRD               .TEST FOR WRITE DATA CHECK
    135D C1 5C 1691             868        TIO    R05LPR.FETADR               .TEST FOR ADDRESS CHECK
    1361 30 4F 5FE6             869        SNS    STATAC.HDB7                 .SENSE HDB 1E-1F
    1365 0D 00 5FE6 16C2        870        CLC    STATAC(1).R05INC            .CHECK MIAR CORRECT
    136B C0 01 1688             871        BNE    R5INCE                      .GO TO ERROR IF NOT
    136F 0E 00 16C2 5AC8        872        ALC    R05INC(1).WUN               .INCREMENT EXPECTED DATA
    1375 0E 01 1898 5632        873        ALC    R05SSC.R05SIN(2)            .INCREMENT DATA FOR NEXT CS LOC
    137B E2 02 01               874        LA     1(.XR2).XR2                 .INCREMENT ADDRESS COUNTER &
    137E 34 02 5673             875        ST     R05W01.XR2                   CHECK IF AT END OF 3RD STG CD.
    1382 0D 01 5673 56E5        876        CLC    R05W01.X0BFF                 IF NOT. LOAD NEXT CS LOCATION.
    1388 C0 04 1355             877        BNH    R05K02
    138C F3 58 80               878 R05K96 SIO    X'80'.SIOI                  DISABLE ATTACHMENT
    138F F3 58 C0               879 R05FS2 SIO    X'C0'.SIOI                  ENABLE ATTACHMENT
    1392 C2 32 0000             880 R05K07 LA     0.XR2                       .USE XR2 AS CS ADDRESS COUNTER
    1396 34 02 5673             881        ST     R05W01.XR2                  .INITIALIZE ADDRESS AT ZERO
    139A C2 01 5701             882        LA     R05W18.XR1                  .USE XR1 AS CS SNS DATA POINTER
    139E C0 87 16CA             883        B      R05SPC                      .SET UP COUNTERS FOR FSO 1
    13A2 80                13A2 884        DC     XL1'80'
                                885
    13A3 30 58 5FE6             886 R05K08 SNS    STATAC.CTSTOR               SENSE CS.STORE IN SNS DATA
    13A7 4C 01 01 5FE6          887        MVC    1(2.XR1).STATAC              TABLE. & COMPARE TO EXPECTED
    13AC D2 01 02               888        LA     2(.XR1).XR1                  DATA.
                                889
    13AF C1 5D 13BC             890        TIO    R05SEX.ATTCHK               .IF ATT. CHK. GO PRINT
    13B3 0D 01 5FE6 1698        891        CLC    STATAC.R05SSC(2)            .COMPARE TO EXPECTED DATA?
    13B9 F2 81 92               892        JE     R05K09                      .IF YES. CONTINUE.IF NOT. ERROR.
    13BC 0C 01 144D 1698        893 R05SEX MVC    R05XD1.R05SSC(2)            .MOVE IN EXPECTED DATA
                                894
    13C2 3C 00 6188             895        MVI    YFLAG.X'00'
    13C6 3C 00 6189             896        MVI    ZFLAG.X'00'
    13CA 38 20 566F             897        TBN    R05SF1.X'20'                PART 3?
    13CE C0 10 1445             898        BT     R05ART                      BR IF SO
    13D2 0D 00 5FE5 5FE6        899        CLC    STATAC-1(1).STATAC          ACTUAL HI=ACTUAL LOW?
    13D8 C0 81 13E4             900        BE     R05A00                      BR IF SO
    13DC 3C FF 6188             901        MVI    YFLAG.X'FF'                 SET Y-FLAG
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              902
 13E0 C0 87 1446              903         B     R05ART
                              904
 13E4 34 02 5673              905 R05A00  SI    R05W01,XR2
 13E8 9D 01 5673 2D8C         906         CLC   R05W01(2),X0000
 13EE C0 01 1446              907         BNE   R05ART
 13F2 3D 01 5FE6              908         CLI   STATAC,X'01'
 13F6 C0 81 1442              909         BE    R05ZZZ
 13FA 3D 02 5FE6              910         CLI   STATAC,X'02'
 13FE C0 81 1442              911         BE    R05ZZZ
 1402 3D 04 5FE6              912         CLI   STATAC,X'04'
 1406 C0 81 1442              913         BE    R05ZZZ
 140A 3D 08 5FE6              914         CLI   STATAC,X'08'
 140E C0 81 1442              915         BE    R05ZZZ
 1412 3D 10 5FE6              916         CLI   STATAC,X'10'
 1416 C0 81 1442              917         BE    R05ZZZ
 141A 3D 20 5FE6              918         CLI   STATAC,X'20'
 141E C0 81 1442              919         BE    R05ZZZ
 1422 3D 40 5FE6              920         CLI   STATAC,X'40'
 1426 C0 81 1442              921         BE    R05ZZZ
 142A 3D 80 5FE6              922         CLI   STATAC,X'80'
 142E C0 81 1442              923         BE    R05ZZZ
 1432 3D 00 5FE6              924         CLI   STATAC,X'00'
 1436 C0 81 1442              925         BE    R05ZZZ
 143A 3C FF 6188              926         MVI   YFLAG,X'FF'
 143E C0 87 1446              927         B     R05ART
                              928
 1442 3C FF 6189              929 R05ZZZ  MVI   ZFLAG,X'FF'
 1446 C0 87 5DA5              930 R05ART  B     STATUS
 144A 40              144A    931         DC    XL1'40'          .PRINT CS ADDR, EXP. ACT DATA
 144B 00              1448    932 R05HC   DC    XL1'00'          .ERROR HALT -18-  OR  -19-
 144C 0000            144D    933 R05XD1  DC    AL2(*-*)
                              934
 144E 0E 01 1698 5671         935 R05K09  ALC   R05SSC,R05SIN(2)  .INCREMENT EXPECTED DATA
 1454 E2 02 01                936         LA    1(,XR2),XR2
 1457 34 02 5673              937         ST    R05W01,XR2
 145B 9D 00 5673              938         CLI   R05W01,X'00'     END OF A GROUP OF 256?
 145F C0 01 13A3              939         BNE   R05K08           RTN FOR MORE IF NOT
 1463 C2 01 5701              940         LA    R05W1B,XR1       USE XR1 AS CS SNS DATA POINTER
 1467 9D 01 5672              941 ADR100  CLI   R05W01-1,X'01'    END OF 000-0FF?
 146B C0 84 1480              942         BH    ADR200           BRANCH IF NOT.
 146F 38 20 020A              943         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 1473 C0 90 13A3              944         BF    R05K08           BRANCH IF NOT.
 1477 C0 87 5567              945         B     R05DCS           BRANCH TO PRINT
 147B 80              147B    946         DC    XL1'80'           OUT 600-0FF
 147C C0 87 13A3              947         B     R05K08           RTN TO SNS NEXT 256
                              948
 1480 9D 02 5672              949 ADR200  CLI   R05W01-1,X'02'    END OF 100-1FF?
 1484 C0 84 1499              950         BH    ADR300           BRANCH IF NOT
 1488 38 20 020A              951         TBN   SBYTE2,SSW12     IS SSW12 ON?
 148C C0 90 13A3              952         BF    R05K08           BRANCH IF NOT
 1490 C0 87 5567              953         B     R05DCS           BRANCH TO PRINT
 1494 40              1494    954         DC    XL1'40'           OUT 100-1FF
 1495 C0 87 13A3              955         B     R05K08           RTN TO SNS NEXT 256
                              956
 1499 9D 03 5672              957 ADR300  CLI   R05W01-1,X'03'    END OF 200-2FF?
 149D C0 84 14B2              958         BH    ADR400           BRANCH IF NOT
 14A1 38 20 020A              959         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 14A5 C0 90 13A3              960         BF    R05K08           BRANCH IF NOT
 14A9 C0 87 5567              961         B     R05DCS           BRANCH TO PRINT
 14AD 20              14AD    962         DC    XL1'20'           OUT 200-2FF
 14AE C0 87 13A3              963         B     R05K08           RTN TO SNS NEXT 256
                              964
 14B2 9D 04 5672              965 ADR400  CLI   R05W01-1,X'04'    END OF 300-3FF?
 14B6 C0 84 14CB              966         BH    ADR500           BRANCH IF NOT
 14BA 38 20 020A              967         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 14BE C0 90 13A3              968         BF    R05K08           BRANCH IF NOT
 14C2 C0 87 5567              969         B     R05DCS           BRANCH TO PRINT
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 14C6 10              14C6    970         DC    XL1'10'           OUT 300-3FF
 14C7 C0 87 13A3              971         B     R05K08           RTN TO SNS NEXT 256
                              972
 14CB 9D 05 5672              973 ADR500  CLI   R05W01-1,X'05'    END OF 400-4FF?
 14CF C0 84 14E4              974         BH    ADR600           BRANCH IF NOT
 14D3 38 20 020A              975         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 14D7 C0 90 13A3              976         BF    R05K08           BR IF NOT
 14DB C0 87 5567              977         B     R05DCS           BR TO PRINT OUT
 14DF 8C              14DF    978         DC    XL1'8C'           400-4FF
 14E0 C0 87 13A3              979         B     R05K08           RTN TO SNS NEXT 256
                              980
 14E4 9D 06 5672              981 ADR600  CLI   R05W01-1,X'06'    END OF 500-5FF?
 14E8 C0 84 14FD              982         BH    ADR700           BR IF NOT
 14EC 38 20 020A              983         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 14F0 C0 90 13A3              984         BF    R05K08           BR IF NOT
 14F4 C0 87 5567              985         B     R05DCS           BR TO PRINT
 14F8 4C              14F8    986         DC    XL1'4C'           OUT 500-5FF
 14F9 C0 87 13A3              987         B     R05K08           RTN TO SNS NEXT 256
                              988
 14FD 9D 07 5672              989 ADR700  CLI   R05W01-1,X'07'    END OF 600-6FF?
 1501 C0 84 1516              990         BH    ADR800           BR IF NOT
 1505 38 20 020A              991         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 1509 C0 90 13A3              992         BF    R05K08           BR IF NOT
 150D C0 87 5567              993         B     R05DCS           BR TO PRINT
 1511 2C              1511    994         DC    XL1'2C'           OUT 600-6FF
 1512 C0 87 13A3              995         B     R05K08           RTN TO SNS NEXT 256
                              996
 1516 9D 08 5672              997 ADR800  CLI   R05W01-1,X'08'    END OF 700-7FF?
 151A C0 84 1537              998         BH    ADR900           BR IF NOT
 151E 38 20 020A              999         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 1522 C0 90 1528             1000         BF    FET3IN           BR IF NOT
 1526 C0 87 5567             1001         B     R05DCS           BR TO PRINT
 152A 1C              152A   1002         DC    XL1'1C'           OUT 700-7FF
 1528 38 02 0A0C             1003 FET3IN TBN    UDT2,X'02'       IS 3RD FET INSTALLED?
 152F C0 90 168D             1004         BF    R05JC1           BR IF NOT
 1533 C0 87 13A3             1005         B     R05K08           RTN TO SNS NEXT 256
                             1006
 1537 9D 09 5672             1007 ADR900 CLI    R05W01-1,X'09'   END OF 800-8FF?
 153B C0 84 1550             1008         BH    ADRA00           BR IF NOT
 153F 38 20 020A             1009         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 1543 C0 90 13A3             1010         BF    R05K08           BR IF NOT
 1547 C0 87 5567             1011         B     R05DCS           BR TO PRINT
 1548 8A              1548   1012         DC    XL1'8A'           OUT 800-8FF
 154C C0 87 13A3             1013         B     R05K08           RTN TO SNS NEXT 256
                             1014
 1550 9D 0A 5672             1015 ADRA00 CLI    R05W01-1,X'0A'   END OF 900-9FF?
 1554 C0 84 1569             1016         BH    ADRB00           BR IF NOT
 1558 38 20 020A             1017         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 155C C0 90 13A3             1018         BF    R05K08           BR IF NOT
 1560 C0 87 5567             1019         B     R05DCS           BR TO PRINT
 1564 4A              1564   1020         DC    XL1'4A'           OUT 900-9FF
 1565 C0 87 13A3             1021         B     R05K08           RTN TO SNS NEXT 256
                             1022
 1569 9D 0B 5672             1023 ADRB00 CLI    R05W01-1,X'0B'   END OF A00-AFF?
 156D C0 84 1582             1024         BH    ADRC00           BR IF NOT
 1571 38 20 020A             1025         TBN   SBYTE2,SSW12     IS SSW12 ON?
 1575 C0 90 13A3             1026         BF    R05K08           BR IF NOT
 1579 C0 87 5567             1027         B     R05DCS           BR TO PRINT
 157D 2A              1570   1028         DC    XL1'2A'           OUT A00-AFF
 157E C0 87 13A3             1029         B     R05K08           RTN TO SNS NEXT 256
                             1030
 1582 9D 0C 5672             1031 ADRC00 CLI    R05W01-1,X'0C'   END OF B00-BFF? END 3RD FET:
 1586 C0 84 1582             1032         BH    ADRC00           BR IF NOT
 158A 38 20 020A             1033         TBN   SBYTE2,SSW12     IS SSW 12 ON?
 158E C0 90 168D             1034         BF    R05JC1           BR IF NOT
 1592 C0 87 5567             1035         B     R05DCS           BR TO PRINT
 1596 1A              1596   1036         DC    XL1'1A'           OUT B00-BFF
 1597 C0 87 168D             1037         B     R05JC1
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ERR LOC OBJECT CODE        ADDR STNT SOURCE STATEMENT

    1598 0D 01 5673 56EB         1038        CLC    ROSW01,X00FF          .AT END OF FSQ 1?
    15A1 C0 04 15A3              1039        BNH    RO5K08                 IF NOT. GO SENSE AGAIN.
                                 1040
    15A5 38 20 020A              1041        TBN    SBYTE2,SSW12          .SSW 12 ON? IF YES. PRINT ALL
    15A9 F2 90 05                1042        JF     RO5K0A                 SENSED DATA FOR FSQ 1.
    15AC C0 87 5567              1043        B      RO5DCS                .DUMP 256 WORDS FROM FSQ 1
    15B0 80                 15B0 1044        DC     XL1'80'
                                 1045
    15B1 C2 01 5701              1046 RO5K0A LA     RO5W1B,XR1            .USE XR1 AS CS SNS DATA POINTER
    15B5 C0 87 16CA              1047        B      RO5SPC                .SET UP COUNTERS FOR FSQ 2
    15B9 40                 15B9 1048        DC     XL1'40'
                                 1049
    15BA 30 58 5FE6              1050 RO5K0B SNS    STATAC,CTSTOR         SENSE CS, STORE IN SNS DATA
    15BE 4C 01 01 5FE6           1051        MVC    1(2,XR1),STATAC        TABLE, & COMPARE TO EXPECTED
    15C3 D2 01 02                1052        LA     2(,XR1),XR1            DATA.
                                 1053
    15C6 C1 5D 138C              1054        TIO    RO5SEX,ATTCHK         .GO PRINT IF ATT. CHK.
    15CA 0D 01 5FE6 1698         1055        CLC    STATAC,RO5SSC(2)      .COMPARE TO EXPECTED DATA?
    15D0 C0 81 15D8              1056        BE     RO5K0C                .IF YES. CONTINUE.IF NOT. ERROR.
    15D4 C0 87 138C              1057        B      RO5SEX                .ERROR. GO PRINT
                                 1058
                                 1059
    15D8 0E 01 1698 5671         1060 RO5K0C ALC    RO5SSC,RO5SIN(2)      .INCREMENT EXPECTED DATA
    15DE E2 02 01                1061        LA     1(,XR2),XR2
    15E1 34 02 5673              1062        ST     RO5W01,XR2
    15E5 0D 01 5673 56ED         1063        CLC    RO5W01,X01FF          .AT END OF FSQ 2?
    15EB C0 04 15BA              1064        BNH    RO5K0B                 IF NOT. GO SENSE AGAIN.
                                 1065
    15EF 38 20 020A              1066        TBN    SBYTE2,SSW12          .SSW 12 ON? IF YES. PRINT ALL
    15F3 F2 90 05                1067        JF     RO5K0D                 SENSED DATA FOR FSQ 2.
    15F6 C0 87 5567              1068        B      RO5DCS                .DUMP 256 WORDS FROM FSQ 2
    15FA 40                 15FA 1069        DC     XL1'40'
                                 1070
    15FB C2 01 5701              1071 RO5K0D LA     RO5W1B,XR1            .USE XR1 AS CS SNS DATA POINTER
    15FF C0 87 16CA              1072        B      RO5SPC                .SET UP COUN,ERS FOR FSQ 3
    1603 20                 1603 1073        DC     XL1'20'
                                 1074
    1604 30 58 5FE6              1075 RO5K0E SNS    STATAC,CTSTOR         SENSE CS. STORE IN SNS DATA
    1608 4C 01 01 5FE6           1076        MVC    1(2,XR1),STATAC        TABLE. & COMPARE TO EXPECTED
    160D D2 01 02                1077        LA     2(,XR1),XR1            DATA.
                                 1078
    1610 C1 5D 138C              1079        TIO    RO5SEX,ATTCHK         .IF ATT. CHK. GO PRINT
    1614 0D 01 5FE6 1698         1080        CLC    STATAC,RO5SSC(2)      .COMPARE TO EXPECTED DATA?
    161A F2 81 04                1081        JE     RO5K0F                .IF YES. CONTINUE.IF NOT. ERROR.
    161D C0 87 138C              1082        B      RO5SEX                .GO PRINT ERROR
                                 1083
    1621 0E 01 1698 5671         1084 RO5K0F ALC    RO5SSC,RO5SIN(2)      .INCREMENT EXPECTED DATA
    1627 E2 02 01                1085        LA     1(,XR2),XR2
    162A 34 02 5673              1086        ST     RO5W01,XR2
    162E 0D 01 5673 560F         1087        CLC    RO5W01,X02FF          .AT END OF FSQ 3?
    1634 C0 04 1604              1088        BNH    RO5K0E                 IF NOT. GO SENSE AGAIN.
                                 1089
    1638 38 20 020A              1090        TBN    SBYTE2,SSW12          .SSW 12 ON? IF YES. PRINT ALL
    163C F2 90 05                1091        JF     RO5K10                 SENSED DATA FOR FSQ 3.
    163F C0 87 5567              1092        B      RO5DCS                .DUMP 256 WORDS FROM FSQ 3
    1643 20                 1643 1093        DC     XL1'20'
                                 1094
                                 1095
    1644 C2 01 5701              1096 RO5K10 LA     RO5W1B,XR1            .USE XR1 AS CS SNS DATA POINTER
    1648 C0 87 16CA              1097        B      RO5SPC                .SET UP COUNTERS FOR FSQ 4
    164C 10                 164C 1098        DC     XL1'10'
                                 1099
    164D 30 58 5FE6              1100 RO5K11 SNS    STATAC,CTSTOR         SENSE CS. STORE IN SNS DATA
    1651 4C 01 01 5FE6           1101        MVC    1(2,XR1),STATAC        TABLE. & COMPARE TO EXPECTED
    1656 D2 01 02                1102        LA     2(,XR1),XR1            DATA.
                                 1103
    1659 C1 5D 138C              1104        TIO    RO5SEX,ATTCHK         .GO PRINT IF ATT. CHK.
    165D 0D 01 5FE6 1698         1105        CLC    STATAC,RO5SSC(2)      .COMPARE TO EXPECTED DATA?
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ERR LOC OBJECT CODE        ADDR STNT SOURCE STATEMENT

    1663 F2 81 04                1106        JE     RO5K12                .IF YES. CONTINUE.IF NOT. ERROR.
    1666 C0 87 138C              1107        B      RO5SEX                .ERROR. GO PRINT
                                 1108
    166A 0E 01 1698 5671         1109 RO5K12 ALC    RO5SSC,RO5SIN(2)      .INCREMENT EXPECTED DATA
    1670 E2 02 01                1110        LA     1(,XR2),XR2
    1673 34 02 5673              1111        ST     RO5W01,XR2
    1677 0D 01 5673 56E1         1112        CLC    RO5W01,X03FF          .AT END OF FSQ 4?
    167D C0 04 164D              1113        BNH    RO5K11                 IF NOT. GO SENSE AGAIN.
                                 1114
    1681 38 20 020A              1115        TBN    SBYTE2,SSW12          .SSW 12 ON? IF YES. PRINT ALL
    1685 F2 90 05                1116        JF     RO5JC1                 SENSED DATA FOR FSQ 4.
    1688 C0 87 5567              1117        B      RO5DCS                .DUMP 256 WORDS FROM FSQ 4
    168C 10                 168C 1118        DC     XL1'10'
    168D C0 87 169D              1119 RO5JC1 B      RO5K14
                                 1120
    1691 C0 87 50A5              1121 RO5LPR B      STATUS                .ATTACH CHK DURING LIO
    1695 60                 1695 1122        DC     XL1'60'               .PRINT C.S. ADDR. EXP DATA
    1696 17                 1696 1123        DC     XL1'17'               .ERROR HALT  -17-
    1697 0000               1698 1124 RO5SSC DC     XL2'0'                .EXPECTED DATA
    1699 C0 87 16C3              1125        B      RO5K18
                                 1126
    169D 3D 80 566F              1127 RO5K14 CLI    RO5SF1,X'80'          .PART 1 JUST COMPLETED?
    16A1 F2 01 08                1128        JNE    RO5K15                 IF NOT. CONTINUE.
    16A4 3C 40 566F              1129        MVI    RO5SF1,X'40'           IF YES. SET UP FOR PART 2.
    16A8 C0 87 133A              1130        B      RO5K01
                                 1131
    16AC 3D 40 566F              1132 RO5K15 CLI    RO5SF1,X'40'          .PART 2 JUST COMPLETED?
    16B0 F2 01 10                1133        JNE    RO5K18                 IF NO. JUMP. END OF PART 3.
    16B3 3C 20 566F              1134        MVI    RO5SF1,X'20'           IF YES, SET UP FOR PART 3.
    16B7 C0 87 133A              1135        B      RO5K01
                                 1136
    16BB C0 87 50A5              1137 R5INCE B      STATUS                .NIAR INCREMENT ERROR
    16BF 04                 16BF 1138        DC     XL1'04'
    16C0 1A                 16C0 1139        DC     XL1'1A'               .ERROR HALT  -1A-
    16C1 0000               16C2 1140 RO5INC DC     XL2'0'                .EXPECTED DATA
                                 1141
    16C3 F3 58 80                1142 RO5K18 SIO    X'80',SIOI            DISABLE ATTACHMENT
    16C6 C0 87 0216              1143        B      LINK                  LINK TO NEXT ROUTINE
                                 1144
                                 1145 *********************
                                 1146 * SUBROUTINE RO5SPC ******************************************************
                                 1147 *********************                                                     *
                                 1148 * PURPOSE OF SUBROUTINE: TO SET PROGRAM COUNTERS FOR FSQ'S IN TEST       *
                                 1149 *                                                                        *
                                 1150 * LINKAGE:     B      RO5SPC                                             *
                                 1151 *              DC     XL1'XX'              .FLAG BYTE                    *
                                 1152 *                                                                        *
                                 1153 *                     BIT 0  -  FSQ 1 COUNT INITIALIZATION               *
                                 1154 *                     BIT 1  -  FSQ 2 COUNT INITIALIZATION               *
                                 1155 *                     BIT 2  -  FSQ 3 COUNT INITIALIZATION               *
                                 1156 *                     BIT 3  -  FSQ 4 COUNT INITIALIZATION               *
                                 1157 *                     BIT 4-7   NOT USED                                 *
                                 1158 *                                                                        *
                                 1159 * INPUT REQUIREMENT: RO5SF1 (SUBROUTINE FLAG) MUST BE PREVIOUSLY SET     *
                                 1160 *        TO THE TEST BEING EXECUTED:                                     *
                                 1161 *                                                                        *
                                 1162 *                     BIT 0  -  PART 1: FSQ1=FSQ2=FSQ3=FSQ4= -0000-      *
                                 1163 *                     BIT 1  -  PART 2: FSQ1=FSQ2=FSQ3=FSQ4= -FFFF-      *
                                 1164 *                     BIT 2  -  PART 3: FSQ1=0100-01FF,FSQ2=0200-02FF    *
                                 1165 *                                       FSQ3=0400-04FF,FSQ4=0800-08FF    *
                                 1166 *                     BIT 3  -  PART 4: FSQ1=0001-FF01,FSQ2=0002-FF02    *
                                 1167 *                                       FSQ3=0004-FF04,FSQ4=0008-FF08    *
                                 1168 *                     BIT 4-7   NOT USED                                 *
                                 1169 *                                                                        *
                                 1170 * OUTPUT: RO5SSC WILL CONTAIN THE STARTING COUNT FOR FSQ                 *
                                 1171 *         RO5SIN WILL CONTAIN THE COUNT INCREMENTING FACTOR              *
                                 1172 *                                                                        *
                                 1173 **************************************************************************
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1174
                              1174
 16CA 34 08 1739              1175 R05SPC ST    R05SR0+3,ARR        .STORE XR1, XR2, PSR, ARR & GET
 16CE 34 01 1731              1176        ST    R05SX1+3,XR1         THE FLAG BYTE.
 16D2 34 02 1735              1177        ST    R05SX2+3,XR2
 16D6 34 04 1738              1178        ST    R05SPS,PSR
 16DA 35 04 56E7              1179        L     R05ZER,PSR          .CLEAR PSR
 16DE 35 01 1739              1180        L     R05SR0+3,XR1
 16E2 02 01 01                1181        LA    1(,XR1),XR1         .INCREMENT TO RETURN ADDRESS
 16E5 34 01 1739              1182        ST    R05SR0+3,XR1        .STORE RETURN ADDRESS
                              1183
 16E9 38 80 566F              1184        TBN   R05SF1,X'80'        .PART 1?
 16ED F2 90 10                1185        JF    R05SK1               IF NOT, CONTINUE.
 16F0 0C 01 1698 56E7         1186        MVC   R05SSC,R05ZER(2)    .MOVE IN -0000- FOR FILL AND
 16F6 0C 01 5671 56E7         1187        MVC   R05SIN,R05ZER(2)     -0000- FOR INCREMENTING.
 16FC C0 87 172A              1188        B     R05SRR
                              1189
 1700 38 40 566F              1190 R05SK1 TBN   R05SF1,X'40'        .PART 2?
 1704 F2 90 10                1191        JF    R05SK5               IF NOT, CONTINUE.
 1707 0C 01 1698 0D69         1192        MVC   R05SSC,XFFFF(2)     .MOVE IN -FFFF- FOR FILL AND
 170D 0C 01 5671 56E7         1193        MVC   R05SIN,R05ZER(2)     -0000- FOR INCREMENTING.
 1713 C0 87 172A              1194        B     R05SRR
                              1195
 1717 38 20 566F              1196 R05SK5 TBN   R05SF1,X'20'        .PART 3?
 171B F2 90 0C                1197        JF    R05SRR               IF NOT, CONTINUE.
 171E 0C 01 5671 5668         1198        MVC   R05SIN,R05ONE(2)    .MOVE IN -0001- FOR INCREMENTING
 1724 0C 01 1698 56E7         1199        MVC   R05SSC,R05ZER(2)    .MOVE IN -0000- FOR FSQ 1 & GO
 172A 35 04 173B              1200 R05SRR L     R05SPS,PSR          .RESTORE XR1, XR2, & PSR
 172E C2 01 0000              1201 R05SX1 LA    *-*,XR1
 1732 C2 02 0000              1202 R05SX2 LA    *-*,XR2
 1736 C0 87 0000              1203 R05SRB B     *-*                 .RETURN TO ROUTINE
 173A 0000           173B     1204 R05SPS DC    XL2'0'
                              1205 ********************************************************************
                              1206 ********************************************************************
                              1207 *          ROUTINE 8 - CONTROL STORE AND MEMORY ENANCHING TEST     *
                              1208 ********************************************************************
                              1209 *                                                                  *
                              1210 *          THE ROUTINE TESTS MICROCONTROLLER INSTRUCTION BRANCH    *
                              1211 *          ON SERVICE REQUEST FOR THE FOLLOWING SERVICE REQUESTS:  *
                              1212 *          UNCONDITIONAL BRANCH, AND KATAKANA BRANCH               *
                              1213 *                                                                  *
                              1214 ********************************************************************
                              1215
 173C 08             173C     1216 RT08   DC    XL1'08'             ROUTINE -08-.
 173D 00             173D     1217        DC    XL1'00'
 173E 193C           173F     1218        DC    AL2(RT09)               NEXT ROUTINE
                              1219
 1740 C0 87 021A              1220        B     PRINT               ROUTINE HEADING PRINT
 1744 01             1744     1221        DC    XL1'01'
 1745 23             1745     1222        DC    IL1'35'
 1746 18A8           1747     1223        DC    AL2(RT6ST)
                              1224
                     184D     1225        USING R06ZER,XR1              .USE XR1 FOR INDEXING
 1748 C2 01 184D              1226        LA    R06ZER,XR1
 174C F3 58 80                1227        SIO   X'80',SIOI              .DISABLE ATTACHMENT
 174F F3 58 C0                1228        SIO   X'C0',SIOI              .ENABLE ATTACHMENT
 1752 0C 01 17F8 1860         1229        MVC   R06XD1,R06XB1(2)  <-----:ENTER EXPECTED DATA FOR 1 FSQ
 1758 0C 01 1870 1854         1230        MVC   R06BME,X5060(2)         .ENTER 80C 0.000 IN LOC 060
 175E 0C 01 186E 1856         1231        MVC   R06BMM,X50FF(2)         .ENTER 80C 0.0FF - FSQ1 MAX ADDR
 1764 0C 01 17F8 1862         1232        MVC   R06XD1,R06XB2(2)  <-----:ENTER EXPECTED DATA FOR 2 FSQS
 176A 0C 01 1870 5A4D         1233        MVC   R06BME,X5100(2)         .ENTER 80C 0.000 IN LOC 100
 1770 0C 01 186E 1858         1234        MVC   R06BMM,X51FF(2)         .ENTER 80C 0.1FF - FSQ1 MAX ADDR
 1776 0C 01 17F8 1864         1235        MVC   R06XD1,R06XB3(2)  <-----:ENTER EXPECTED DATA FOR 3 FSQS
 177C 0C 01 1870 185A         1236        MVC   R06BME,X5180(2)         .ENTER 80C 0.000 IN LOC 180
 1782 0C 01 186E 185C         1237        MVC   R06BMM,X52FF(2)         .ENTER 80C 0.2FF - FSQ1 MAX ADDR
 1788 F2 87 12                1238        J     R06K01                  .EXIT
 178B 0C 01 17F8 1866         1239        MVC   R06XD1,R06XB4(2)  <-----:ENTER EXPECTED DATA FOR 4 FSQS
 1791 0C 01 1870 5A40         1240        MVC   R06BME,X5200(2)         .ENTER 80C 0.000 IN LOC 200
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1797 0C 01 186E 188E         1241        MVC   R06BMM,XE3FF(2)         .ENTER 80C 0.3FF - FSQ1 MAX ADDR
                              1242
 179D 31 98 186E              1243 R06K01 LIO   R06BMM,CTSTOR           .LOAD CONTROL STORE
 17A1 0D 01 186E 1870         1244        CLC   R06BMM,R06BME(2)        .MID-POINT?
 17A7 F2 01 04                1245        JNE   R06K02                   IF NOT, CONTINUE.
 17AA 31 58 5A8A              1246        LIO   X5890,CTSTOR             IF YES, ENTER 80C  0,000.
 17AE 0F 01 186E 184E         1247 R06K02 SLC   R06BMM,R06ONE(2)        .DECREMENT ADDR FOR NEXT LOC
 17B4 0D 01 186E 5A0A         1248        CLC   R06BMM,X5000(2)         .ALL LOCATIONS LOADED?
 17BA C0 84 179D              1249        BH    R06K01                   IF NOT, GO LOAD NEXT WORD.
                              1250
 17BE F3 58 80                1251        SIO   X'80',SIOI              .DISABLE ATTACHMENT
 17C1 F3 58 E0                1252        SIO   X'E0',SIOI              .ENABLE MICROPROGRAM
 17C4 C1 5D 187D              1253        TIO   R06ACP,ATTCHK           .ERROR IF ATTACH CHECK
                              1254
 17C8 0C 01 1850 1882         1255 R06K06 MVC   R06W01,XF001            .INIT LOOP COUNTER TO 4096 LOOPS
 17CE C1 58 1871              1256 R06K03 TIO   R06E01,NOTRDY           .IF ATTCH NOT RDY = ERROR
 17D2 4D D9 00 184E           1257        CLC   R06ZER(218,XR1),R06ONE  |.600 MICRO SEC IDLE
 17D7 0E 01 1850 184E         1258        ALC   R06W01,R06ONE(2)        |.INCREMENT LOOP COUNTER
 17DD C0 20 17CE              1259        BNOL  R06K03                  |<TIMING LOOP. DO NOT ALTER.
                              1260
 17E1 F3 58 C0                1261 R06K07 SIO   X'C0',SIOI              .STOP MICRO CONTROLLER
 17E4 30 58 5FE6              1262        SNS   STATAC,CTSTOR           .DETERMINE LOC IN CONTROL STORE
 17E8 0D 01 5FE6 17F8         1263        CLC   STATAC,R06XD1(2)        .SENSED DATA = EXPECTED DATA?
 17EE F2 81 08                1264        JE    R06K05                   IF YES, CONTINUE.
 17F1 C0 87 5CA5              1265 R06PRT B     STATUS
 17F5 10                17F5  1266        DC    XL1'10'                 .PRINT ACT & EXP DATA
 17F6 1C                17F6  1267        DC    XL1'1C'                 .ERROR HALT -1C-
 17F7 0000              17F8  1268 R06XD1 DC    AL2(*-*)                .EXPECTED DATA ENTERED
                              1269
 17F9 C0 87 5918              1270 R06K05 B     LOADCS                  .GO LOAD MICRO CODE
 17FD 87                17FD  1271        DC    XL1'87'
 17FE 1867              17FF  1272        DC    AL2(R06MC1)
 1800 186C              1801  1273        DC    AL2(R06MC4)
 1802 0C 0F 18FC 19CC         1274        MVC   KATM(16),KATMM-4        .ADJUST MESSAGE FOR NO KATAKANA
 1808 3A 01 554D              1275        SBN   EMBP,X'01'              .SET ERROR HALT BYPASS ON
 180C 38 01 0A0C              1276        TBN   UDT2,X'01'              .TEST FOR KATAKANA INSTALLED
 1810 F2 10 0A                1277        JT    R06K08                  .JUMP IF SO
 1813 C0 87 54FE              1278        B     DOMICR                  .GO DO MICROPROGRAM
 1817 1E                1817  1279        DC    XL1'1E'                 .ERROR HALT  -1E-
 1818 8C03              1819  1280        DC    XL2'8C03'               .EXPECTED DATA
                              1281
 181A F2 87 0D                1282        J     R08END                  .GO CHECK FOR ERROR
 181D 0C 0F 18FC 19A0         1283 R06K08 MVC   KATM(16),KATMM          .ADJUST MESSAGE FOR KATAKANA
 1823 C0 87 54FE              1284        B     DOMICR                  .GO DO MICROPROGRAM
 1827 1F                1827  1285        DC    XL1'1F'                 .ERROR HALT  -1F-
 1828 8003              1829  1286        DC    XL2'8003'               .EXPECTED RESULT
                              1287
 182A 0D 01 5FE6 5550         1288 R08END CLC   STATAC(2),STATE1        .WAS THERE AN ERROR
 1830 C0 81 0216              1289        BE    LINK                    .EXIT IF NOT
 1834 C0 87 021A              1290        B     PRINT                   .PRINT KATAKANA BRANCH MESSAGE
 1838 81                1838  1291        DC    XL1'81'
 1839 51                1839  1292        DC    IL1'81'
 183A 18FC              183B  1293        DC    AL2(KATM)
 183C C0 87 021A              1294        B     PRINT
 1840 82                1840  1295        DC    XL1'82'
 1841 2B                1841  1296        DC    IL1'43'
 1842 193B              1843  1297        DC    AL2(KATMA)
 1844 C0 87 5FBF              1298        B     GOBLPO                  GO DO ERROR LOG & STOP
                              1299
 1848 C0 87 0216              1300        B     LINK                    .GO TO NEXT ROUTINE
                              1301
                              1301
                              1301
 184C 0000              184D  1302 R06ZER DC    XL2'0'
 184E 01                184E  1303 R06ONE DC    XL1'01'
 184F 0000              1850  1304 R06W01 DC    XL2'0'                  :
 1851 F001              1852  1305 XF001  DC    XL2'F001'
 1853 5080              1854  1306 X5080  DC    XL2'5080'
```

8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1855 50FF             1856 1307 X50FF   DC    XL2'50FF'
   1857 51FF             1858 1308 X51FF   DC    XL2'51FF'
   1859 5180             185A 1309 X5180   DC    XL2'5180'
   185B 52FF             185C 1310 X52FF   DC    XL2'52FF'
   185D 53FF             185E 1311 X53FF   DC    XL2'53FF'
   185F 50DC             1860 1312 R06XB1  DC    XL2'50DC'    <---------- EXPECTED DATA FOR 1 FSQ
   1861 51DC             1862 1313 R06XB2  DC    XL2'51DC'    <---------- EXPECTED DATA FOR 2 FSQS
   1863 52DC             1864 1314 R06XB3  DC    XL2'52DC'    <---------- EXPECTED DATA FOR 3 FSQS
   1865 52DC             1866 1315 R06XB4  DC    XL2'52DC'    <---------- EXPECTED DATA FOR 4 FSQS
                              1316
                              1316
                         1867 1317 R06MC1  EQU   *
   1867 5C03             1868 1318         DC    XL2'5C03'          .BOS 3,003
   1869 5000             186A 1319 R06MC2  DC    XL2'5000'          .BOS 0,000
   186B 5003             186C 1320 R06MC4  DC    XL2'5003'          .BOS 0,003
   186D 0000             186E 1321 R06BMM  DC    XL2'0'
   186F 0000             1870 1322 R06BME  DC    XL2'0'
                              1323
                         1871 1324 R06E01  EQU   *
   1871 C0 87 5B72            1325 R06NR   B     PRINTM             .ADAPTER NOT READY
   1875 20                1875 1326         DC    XL1'20'            .ERROR HALT  -20-
   1876 11                1876 1327         DC    IL1'17'
   1877 60B3              1878 1328         DC    AL2(STATM8)
   1879 C0 87 17E1            1329         B     R06K07             .RETURN TO ROUTINE
                              1330
   187D C0 87 5B72            1331 R06ACP  B     PRINTM             .ADAPTER CHECK
   1881 21                1881 1332         DC    XL1'21'            .ERROR HALT  -21-
   1882 10                1882 1333         DC    IL1'16'
   1883 6047              1884 1334         DC    AL2(STATM5)
   1885 C0 87 17C8            1335         B     R06K06             .RETURN TO ROUTINE
                              1336
   1889 D9D6E4E340F84CD4  18AB 1337 RT6ST   DC    CL35'ROUT.8 MICROCONTROLLER ENABLE & BOS'
   1891 C9C3D9D6C3D6D5E3      1337
   1899 D9D6D3D3C5D94CC5      1337
   18A1 D5C1C2D3C5405C40      1337
   18A9 C2D6E2                1337
   18AC C3C8C5C7D240E3C8  18DF 1338         DC    CL52'CHECK THE FOLLOWING - UCT SAYS KATAKANA (FEAT. CODE '
   18B4 C540C6D6D3D3D6E6      1338
   18BC C9D5C7406040E4C4      1338
   18C4 E340E2C1E8E24CD2      1338
   18CC C1E3C1D2C1D5C340      1338
   18D4 4DC6C5C1E3484CC3      1338
   18DC D6C4C540              1338
   18E0 F2F7F0F75D40E2C8  18FC 1339 KATN    DC    CL29'2707) SHOULD                '
   18E8 D6E4D3C4404040C40     1339
   18F0 4040404040404C40      1339
   18F8 4040404040            1339
   18FD D5D6E340C2C54CC9  1910 1340 KATNN   DC    CL20'NOT BE INSTALLED    '
   1905 D5E2E3C1D3D3C4C4      1340
   190D 40404040              1340
   1911 4040C5C9E3C8C5D9  1938 1341 KATNA   DC    CL43'  EITHER UDT OR FEATURE TIE UP MAY BE WRONG'
   1919 40E4C4E340D6D5A0      1341
   1921 C6C5C1E3E4D9C740      1341
   1929 E3C9C540E4D74CD4      1341
   1931 C1E840C2C540E4D9      1341
   1939 D6D5C7                1341
                              1342
                              1343 ********************************************************************
                              1344 *      ROUTINE 09 - SL MICRO OP TEST                               *
                              1345 ********************************************************************
                              1346 *                                                                  *
                              1347 *          THIS ROUTINE CHECKS THE SL MICRO OP. THE OPERANDS        *
                              1348 *          SHIFTED ARE 00, FF, AA AND 55.                          *
                              1349 *                                                                  *
                              1350 ********************************************************************
                              1351
   193C 09                193C 1352 RT09    DC    XL1'09'            ROUTINE NUMBER
   193D 00                193D 1353         DC    XL1'00'            NO MANUAL INTERVENTION
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   193E 19AA             193F 1354         DC    AL2(RT0A)          ADDRESS OF NEXT ROUTINE
                              1355
                         1951 1356         USING R07K01,XR1
   1940 C2 01 1951            1357         LA    R07K01,XR1         INITIALIZE XR1 FOR INDEXING
                              1358
   1944 1C 05 5A38 4E         1359         WVC   WICOP,RT07OP(6,XR1)  MOVE OP BEING TESTED TO
   1949 C0 87 021A            1360         B     PRINT              PRINT ROUTINE HEADING
   194D 01                194D 1361         DC    XL1'01'
   194E 19                194E 1362         DC    IL1'25'
   194F 5AA6              1950 1363         DC    AL2(WICPRT)
                              1364
   1951 C0 87 5916        1955 1365 R07K01  B     LOADCS             .GO LOAD MICROPROGRAM
   1955 87                1955 1366         DC    XL1'87'            .DISABLE UPON ENTRY, FILL 2ND
                              1367 *                                  & 3RD 256 BOS WITH BOS,0 - ADDR
   1956 19A0              1957 1368         DC    AL2(R07MCS)        .START OF MICRO CODE
   1958 19A9              1959 1369         DC    AL2(R07MCE)        .END OF MICROCODE
                              1370
   195A F3 58 80              1371         SIO   X'80',SIDI         .DISABLE ATTACHMENT
   195D 71 48 30              1372         LIO   EOOFF(,XR1),MDB0   .INITIALIZE MDB 0-1 = 00FF
   1960 31 49 0D56            1373         LIO   XAA55,MDB1         .INITIALIZE MDB 2-3 = AA55
   1964 C0 87 54FE            1374         B     DOMICR             .BRANCH TO EXECUTE MICROPROGRAM
   1968 25                1968 1375         DC    XL1'25'            .ERROR HALT  -25-
   1969 5004              196A 1376         DC    XL2'5004'          .EXPECTED DATA
                              1377
   1968 F3 58 80              1378         SIO   X'80',SIDI         .DISABLE ATTACHMENT
   196E 30 48 5FE6            1379         SNS   STATAC,MDB0        .SENSE MDB 0-1
   1972 1D 01 5FE6 30         1380         CLC   STATAC,EOOFF(2,XR1)  .COMPARE = TO 00FF
   1977 F2 81 08              1381         JE    R07T01             .JUMP IF SO
                         197A 1382 R07K03  EQU   *
   197A C0 87 5DA5            1383         B     STATUS             .ERROR, GO TO STATUS ROUTINE
   197E 20                197E 1384         DC    XL1'20'            .PRINT ACTUAL, EXP. DATA
   197F 26                197F 1385         DC    XL1'26'            .ERROR HALT  -26-
   1980 00FF              1981 1386 EOOFF   DC    XL2'00FF'          .EXPECTED DATA
                              1387
   1982 30 49 5FE6            1388 R07T01  SNS   STATAC,MDB1         .SENSE MDB 2-3
   1986 1D 01 5FE6 44         1389         CLC   STATAC,E55AA(2,XR1)  .COMPARE = TO 55AA
   198B F2 81 0E              1390         JE    R07T02
                              1391
   198E C0 87 5DA5            1392         B     STATUS             .ERROR, GO TO STATUS ROUTINE
   1992 20                1992 1393         DC    XL1'20'            .PRINT ACTUAL, EXP. DATA
   1993 27                1993 1394         DC    XL1'27'            .ERROR HALT  -27-
   1994 55AA              1995 1395 E55AA   DC    XL2'55AA'          .EXPECTED DATA
                              1396
   1996 C0 87 0216            1397 R07T02  B     LINK               .GO TO NEXT ROUTINE
                              1398
   199A F0F94040E2D3      199F 1399 RT07OP  DC    CL6'09  SL'
                              1400
                         19A0 1401 R07MCS  EQU   *
   19A0 1040              19A1 1402         DC    XL2'1040'    00  SL MDB0
   19A2 1140              19A3 1403         DC    XL2'1140'    01  SL MDB1
   19A4 1240              19A5 1404         DC    XL2'1240'    02  SL MDB2
   19A6 1340              19A7 1405         DC    XL2'1340'    03  SL MDB3
   19A8 5004              19A9 1406 R07MCE  DC    XL2'5004'    04  BOS,0 HANG AT ADDR 4
                              1407
                              1408 ********************************************************************
                              1409 *      ROUTINE 0A - BOC MICRO INSTRUCTION                          *
                              1410 ********************************************************************
                              1411 *                                                                  *
                              1412 *      THIS ROUTINE TESTS BOC,3 (ALL BITS = 0), BOC,2 (LOW 4 BITS = 0)*
                              1413 *      BOC,1 (HI 4 BITS =0) AND BOC,0 (ALL BITS NOT ZERO).  THE TEST  *
                              1414 *      IS DONE BY SHIFTING ONE BIT THROUGHOUT THE BYTE AND BY SHIFTING*
                              1415 *      ZERO BITS IN A BYTE.                                        *
                              1416 *                                                                  *
                              1417 ********************************************************************
                              1418
   19AA 0A                19AA 1419 RT0A    DC    XL1'0A'            ROUTINE NUMBER
   19AB 00                19AB 1420         DC    XL1'00'            NO MANUAL INTERVENTION
   19AC 1A68              19AD 1421         DC    AL2(RT0B)          ADDRESS OF NEXT ROUTINE
```

8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1422
                    198F 1423          USING R08K01,XR1
  19AE C2 01 198F        1424          LA    R08K01,XR1                 INITIALIZE XR1 FOR INDEXING
                         1425
  1982 1C 05 5A38 1F     1426          MVC   MICOP,RT08OP(6,XR1)        MOVE OP BEING TESTED TO
  1987 C0 87 021A        1427          B     PRINT                      PRINT ROUTINE HEADING
  1988 01                1428          DC    XL1'01'
  198C 19                1429          DC    XL1'25'
  198D 5A46              198E 1430     DC    AL2(MICPRT)
                         1431
  198F C0 87 5918        1432 R08K01 B       LOADCS                     .GO LOAD MICROPROGRAM
  19C3 83                19C3 1433     DC    XL1'83'                    .DISABLE UPON ENTRY, FILL 2ND
                         1434 *                                         FSQ WITH BCS,0 ON ADDRESS
  19C4 19E1              19C5 1435     DC    AL2(R08MCS)                .START OF MICRO CODE
  19C6 1A6A              19C7 1436     DC    AL2(R08MCE)                .END OF MICROCODE
                         1437
  19C8 F3 58 80          1438          SIO   X'80',SIOI                 .DISABLE ATTACHMENT
  19CB 71 48 21          1439          LIO   X0080(,XR1),HDB0           .LOAD HDB0-1 = 0080
                         1440
  19CE C0 87 54FE        1441          B     DONICR                     .GO EXECUTE MICROPROGRAM
  19D2 2A                19D2 1442     DC    XL1'2A'                    .ERROR HALT  -2A-
  19D3 5044              19D4 1443     DC    XL2'5044'                  .EXPECTED RESULT
                         1444
  19D5 C0 87 0216        1445          B     LINK                       .GO TO NEXT ROUTINE
                         1446
  19D9 F0C140C2D6C3      19DE 1447 RT08OP DC   CL6'0A BOC'
                         1448
  19DF 0080              19E0 1449 X0080  DC   XL2'0080'                  .CONSTANT 0080
                         1450 *-------------------------------*
                         1451 * START OF MICROPROGRAM LISTING *
                         1452 *-------------------------------*
                         19E1 1453 R08MCS EQU  *
  19E1 1040              19E2 1454     DC    XL2'1040'   00  SL HDB0 TO SET COND 3
  19E3 9C03              19E4 1455     DC    XL2'9C03'   01  BOC,3 MUST BRANCH
  19E5 5002              19E6 1456     DC    XL2'5002'   02  ERROR, HANG
  19E7 90E1              19E8 1457     DC    XL2'90E1'   03  BOC,0 MUST NOT BRANCH
  19E9 1140              19EA 1458     DC    XL2'1140'   04  SHIFT HDB 1 = 01
  19EB 9D00              19EC 1459     DC    XL2'9D00'   05  BOC,3 MUST NOT BRANCH
  19ED 9901              19EE 1460     DC    XL2'9901'   06  BOC,2 MUST NOT BRANCH
  19EF 9409              19F0 1461     DC    XL2'9409'   07  BOC,1 MUST BRANCH
  19F1 5008              19F2 1462     DC    XL2'5008'   08  ERROR, HANG
  19F3 900B              19F4 1463     DC    XL2'900B'   09  BOC,0 MUST BRANCH
  19F5 500A              19F6 1464     DC    XL2'500A'   0A  ERROR, HANG
  19F7 1140              19F8 1465     DC    XL2'1140'   0B  SHIFT HDB 1 = 02
  19F9 9D02              19FA 1466     DC    XL2'9D02'   0C  BOC,3 MUST NOT BRANCH
  19FB 9903              19FC 1467     DC    XL2'9903'   0D  BOC,2 MUST NOT BRANCH
  19FD 9410              19FE 1468     DC    XL2'9410'   0E  BOC,1 MUST BRANCH
  19FF 500F              1A00 1469     DC    XL2'500F'   0F  ERROR, HANG
  1A01 9012              1A02 1470     DC    XL2'9012'   10  BOC,0 MUST BRANCH
  1A03 5011              1A04 1471     DC    XL2'5011'   11  ERROR, HANG
  1A05 1140              1A06 1472     DC    XL2'1140'   12  SHIFT HDB 1 = 04
  1A07 9D04              1A08 1473     DC    XL2'9D04'   13  BOC,3 MUST NOT BRANCH
  1A09 9905              1A0A 1474     DC    XL2'9905'   14  BOC,2 MUST NOT BRANCH
  1A0B 9417              1A0C 1475     DC    XL2'9417'   15  BOC,1 MUST BRANCH
  1A0D 5016              1A0E 1476     DC    XL2'5016'   16  ERROR, HANG
  1A0F 9019              1A10 1477     DC    XL2'9019'   17  BOC,0 MUST BRANCH
  1A11 5018              1A12 1478     DC    XL2'5018'   18  ERROR, HANG
  1A13 1140              1A14 1479     DC    XL2'1140'   19  SHIFT HDB 1 = 08
  1A15 9D06              1A16 1480     DC    XL2'9D06'   1A  BOC,3 MUST NOT BRANCH
  1A17 9907              1A18 1481     DC    XL2'9907'   1B  BOC,2 MUST NOT BRANCH
  1A19 941E              1A1A 1482     DC    XL2'941E'   1C  BOC,1 MUST BRANCH
  1A1B 501D              1A1C 1483     DC    XL2'501D'   1D  ERROR, HANG
  1A1D 9020              1A1E 1484     DC    XL2'9020'   1E  BOC,0 MUST BRANCH
  1A1F 501F              1A20 1485     DC    XL2'501F'   1F  ERROR, HANG
  1A21 1140              1A22 1486     DC    XL2'1140'   20  SHIFT HDB 1 = 10
  1A23 9D08              1A24 1487     DC    XL2'9D08'   21  BOC,3 MUST NOT BRANCH
  1A25 9509              1A26 1488     DC    XL2'9509'   22  BOC,1 MUST NOT BRANCH
  1A27 9825              1A28 1489     DC    XL2'9825'   23  BOC,2 MUST BRANCH
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  1A29 5024              1A2A 1490     DC    XL2'5024'   24  ERROR, HANG
  1A2B 9027              1A2C 1491     DC    XL2'9027'   25  BOC,0 MUST BRANCH
  1A2D 5026              1A2E 1492     DC    XL2'5026'   26  ERROR, HANG
  1A2F 1140              1A30 1493     DC    XL2'1140'   27  SHIFT HDB 1 = 20
  1A31 9D0A              1A32 1494     DC    XL2'9D0A'   28  BOC,3 MUST NOT BRANCH
  1A33 9508              1A34 1495     DC    XL2'9508'   29  BOC,1 MUST NOT BRANCH
  1A35 982C              1A36 1496     DC    XL2'982C'   2A  BOC,2 MUST BRANCH
  1A37 5028              1A38 1497     DC    XL2'5028'   2B  ERROR, HANG
  1A39 982E              1A3A 1498     DC    XL2'902E'   2C  BOC,0 MUST BRANCH
  1A3B 502D              1A3C 1499     DC    XL2'502D'   2D  ERROR, HANG
  1A3D 1140              1A3E 1500     DC    XL2'1140'   2E  SHIFT HDB 1 = 40
  1A3F 9D0C              1A40 1501     DC    XL2'9D0C'   2F  BOC,3 MUST NOT BRANCH
  1A41 950D              1A42 1502     DC    XL2'950D'   30  BOC,1 MUST NOT BRANCH
  1A43 9833              1A44 1503     DC    XL2'9833'   31  BOC,2 MUST BRANCH
  1A45 5032              1A46 1504     DC    XL2'5032'   32  ERROR, HANG
  1A47 9035              1A48 1505     DC    XL2'9035'   33  BOC,0 MUST BRANCH
  1A49 5034              1A4A 1506     DC    XL2'5034'   34  ERROR, HANG
  1A4B 1140              1A4C 1507     DC    XL2'1140'   35  SHIFT HDB 1 = 80
  1A4D 9D0E              1A4E 1508     DC    XL2'9D0E'   36  BOC,3 MUST NOT BRANCH
  1A4F 950F              1A50 1509     DC    XL2'950F'   37  BOC,1 MUST NOT BRANCH
  1A51 983A              1A52 1510     DC    XL2'983A'   38  BOC,2 MUST BRANCH
  1A53 5039              1A54 1511     DC    XL2'5039'   39  ERROR, HANG
  1A55 903C              1A56 1512     DC    XL2'903C'   3A  BOC,0 MUST BRANCH
  1A57 503B              1A58 1513     DC    XL2'503B'   3B  ERROR, HANG
  1A59 1040              1A5A 1514     DC    XL2'1040'   3C  SHIFT HDB 0 TO SET ALL CONDITIONS
  1A5B 9C3F              1A5C 1515     DC    XL2'9C3F'   3D  BOC,3 MUST BRANCH
  1A5D 503E              1A5E 1516     DC    XL2'503E'   3E  ERROR, HANG
  1A5F 9841              1A60 1517     DC    XL2'9841'   3F  BOC,2 MUST BRANCH
  1A61 5040              1A62 1518     DC    XL2'5040'   40  ERROR, HANG
  1A63 9443              1A64 1519     DC    XL2'9443'   41  BOC,1 MUST BRANCH
  1A65 5042              1A66 1520     DC    XL2'5042'   42  ERROR, HANG
  1A67 9110              1A68 1521     DC    XL2'9110'   43  BOC,0 MUST NOT BRANCH
  1A69 5044              1A6A 1522 R08MCE DC   XL2'5044'   44  HANG, TEST RAN OKAY
                         1523
                         1523
                         1524 ************************************************************
                         1525 *      ROUTINE 0B - SBN MICRO INSTRUCTION                  *
                         1526 ************************************************************
                         1527 *                                                          *
                         1528 *      THIS ROUTINE TEST THE SBN MICRO INSTRUCTION         *
                         1529 *                                                          *
                         1530 ************************************************************
                         1531
  1A6B 0B                1A6B 1532 RT0B   DC   XL1'0B'                    ROUTINE NUMBER
  1A6C 00                1A6C 1533     DC    XL1'00'                    NO MANUAL INTERVENTION
  1A6D 1AF6              1A6E 1534     DC    AL2(RT0C)                  ADDRESS OF NEXT ROUTINE
                         1535
                         1A80 1536     USING R09K01,XR1
  1A6F C2 01 1A80        1537          LA    R09K01,XR1                 INITIALIZE XR1 FOR INDEXING
                         1538
  1A73 1C 05 5A38 67     1539          MVC   MICOP,RT09OP(6,XR1)        MOVE OP BEING TESTED TO
  1A78 C0 87 021A        1540          B     PRINT                      PRINT ROUTINE HEADING
  1A7C 01                1A7C 1541     DC    XL1'01'
  1A7D 19                1A7D 1542     DC    XL1'25'
  1A7E 5A46              1A7F 1543     DC    AL2(MICPRT)
                         1544
  1A80 C0 87 5918        1545 R09K01 B       LOADCS                     .GO LOAD MICROPROGRAM
  1A84 83                1A84 1546     DC    XL1'83'                    .DISABLE UPON ENTRY, FILL 2ND
                         1547 *                                         FSQ WITH BCS,0 ON ADDRESS
  1A85 1AE8              1A86 1548     DC    AL2(R09MCS)                .START OF MICRO CODE
  1A87 1AF5              1A88 1549     DC    AL2(R09MCE)                .END OF MICROCODE
                         1550
  1A89 F3 58 80          1551          SIO   X'80',SIOI                 .DISABLE ATTACHMENT
  1A8C 31 48 0D62        1552          LIO   ZERO,HDB0                  .SET HDB 0-1 = 0000
  1A90 31 49 0D57        1553          LIO   X55AA,HDB1                 .SET HDB 2-3 = 55AA
  1A94 31 4A 0D57        1554          LIO   X55AA,HDB2                 .SET HDB 4-5 = 55AA
                         1555
  1A98 C0 87 54FE        1556          B     DONICR                     .GO DO MICRO PROGRAM
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8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1A9C 2F               1A9C 1557          DC    XL1'2F'          .ERROR HALT -2F-
   1A9D 5006             1A9E 1558          DC    XL2'5006'        .EXPECTED DATA
                         1559
   1A9F F3 58 80         1560               SIO   X'80'.SIOI       .DISABLE ATTACHMENT
   1AA2 30 48 5FE6       1561               SNS   STATAC.HDB0      .SENSE HDB 0-1
   1AA6 1D 01 5FE6 35    1562               CLC   STATAC.R09EX1(2.XR1)  .CHECK FOR EXPECTED RESULT
   1AAB F2 81 08         1563               JE    R09B01           .GO ON IF OKAY
   1AAE C0 87 5DA5       1564               B     STATUS           .ERROR
   1AB2 20               1AB2 1565          DC    XL1'20'          .PRINT ACT. & EXPECTED DATA
   1AB3 30               1AB3 1566          DC    XL1'30'          .ERROR HALT -30-
   1AB4 55AA             1AB5 1567 R09EX1   DC    XL2'55AA'        .EXPECTED DATA
                         1568
                         1569 R09B01 SNS   STATAC.HDB1
   1AB6 30 49 5FE6       1570               CLC   STATAC.R09EX2(2.XR1)  .SENSE HDB 2-3
   1ABA 1D 01 5FE6 49    1571               JE    R09B02           .CHECK FOR EXPECTED RESULT
   1ABF F2 81 08         1572               B     STATUS           .GO ON IF OKAY
   1AC2 C0 87 5DA5       1AC6 1573          DC    XL1'20'          .ERROR
   1AC6 20               1AC7 1574          DC    XL1'31'          .PRINT ACT. & EXPECTED DATA
   1AC7 31               1AC9 1575 R09EX2   DC    XL2'FFFF'        .ERROR HALT -31-
   1AC9 FFFF             1576                                      .EXPECTED RESULT
                         1577 R09B02 SNS   STATAC.HDB2
   1ACA 30 4A 5FE6       1578               CLC   STATAC.R09EX3(2.XR1)  .SENSE HDB 4-5
   1ACE 1D 01 5FE6 5D    1579               JE    R09B03           .CHECK FOR EXPECTED RESULT
   1AD3 F2 81 08         1580               B     STATUS           .GO ON IF OKAY
   1AD6 C0 87 5DA5       1ADA 1581          DC    XL1'20'          .ERROR
   1ADA 20               1ADB 1582          DC    XL1'32'          .PRINT ACT. & EXPECTED RESULT
   1ADB 32               1ADD 1583 R09EX3   DC    XL2'F5AF'        .ERROR HALT -32-
   1ADD F5AF             1584                                      .EXPECTED DATA
                         1585 R09B03 B     LINK             .GO TO NEXT ROUTINE
   1ADE C0 87 0216       1586
   1AE2 F0C240E2C2D5     1AE7 1587 RT090P   DC    CL6'0B SEN'
                         1588
                         1589 *-------------------------------*
                         1590 * START OF MICROPROGRAM LISTING *
                         1591 *-------------------------------*
                         1AE8 1592 R09MCS EQU   *
   1AE8 6055             1AE9 1593          DC    XL2'6055'   00  SET HDB 0 = 55
   1AEA 61AA             1AEB 1594          DC    XL2'61AA'   01  SET HDB 1 = AA
   1AEC 62AA             1AED 1595          DC    XL2'62AA'   02  SET HDB 2 = FF
   1AEE 6355             1AEF 1596          DC    XL2'6355'   03  SET HDB 3 = FF
   1AF0 64F5             1AF1 1597          DC    XL2'64F5'   04  SET HDB 4 = F5
   1AF2 65AF             1AF3 1598          DC    XL2'65AF'   05  SET HDB 5 = AF
   1AF4 5006             1AF5 1599 R09MCE   DC    XL2'5006'   06  HANG. TEST COMPLETED
                         1600
                         1601 ********************************************************************
                         1602 *       ROUTINE 0C - SBF MICRO INSTRUCTION                         *
                         1603 ********************************************************************
                         1604 *                                                                  *
                         1605 *       THIS ROUTINE CHECK THE SBF MICRO INSTRUCTION               *
                         1606 *                                                                  *
                         1607 ********************************************************************
                         1608
   1AF6 0C               1AF6 1609 RT0C     DC    XL1'0C'          ROUTINE NUMBER
   1AF7 00               1AF7 1610          DC    XL1'00'          NO MANUAL INTERVENTION
   1AF8 1B65             1AF9 1611          DC    AL2(RT0D)        ADDRESS OF NEXT ROUTINE
                         1612
                         1B0B 1613          USING R0AK01.XR1
   1AFA C2 01 1B09       1614               LA    R0AK01.XR1       INITIALIZE XR1 FOR INDEXING
                         1615
   1AFE 1C 05 5A38 4F    1616               MVC   MICOP.RT0AOP(6.XR1)  MOVE OP BEING TESTED TO
   1B03 C0 87 021A       1617               B     PRINT            PRINT ROUTINE HEADING
   1B07 01               1B07 1618          DC    XL1'01'
   1B08 19               1B08 1619          DC    IL1'25'
   1B09 5A46             1B0A 1620          DC    AL2(MICPRT)
                         1621
   1B0B C0 87 5918       1622 R0AK01 B     LOADCS           .GO LOAD MICROPROGRAM
   1B0F 83               1B0F 1623          DC    XL1'83'          .DISABLE UPON ENTRY. FILL 2ND
                         1624 *                                    FSQ WITH BCS.0 ON ADDRESS
```


8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1810 1B59             1811 1625          DC    AL2(R0AMCS)      .START OF MICRO CODE
   1812 1B64             1813 1626          DC    AL2(R0AMCE)      .END OF MICROCODE
                         1627
   1814 F3 58 80         1628               SIO   X'80'.SIOI       .DISABLE ATTACHMENT
   1817 31 4A 0D59       1629               LIO   XFFFF.HDB2       .SET HDB 4-5 = FFFF
   181B 31 49 0D67       1630               LIO   X55AA.HDB1       .SET HDB 2-3 = 55AA
                         1631
   181F C0 87 54FE       1632               B     DONICR           .GO EXECUTE MICRO PROGRAM
   1823 36               1823 1633          DC    XL1'36'          .ERROR HALT -36-
   1824 5004             1825 1634          DC    XL2'5004'        .EXPECTED RESULT
                         1635
   1826 F3 58 80         1636               SIO   X'80'.SIOI       .DISABLE ATTACHMENT
   1829 30 4A 5FE6       1637               SNS   STATAC.HDB2       .SENSE HDB 4-5
   182D 1D 01 5FE6 31    1638               CLC   STATAC.R0AEX1(2.XR1)  .COMPARE AGAINST EXPECTED
   1832 F2 81 08         1639               JE    R0AB01           .CONTINUE IF OKAY
   1835 C0 87 5DA5       1640               B     STATUS           .ERROR
   1839 20               1B3B 1641          DC    XL1'20'          .PRINT EXP. & ACT. VALUES
   183A 37               1B3A 1642          DC    XL1'37'          .ERROR HALT -37-
   183B 55AA             183C 1643 R0AEX1   DC    XL2'55AA'        .EXPECTED RESULT
                         1644
   183D 30 49 5FE6       1645 R0AB01 SNS   STATAC.HDB1       .SENSE HDB 2-3
   1841 1D 01 5FE6 45    1646               CLC   STATAC.R0AEX2(2.XR1)  .COMPARE AGAINST EXPECTED
   1846 F2 81 08         1647               JE    R0AB02           .CONTINUE IF OKAY
   1849 C0 87 5DA5       1648               B     STATUS           .ERROR
   184D 20               184D 1649          DC    XL1'20'          .PRINT EXP. & ACT. RESULTS
   184E 38               184E 1650          DC    XL1'38'          .ERROR HALT -38-
   184F 0480             1850 1651 R0AEX2   DC    XL2'0480'        .EXPECTED RESULT
                         1652
   1851 C0 87 0216       1653 R0AB02 B     LINK             .GO TO NEXT ROUTINE
                         1654
   1855 F0C340E2C2C6     1B5A 1655 RT0A0P   DC    CL6'0C SBF'
                         1656
                         1657 *-------------------------------*
                         1658 * START OF MICROPROGRAM LISTING *
                         1659 *-------------------------------*
                         1B5B 1660 R0AMCS EQU   *
   1B5B C6AA             1B5C 1661          DC    XL2'C6AA'   00  SBF. HDB 4 = 55
   1B5D C555             1B5E 1662          DC    XL2'C555'   01  SBF. HDB 5 = AA
   1B5F C2FB             1B60 1663          DC    XL2'C2FB'   02  SBF. HDB 2 = 04
   1B61 C37F             1B62 1664          DC    XL2'C37F'   03  SBF. HDB 3 = 80
   1B63 5004             1B64 1665 R0AMCE   DC    XL2'5004'   04  HANG. PROGRAM COMPLETED
                         1666
                         1667 ********************************************************************
                         1668 *       ROUTINE 0D - IC MICRO INSTRUCTION                          *
                         1669 ********************************************************************
                         1670 *                                                                  *
                         1671 *       THIS ROUTINE TESTS THE IC MICRO INSTRUCTION                *
                         1672 *                                                                  *
                         1673 ********************************************************************
                         1674
   1865 0D               1865 1675 RT0D     DC    XL1'0D'          ROUTINE NUMBER
   1866 00               1866 1676          DC    XL1'00'          NO MANUAL INTERVENTION
   1867 1B04             1868 1677          DC    AL2(RT0E)        ADDRESS OF NEXT ROUTINE
                         1678
                         1B7A 1679          USING R0BK01.XR1
   1869 C2 01 187A       1680               LA    R0BK01.XR1       INITIALIZE XR1 FOR INDEXING
                         1681
   186D 1C 05 5A38 4F    1682               MVC   MICOP.RT0B0P(6.XR1)  MOVE OP BEING TESTED TO
   1872 C0 87 021A       1683               B     PRINT            PRINT ROUTINE HEADING
   1876 01               1876 1684          DC    XL1'01'
   1877 19               1877 1685          DC    IL1'25'
   1878 5A46             1879 1686          DC    AL2(MICPRT)
                         1687
   187A C0 87 5918       1688 R0BK01 B     LOADCS           .GO LOAD MICROPROGRAM
   187E 93               187E 1689          DC    XL1'83'          .DISABLE UPON ENTRY. FILL 2ND
                         1690 *                                    FSQ WITH BCS.0 ON ADDRESS
   187F 1BCA             1B80 1691          DC    AL2(R0BMCS)      .START OF MICRO CODE
   1881 1BD3             1B82 1692          DC    AL2(R0BMCE)      .END OF MICROCODE
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                               1693
    1883 F3 58 80              1694        SIO   X'80'.SIOI                  .DISABLE ATTACHMENT
    1886 31 48 0059            1695        LIO   XFFFF.HDB3                  .SET HDB 6-7 = FFFF
    188A 31 4C 560B            1696        LIO   X00FF.HDB4                  .SET HDB 8-9 = 00FF
                               1697
    188E C0 87 54FE            1698        B     DOMICR                      .GO EXECUTE MICROPROGRAM
    1892 3C               1892 1699        DC    XL1'3C'                     .ERROR HALT  -3C-
    1893 5004             1894 1700        DC    XL2'5004'                   .EXPECTED RESULT
                               1701
    1895 F3 58 80              1702        SIO   X'80'.SIOI                  .DISABLE ATTACHMENT
    1898 30 48 5FE6            1703        SNS   STATAC.HDB3                 .SENSE HDB 6-7
    189C 1D 01 5FE6 31         1704        CLC   STATAC.ROBEX1(2.XR1)        .COMPARE FOR EXPECTED
    18A1 F2 81 08              1705        JE    ROBB01                      .CONTINUE IF OKAY
    18A4 C0 87 50A5            1706        B     STATUS                      .ERROR
    18A8 20               18A8 1707        DC    XL1'20'                     .PRINT EXP. & ACT. DATA
    18A9 3E               18A9 1708        DC    XL1'3E'                     .ERROR HALT  -3E-
    18AA 55AA             18AB 1709 ROBEX1 DC    XL2'55AA'                   .EXPECTED RESULT
                               1710
    18AC 30 4C 5FE6            1711 ROBB01 SNS   STATAC.HDB4                 .SENSE HDB 8-9
    18B0 1D 01 5FE6 45         1712        CLC   STATAC.ROBEX2(2.XR1)        .COMPARE AGAINST EXPECTED
    18B5 F2 81 08              1713        JE    ROBB02                      .CONTINUE IF OKAY
    18B8 C0 87 50A5            1714        B     STATUS                      .ERROR
    18BC 20               18BC 1715        DC    XL1'20'                     .PRINT EXP. & ACT. VALUES
    18BD 3F               18BD 1716        DC    XL1'3F'                     .ERROR HALT  -3F-
    18BE FF00             18BF 1717 ROBEX2 DC    XL2'FF00'                   .EXPECTED RESULT
                               1718
    18C0 C0 87 0216            1719 ROBB02 B     LINK                        .GO TO NEXT ROUTINE
                               1720
    18C4 F0C44040C9C3     18C9 1721 RTOBOP DC    CL6'0D  IC'
                               1722
                               1723 *-------------------------------*
                               1724 * START OF MICROPROGRAM LISTING *
                               1725 *-------------------------------*
                          18CA 1726 ROBMCS EQU   *
    18CA 7655             18CB 1727        DC    XL2'7655'   00  IC SET HDB 6 = 55
    18CC 77AA             18CD 1728        DC    XL2'77AA'   01  IC SET HDB 7 = AA
    18CE 78FF             18CF 1729        DC    XL2'78FF'   02  IC SET HDB 8 = FF
    18D0 7900             18D1 1730        DC    XL2'7900'   03  IC SET HDB 9 = 00
    18D2 5004             18D3 1731 ROBMCE DC    XL2'5004'   04  HANG. PROGRAM COMPLETED
                               1732
                               1733 *****************************************************************
                               1734 *      ROUTINE OE - TEN MICRO INSTRUCTION                       *
                               1735 *****************************************************************
                               1736 *                                                               *
                               1737 *      THIS RCUTINE TEST THE TBN MICRO INSTRUCTION              *
                               1738 *                                                               *
                               1739 *****************************************************************
                               1740
    18D4 0E               18D4 1741 RTOE   DC    XL1'0E'                     ROUTINE NUMBER
    18D5 00               18D5 1742        DC    XL1'00'                     NO MANUAL INTERVENTION
    18D6 1C33             18D7 1743        DC    AL2(RTOF)                   ADDRESS OF NEXT ROUTINE
                               1744
                          18E9 1745        USING ROCK01.XR1
    18D8 C2 01 18E9            1746        LA    ROCK01.XR1                  INITIALIZE XR1 FOR INDEXIN
                               1747
    18DC 1C 05 5A38 19         1748        MVC   MICOP.RTOCOP(6.XR1)         MOVE OP BEING TESTED TO
    18E1 C0 87 021A            1749        B     PRINT                       PRINT ROUTINE HEADING
    18E5 01               18E5 1750        DC    XL1'01'
    18E6 19               18E6 1751        DC    IL1'25'
    18E7 5A46             18E8 1752        DC    AL2(MICPRT)
                               1753
    18E9 C0 87 5918            1754 ROCK01 B     LOADCS                      .GO LOAD MICROPROGRAM
    18ED 83               18ED 1755        DC    XL1'83'                     .DISABLE UPON ENTRY. FILL 2ND
                               1756 *                                         FSQ WITH BCS.0 ON ADDRESS
    18EE 1C03             18EF 1757        DC    AL2(ROCMCS)                 .START OF MICRO CODE
    18F0 1C32             18F1 1758        DC    AL2(ROCMCE)                 .END OF MICROCODE
                               1759
    18F2 C0 87 54FE            1760        B     DOMICR                      .GO EXECUTE MICROPROGRAM
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    18F6 42               18F6 1761        DC    XL1'42'                     .ERROR HALT  -42-
    18F7 5017             18F8 1762        DC    XL2'5017'                   .EXPECTED DATA
                               1763
    18F9 C0 87 0216            1764        B     LINK                        .GO TO NEXT ROUTINE
                               1765
    18FD F0C540E3C2D5     1C02 1766 RTOCOP DC    CL6'0E TBN'
                               1767
                               1768 *-------------------------------*
                               1769 * START OF MICROPROGRAM LISTING *
                               1770 *-------------------------------*
                          1C03 1771 ROCMCS EQU   *
    1C03 7A55             1C04 1772        DC    XL2'7A55'   00  IC SET HDB A = 55
    1C05 7BAA             1C06 1773        DC    XL2'7BAA'   01  IC SET HDB B = AA
    1C07 FAC3             1C08 1774        DC    XL2'FAC3'   02  TBN. RESETS ALL CONDITIONS
    1C09 9D00             1C0A 1775        DC    XL2'9D00'   03  BOC.3 MUST NOT BRANCH
    1C0B 9901             1C0C 1776        DC    XL2'9901'   04  BOC.2 MUST NOT BRANCH
    1C0D 9502             1C0E 1777        DC    XL2'9502'   05  BOC.1 MUST NOT BRANCH
    1C0F FA5C             1C10 1778        DC    XL2'FA5C'   06  TBN. SETS COND 1 ON. 2 AND 3 OFF
    1C11 9D03             1C12 1779        DC    XL2'9D03'   07  BOC.3 MUST NOT BRANCH
    1C13 9904             1C14 1780        DC    XL2'9904'   08  BOC.2 MUST NOT BRANCH
    1C15 940B             1C16 1781        DC    XL2'940B'   09  BOC.1 MUST BRANCH
    1C17 500A             1C18 1782        DC    XL2'500A'   0A  ERROR. HANG
    1C19 FB3A             1C1A 1783        DC    XL2'FB3A'   0B  TBN. SETS COND 2 ON. 1 AND 3 OFF
    1C1B 9D05             1C1C 1784        DC    XL2'9D05'   0C  BOC.3 MUST NOT BRANCH
    1C1D 9506             1C1E 1785        DC    XL2'9506'   0D  BOC.1 MUST NOT BRANCH
    1C1F 9810             1C20 1786        DC    XL2'9810'   0E  BOC.2 MUST BRANCH
    1C21 500F             1C22 1787        DC    XL2'500F'   0F  ERROR. HANG
    1C23 FB82             1C24 1788        DC    XL2'FB82'   10  TBN. SETS ALL CONDITIONS ON
    1C25 9C13             1C26 1789        DC    XL2'9C13'   11  BOC.3 MUST BRANCH
    1C27 5012             1C28 1790        DC    XL2'5012'   12  ERROR. HANG
    1C29 9815             1C2A 1791        DC    XL2'9815'   13  BOC.2 MUST BRANCH
    1C2B 5014             1C2C 1792        DC    XL2'5014'   14  ERROR. HANG
    1C2D 9417             1C2E 1793        DC    XL2'9417'   15  BOC.1 MUST BRANCH
    1C2F 5016             1C30 1794        DC    XL2'5016'   16  ERROR. HANG
    1C31 5017             1C32 1795 ROCMCE DC    XL2'5017'   17  HANG. TEST COMPLETED OKAY
                               1796
                               1796
                               1797 *****************************************************************
                               1798 *      ROUTINE OF - TBFR MICRO INSTRUCTION                      *
                               1799 *****************************************************************
                               1800 *                                                               *
                               1801 *      THIS ROUTINE TESTS THE TBFR MICRO INSTRUCTION            *
                               1802 *                                                               *
                               1803 *****************************************************************
                               1804
    1C33 0F               1C33 1805 RTOF   DC    XL1'0F'                     ROUTINE NUMBER
    1C34 00               1C34 1806        DC    XL1'00'                     NO MANUAL INTERVENTION
    1C35 1C9A             1C36 1807        DC    AL2(RT10)                   ADDRESS OF NEXT ROUTINE
                               1808
                          1C48 1809        USING RODK01.XR1
    1C37 C2 01 1C48            1810        LA    RODK01.XR1                  INITIALIZE XR1 FOR INDEXIN
                               1811
    1C3B 1C 05 5A38 19         1812        MVC   MICOP.RTODOP(6.XR1)         MOVE OP BEING TESTED TO
    1C40 C0 87 021A            1813        B     PRINT                       PRINT ROUTINE HEADING
    1C44 01               1C44 1814        DC    XL1'01'
    1C45 19               1C45 1815        DC    IL1'25'
    1C46 5A46             1C47 1816        DC    AL2(MICPRT)
    1C48 C0 87 5918            1817 RODK01 B     LOADCS                      .GO LOAD MICROPROGRAM
    1C4C 83               1C4C 1818        DC    XL1'83'                     .DISABLE UPON ENTRY. FILL 2ND
                               1819 *                                         FSQ WITH BOS.0 ON ADDRESS
    1C4D 1C62             1C4E 1820        DC    AL2(RODMCS)                 .START OF MICRO CODE***
    1C4F 1C99             1C50 1821        DC    AL2(RODMCE)                 .END OF MICROCODE***
                               1822
    1C51 C0 87 54FE            1823        B     DOMICR                      .GO EXECUTE MICROPROGRAM
    1C55 44               1C55 1824        DC    XL1'44'                     .ERROR HALT  -44-
    1C56 501B             1C57 1825        DC    XL2'501B'                   .EXPECTED DATA
                               1826
    1C58 C0 87 0216            1827        B     LINK                        .GO TO NEXT ROUTINE
```

8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              1828
   1C5C F0C6E3C2C6D9     1C61 1829 RTODOP DC    CL6'0FTBFR'             ***
                              1830
                         1C62 1831 R0DMCS EQU   *
   1C62 7A55             1C63 1832        DC    XL2'7A55'    00  IC SET MDB A =55
   1C64 7BAA             1C65 1833        DC    XL2'7BAA'    01  IC SET MDB B =AA
   1C66 7CAC             1C67 1834        DC    XL2'7CAC'    02  IC SET MDB C =AC
   1C68 7DBD             1C69 1835        DC    XL2'7DBD'    03  IC SET MDB D =BD
   1C6A 7E35             1C6B 1836        DC    XL2'7E35'    04  IC SET MDB E =35
   1C6C 7F41             1C6D 1837        DC    XL2'7F41'    05  IC SET MDB F =41
   1C6E 8A0D             1C6F 1838        DC    XL2'8A0D'    06  TBFR RESETS ALL CONDITIONS
   1C70 9D00             1C71 1839        DC    XL2'9D00'    07  BOC3 MUST NOT BRANCH TO 100
   1C72 9901             1C73 1840        DC    XL2'9901'    08  BOC2 MUST NOT BRANCH TO 101
   1C74 9502             1C75 1841        DC    XL2'9502'    09  BOC1 MUST NOT BRANCH TO 102
   1C76 8A0C             1C77 1842        DC    XL2'8A0C'    0A  TBFR SETS COND1,NOT2AND3
   1C78 9D03             1C79 1843        DC    XL2'9D03'    0B  BOC3 MUST NOT BRANCH TO 103
   1C7A 9904             1C7B 1844        DC    XL2'9904'    0C  BOC2 MUST NOT BRANCH TO 104
   1C7C 940F             1C7D 1845        DC    XL2'940F'    0D  BOC1 MUST BR
   1C7E 500E             1C7F 1846        DC    XL2'500E'    0E  ERROR HANG
   1C80 8B0E             1C81 1847        DC    XL2'8B0E'    0F  TBFR SETS COND2,NOT1AND3
   1C82 9D05             1C83 1848        DC    XL2'9D05'    10  BOC3 MUST NOT BRANCH TO 105
   1C84 9506             1C85 1849        DC    XL2'9506'    11  BOC1 MUST NOT BRANCH TO 106
   1C86 9814             1C87 1850        DC    XL2'9814'    12  BOC2 MUST BRANCH
   1C88 5013             1C89 1851        DC    XL2'5013'    13  ERROR HANG
   1C8A 850F             1C8B 1852        DC    XL2'850F'    14  TBFR SETS ALL CONDITIONS
   1C8C 9C17             1C8D 1853        DC    XL2'9C17'    15  BOC3 MUST BRANCH
   1C8E 5016             1C8F 1854        DC    XL2'5016'    16  ERROR HANG
   1C90 9819             1C91 1855        DC    XL2'9819'    17  BOC2 MUST BRANCH
   1C92 5018             1C93 1856        DC    XL2'5018'    18  ERROR HANG
   1C94 941B             1C95 1857        DC    XL2'941B'    19  BOC1 MUST BRANCH
   1C96 501A             1C97 1858        DC    XL2'501A'    1A  ERROR HANG
   1C98 501B             1C99 1859 R0DMCE DC    XL2'501B'    1B  HANG TEST COMPLETED OKAY
                              1860 ********************************************************************
                              1861 *      ROUTINE 10 - XR MICRO INSTRUCTION TEST                      *
                              1862 ********************************************************************
                              1863 *                                                                  *
                              1864 *      THIS ROUTINE TESTS THE XR MICRO INSTRUCTION                 *
                              1865 *                                                                  *
                              1866 ********************************************************************
                              1867
   1C9A 10               1C9A 1868 RT10   DC    XL1'10'                 ROUTINE NUMBER
   1C9B 00               1C9B 1869        DC    XL1'00'                 NO MANUAL INTERVENTION
   1C9C 1CE9             1C9D 1870        DC    AL2(RT11)               ADDRESS OF NEXT ROUTINE
                              1871
                         1CAF 1872        USING R10K01,XR1
   1C9E C2 01 1CAF            1873        LA    R10K01,XR1              INITIALIZE XR1 FOR INDEXING
                              1874
   1CA2 1C 05 5A38 19         1875        MVC   MICOP,RT100P(6,XR1)     MOVE OP BEING TESTED TO
   1CA7 C0 87 021A            1876        B     PRINT                   PRINT ROUTINE HEADING
   1CAB 01               1CAB 1877        DC    XL1'01'
   1CAC 19               1CAC 1878        DC    IL1'25'
   1CAD 5A46             1CAE 1879        DC    AL2(MICPRT)
                              1880
   1CAF C0 87 5918            1881 R10K01 B     LOADCS                  *GO LOAD MICROPROGRAM
   1CB3 83               1CB3 1882        DC    XL1'83'                 *DISABLE UPON ENTRY, FILL 2ND
                              1883 *                                       FSQ WITH 80S,0 ON ADDRESS
   1CB4 1CC9             1CB5 1884        DC    AL2(R10MCS)             *START OF MICRO CODE
   1CB6 1CE8             1CB7 1885        DC    AL2(R10MCE)             *END OF MICROCODE
                              1886
   1CB8 C0 87 54FE            1887        B     DOMICR                  *GO EXECUTE MICROPROGRAM
   1CBC 4A               1CBC 1888        DC    XL1'4A'                 *ERROR HALT  -4A-
   1CBD 500F             1CBE 1889        DC    XL2'500F'               *EXPECTED RESULT
                              1890
   1CBF C0 87 0216            1891        B     LINK                    *GO TO NEXT ROUTINE
                              1892
   1CC3 F1F04040E7D9     1CC8 1893 RT100P DC    CL6'10  XR'
                              1894
                              1895 *-----------------------------*
```


8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              1896 * START OF MICROPROGRAM LISTING *
                              1897 *-----------------------------*
                         1CC9 1898 R10MCS EQU   *
   1CC9 73FF             1CCA 1899        DC    XL2'73FF'    00  IC, SET MDB 3 = FF
   1CCB 7100             1CCC 1900        DC    XL2'7100'    01  IC, SET MDB 1 = 00
   1CCD 72D3             1CCE 1901        DC    XL2'72D3'    02  IC, SET MDB 2 = D3
   1CCF A201             1CD0 1902        DC    XL2'A201'    03  XR D3 WITH 00 SHOULD BE NO CHANGE
   1CD1 E2D3             1CD2 1903        DC    XL2'E2D3'    04  CI TO BE SURE MDB 2 = D3
   1CD3 9C07             1CD4 1904        DC    XL2'9C07'    05  BOC,3 MUST BRANCH
   1CD5 5006             1CD5 1905        DC    XL2'5006'    06  ERROR, HANG
   1CD7 A203             1CD8 1906        DC    XL2'A203'    07  XR D3 WITH FF TO INVERT ALL BITS
   1CD9 E22C             1CDA 1907        DC    XL2'E22C'    08  CI TO TEST MDB 2 = 2C
   1CDB 9C0B             1CDC 1908        DC    XL2'9C0B'    09  BOC,3 MUST BRANCH
   1CDD 500A             1CDE 1909        DC    XL2'500A'    0A  ERROR, HANG
   1CDF A302             1CE0 1910        DC    XL2'A302'    0B  XR FF WITH 2C
   1CE1 E3D3             1CE2 1911        DC    XL2'E3D3'    0C  CI TO CHECK MDB 3 = D3
   1CE3 9C0F             1CE4 1912        DC    XL2'9C0F'    0D  BOC,3 MUST BRANCH
   1CE5 500E             1CE6 1913        DC    XL2'500E'    0E  ERROR, HANG
   1CE7 800F             1CE8 1914 R10MCE DC    XL2'800F'    0F  HANG, TEST COMPLETED
                              1915
                              1915
                              1916 ********************************************************************
                              1917 *      ROUTINE 11 - CIR MICRO INSTRUCTION TESTS                    *
                              1918 ********************************************************************
                              1919 *                                                                  *
                              1920 *      THIS ROUTINE TESTS THE CIR MICRO INSTRUCTION                *
                              1921 *                                                                  *
                              1922 ********************************************************************
                              1923
   1CE9 11               1CE9 1924 RT11   DC    XL1'11'                 ROUTINE NUMBER
   1CEA 00               1CEA 1925        DC    XL1'00'                 NO MANUAL INTERVENTION
   1CEB 1D38             1CEC 1926        DC    AL2(RT12)               ADDRESS OF NEXT ROUTINE
                              1927
                         1CFE 1928        USING R0FK01,XR1
   1CED C2 01 1CFE            1929        LA    R0FK01,XR1              INITIALIZE XR1 FOR INDEXING
                              1930
   1CF1 1C 05 5A38 19         1931        MVC   MICOP,RT0FOP(6,XR1)     MOVE OP BEING TESTED TO
   1CF6 C0 87 021A            1932        B     PRINT                   PRINT ROUTINE HEADING
   1CFA 01               1CFA 1933        DC    XL1'01'
   1CFB 19               1CFB 1934        DC    IL1'25'
   1CFC 5A46             1CFD 1935        DC    AL2(MICPRT)
                              1936
   1CFE C0 87 5918            1937 R0FK01 B     LOADCS                  *GO LOAD MICROPROGRAM
   1D02 83               1D02 1938        DC    XL1'83'                 *DISABLE UPON ENTRY, FILL 2ND
                              1939 *                                       FSQ WITH 80S,0 ON ADDRESS
   1D03 1D18             1D04 1940        DC    AL2(R0FMCS)             *START OF MICRO CODE
   1D05 1D37             1D06 1941        DC    AL2(R0FMCE)             *END OF MICROCODE
                              1942
   1D07 C0 87 54FE            1943        B     DOMICR                  *GO EXECUTE MICRO CODE
   1D0B 48               1D0B 1944        DC    XL1'48'                 *ERROR HALT  -48-
   1D0C 500F             1D0D 1945        DC    XL2'500F'               *EXPECTED RESULT
                              1946
   1D0E C0 87 0216            1947        B     LINK                    *GO TO NEXT ROUTINE
                              1948
   1D12 F1F140C3C9D9     1D17 1949 RT0FOP DC    CL6'11 CIR'
                              1950
                              1951 *-----------------------------*
                              1952 * START OF MICROPROGRAM LISTING *
                              1953 *-----------------------------*
                         1D18 1954 R0FMCS EQU   *
   1D18 7E5C             1D19 1955        DC    XL2'7E5C'    00  IC SET MDB E = 5C
   1D1A 7F58             1D1B 1956        DC    XL2'7F58'    01  IC SET MDB F = 58
   1D1C 7681             1D1D 1957        DC    XL2'7681'    02  IC SET MDB 6 = 81
   1D1E 715C             1D1F 1958        DC    XL2'715C'    03  IC SET MDB 1 = 5C
   1D20 8E06             1D21 1959        DC    XL2'8E06'    04  CIR RESETS ALL CONDITIONS
   1D22 9D00             1D23 1960        DC    XL2'9D00'    05  BOC,3 MUST NOT BRANCH
   1D24 9901             1D25 1961        DC    XL2'9901'    06  BOC,2 MUST NOT BRANCH
   1D26 9502             1D27 1962        DC    XL2'9502'    07  BOC,1 MUST NOT BRANCH
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    1D28 BE01             1D29 1963        DC     XL2'BE01'  08  CIR. SETS ALL CONDITIONS
    1D2A 9C08             1D2B 1964        DC     XL2'9C08'  09  BOC.3 MUST BRANCH
    1D2C 500A             1D2D 1965        DC     XL2'500A'  0A  ERROR. HANG
    1D2E BF0E             1D2F 1966        DC     XL2'BF0E'  0B  CIR.SETS COND 1 RESETS 2. 3
    1D30 940E             1D31 1967        DC     XL2'940E'  0C  BOC.1 MUST BRANCH
    1D32 500D             1D33 1968        DC     XL2'500D'  0D  ERROR. HANG
    1D34 9D03             1D35 1969        DC     XL2'9D03'  0E  BOC.3 MUST NOT BRANCH
    1D36 500F             1D37 1970 ROFMCE DC     XL2'500F'  0F  HANG. TEST COMPLETED
                               1971
                               1971
                               1972 **************************************************************
                               1973 *       ROUTINE 12 - CI MICRO INTRUCTION TESTS               *
                               1974 **************************************************************
                               1975 *                                                            *
                               1976 *       THIS ROUTINE TEST THE CI MICRO INSTRUCTION           *
                               1977 *                                                            *
                               1978 **************************************************************
                               1979
    1D38 12               1D38 1980 RT12   DC     XL1'12'                 ROUTINE NUMBER
    1D39 00               1D39 1981        DC     XL1'00'                 NO MANUAL INTERVENTION
    1D3A 1D89             1D3B 1982        DC     AL2(RT13)               ADDRESS OF NEXT ROUTINE
                               1983
                          1D40 1984        USING ROEK01.XR1
    1D3C C2 01 1D4D            1985        LA     ROEK01.XR1              INITIALIZE XR1 FOR INDEXING
                               1986
    1D40 1C 05 5A38 19         1987        MVC    MICOP.RTOEOP(6.XR1)     MOVE OP BEING TESTED TO
    1D45 C0 87 021A            1988        B      PRINT                   PRINT ROUTINE HEADING
    1D49 01               1D49 1989        DC     XL1'01'
    1D4A 19               1D4A 1990        DC     IL1'25'
    1D4B 5A46             1D4C 1991        DC     AL2(MICPRT)
                               1992
    1D4D C0 87 5918            1993 ROEK01 B      LOADCS                  .GO LOAD MICROPROGRAM
    1D51 83               1D51 1994        DC     XL1'83'                 .DISABLE UPON ENTRY. FILL 2ND
                               1995 *                                      FSQ WITH BCS.0 ON ADDRESS
    1D52 1D67             1D53 1996        DC     AL2(ROEMCS)             .START OF MICRO CODE
    1D54 1D88             1D55 1997        DC     AL2(ROEMCE)             .END OF MICROCODE
                               1998
    1D56 C0 87 54FE            1999        B      DOMICR                  .GO EXECUTE MICRO PROGRAM
    1D5A 46               1D5A 2000        DC     XL1'46'                 .ERROR HALT  -46-
    1D5B 5010             1D5C 2001        DC     XL2'5010'               .EXPECTED RESULT
                               2002
    1D5D C0 87 0216            2003        B      LINK                    .GO TO NEXT ROUTINE
                               2004
    1D61 F1F24040C3C9     1D66 2005 RTOEOP DC     CL6'12  CI'
                               2006
                               2007 *------------------------------*
                               2008 * START OF MICROPROGRAM LISTING *
                               2009 *------------------------------*
                          1D67 2010 ROEMCS EQU    *
    1D67 7CAA             1D68 2011        DC     XL2'7CAA'  00  IC SET HDB C = AA
    1D69 7D77             1D6A 2012        DC     XL2'7D77'  01  IC SET HDB D = 77
    1D6B ECB8             1D6C 2013        DC     XL2'ECB8'  02  CI AND RESET ALL CONDITIONS
    1D6D 9D00             1D6E 2014        DC     XL2'9D00'  03  BOC.3 MUST NOT BRANCH
    1D6F 9901             1D70 2015        DC     XL2'9901'  04  BOC.2 MUST NOT BRANCH
    1D71 9502             1D72 2016        DC     XL2'9502'  05  BOC.1 MUST NOT BRANCH
    1D73 ECAA             1D74 2017        DC     XL2'ECAA'  06  CI AND SET ALL CONDITIONS ON
    1D75 9C09             1D76 2018        DC     XL2'9C09'  07  BOC.3 MUST BRANCH
    1D77 5008             1D78 2019        DC     XL2'5008'  08  ERROR. HANG
    1D79 ED7F             1D7A 2020        DC     XL2'ED7F'  09  CI AND SET COND 1 ON. 2 AND 3 OFF
    1D7B 9D03             1D7C 2021        DC     XL2'9D03'  0A  BOC.3 MUST NOT BRANCH
    1D7D 940D             1D7E 2022        DC     XL2'940D'  0B  BOC.1 MUST BRANCH
    1D7F 500C             1D80 2023        DC     XL2'500C'  0C  ERROR. HANG
    1D81 ED77             1D82 2024        DC     XL2'ED77'  0D  SET ALL CONDITIONS ON
    1D83 9C10             1D84 2025        DC     XL2'9C10'  0E  BOC.3 MUST BRANCH
    1D85 500F             1D86 2026        DC     XL2'500F'  0F  ERROR. HANG
    1D87 5010             1D88 2027 ROEMCE DC     XL2'5010'  10  HANG. TEST COMPLETE
                               2028
                               2028
```



```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                               2029 ******************************************************************
                               2030 *       ROUTINE 13 - BR MICRO INSTRUCTION TESTS                  *
                               2031 ******************************************************************
                               2032 *                                                                *
                               2033 *       THIS ROUTINE TESTS THE BRANCH REGISTER INSTRUCTION       *
                               2034 *       WITHIN THE FIRST 1K ADDRESS ONLY. USING ONLY REGS 00 TO 0F. *
                               2035 *                                                                *
                               2036 *       BRANCH REGISTERS ARE DONE AS FOLLOWS:                    *
                               2037 *                                                                *
                               2038 *           FROM ADDRESS 000 TO ADDRESS 101.                     *
                               2039 *           FROM ADDRESS 101 TO ADDRESS 202.                     *
                               2040 *           FROM ADDRESS 202 TO ADDRESS 303.                     *
                               2041 *           FROM ADDRESS 303 TO ADDRESS 004.                     *
                               2042 *           FROM ADDRESS 004 TO ADDRESS 205.                     *
                               2043 *           FROM ADDRESS 205 TO ADDRESS 006.                     *
                               2044 *           FROM ADDRESS 006 TO ADDRESS 307.                     *
                               2045 *           FROM ADDRESS 307 TO ADDRESS 108.                     *
                               2046 *           FROM ADDRESS 108 TO ADDRESS 10A.                     *
                               2047 *           FROM ADDRESS 10A TO ADDRESS 30B.                     *
                               2048 *           FROM ADDRESS 30B TO ADDRESS 20C.                     *
                               2049 *           FROM ADDRESS 20C TO ADDRESS 20E.                     *
                               2050 *           FROM ADDRESS 20E TO ADDRESS 00F.                     *
                               2051 *                                                                *
                               2052 ******************************************************************
                               2053
    1D89 13               1D89 2054 RT13   DC     XL1'13'                 ROUTINE NUMBER
    1D8A 00               1D8A 2055        DC     XL1'00'                 NO MANUAL INTERVENTION
    1D8B 1E93             1D8C 2056        DC     AL2(RT14)               ADDRESS OF NEXT ROUTINE
                               2057
                          1D99 2058        USING R11K01.XR1
    1D8D C2 01 1D99            2059        LA     R11K01.XR1              INITIALIZE XR1 FOR INDEXING
                               2060
    1D91 C0 87 021A            2061        B      PRINT                   PRINT ROUTINE HEADING
    1D95 01               1D95 2062        DC     XL1'01'
    1D96 27               1D96 2063        DC     IL1'39'
    1D97 1DEE             1D98 2064        DC     AL2(R11HDR)
                               2065
    1D99 C0 87 5918            2066 R11K01 B      LOADCS                  .GO LOAD MICROPROGRAM
    1D9D 91               1D9D 2067        DC     XL1'91'                 .LOAD CODE IN 1ST FSQ
    1D9E 1DEF             1D9F 2068        DC     AL2(R11MCS)             .START OF MICRO CODE
    1DA0 1E32             1DA1 2069        DC     AL2(R11MCE)             .END OF MICROCODE
    1DA2 C0 87 5918            2070        B      LOADCS                  .LOAD CODE IN SECOND FSQ
    1DA6 B2               1DA6 2071        DC     XL1'B2'
    1DA7 1E33             1DA8 2072        DC     AL2(R11MC2)
    1DA9 1E52             1DAA 2073        DC     AL2(R11MC3)
    1DAB C0 87 5918            2074        B      LOADCS                  .LOAD CODE IN 3RD 256 WDS
    1DAF B4               1DAF 2075        DC     XL1'B4'
    1DB0 1E53             1DB1 2076        DC     AL2(R11MC4)
    1DB2 1E72             1DB3 2077        DC     AL2(R11MC5)
    1DB4 C0 87 5918            2078        B      LOADCS                  .LOAD CODE IN 4TH 256 WDS
    1DB8 A8               1DB8 2079        DC     XL1'A8'
    1DB9 1E73             1DBA 2080        DC     AL2(R11MC6)
    1DBB 1E92             1DBC 2081        DC     AL2(R11MC7)
                               2082
    1DBD C0 87 54FE            2083        B      DOMICR                  .GO EXECUTE MICROCODE
    1DC1 4E               1DC1 2084        DC     XL1'4E'                 .ERROR HALT  -4E-
    1DC2 500F             1DC3 2085        DC     XL2'500F'               .EXPECTED DATA
                               2086
    1DC4 C0 87 0216            2087        B      LINK                    .GO TO NEXT ROUTINE
                               2088
    1DC8 D9D6E4E340F1F340 1DEE 2089 R11HDR DC     CL39'ROUT 13 BR MICRO OP TEST: 1K ADDRESSES'
    1DD0 C2D940D4C9C3D9D6      2089
    1DD8 40D6D740E3C5E2E3      2089
    1DE0 5E40F1D240C1C4C4      2089
    1DE8 D9C5E2E2C5E24C        2089
                               2090
                               2091 *------------------------------*
                               2092 * START OF MICROPROGRAM LISTING *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2093 *-------------------------------*
                    1DEF 2094 R11MCS EQU  *
   1DEF 5010        1DF0 2095        DC   XL2'5010'      000 BDS,0 TO ADDRESS 010
   1DF1 5001        1DF2 2096        DC   XL2'5001'      001 ERROR, HANG.
   1DF3 5002        1DF4 2097        DC   XL2'5002'      002 ERROR, HANG.
   1DF5 5003        1DF6 2098        DC   XL2'5003'      003 ERROR, HANG.
   1DF7 3205        1DF8 2099        DC   XL2'3205'      004 BR TO ADDRESS 205
   1DF9 5005        1DFA 2100        DC   XL2'5005'      005 ERROR, HANG
   1DFB 3307        1DFC 2101        DC   XL2'3307'      006 BR TO ADDRESS 307
   1DFD 5007        1DFE 2102        DC   XL2'5007'      007 ERROR, HANG
   1DFF 5008        1E00 2103        DC   XL2'5008'      008 ERROR, HANG
   1E01 5009        1E02 2104        DC   XL2'5009'      009 ERROR, HANG
   1E03 500A        1E04 2105        DC   XL2'500A'      00A ERROR, HANG
   1E05 500B        1E06 2106        DC   XL2'500B'      00B ERROR, HANG
   1E07 500C        1E08 2107        DC   XL2'500C'      00C ERROR, HANG
   1E09 500D        1E0A 2108        DC   XL2'500D'      00D ERROR, HANG
   1E0B 500E        1E0C 2109        DC   XL2'500E'      00E ERROR, HANG
   1E0D 500F        1E0E 2110        DC   XL2'500F'      00F EXPECTED DATA
   1E0F 7000        1E10 2111        DC   XL2'7000'      010 IC HDB 00=00
   1E11 71C1        1E12 2112        DC   XL2'7101'      011 IC HDB 01=01
   1E13 7202        1E14 2113        DC   XL2'7202'      012 IC HDB 02=02
   1E15 7303        1E16 2114        DC   XL2'7303'      013 IC HDB 03=03
   1E17 7404        1E18 2115        DC   XL2'7404'      014 IC HDB 04=04
   1E19 7505        1E1A 2116        DC   XL2'7505'      015 IC HDB 05=05
   1E1B 7606        1E1C 2117        DC   XL2'7606'      016 IC HDB 06=06
   1E1D 7707        1E1E 2118        DC   XL2'7707'      017 IC HDB 07=07
   1E1F 7808        1E20 2119        DC   XL2'7808'      018 IC HDB 08=08
   1E21 7909        1E22 2120        DC   XL2'7909'      019 IC HDB 09=09
   1E23 7A0A        1E24 2121        DC   XL2'7A0A'      01A IC HDB 0A=A
   1E25 7B0B        1E26 2122        DC   XL2'7B0B'      01B IC HDB 0B=0B
   1E27 7C0C        1E28 2123        DC   XL2'7C0C'      01C IC HDB 0C=0C
   1E29 7D0D        1E2A 2124        DC   XL2'7D0D'      01D IC HDB 0D=0D
   1E2B 7E0E        1E2C 2125        DC   XL2'7E0E'      01E IC HDB 0E=0E
   1E2D 7F0F        1E2E 2126        DC   XL2'7F0F'      01F IC HDB 0F=0F
   1E2F 3101        1E30 2127        DC   XL2'3101'      020 BR TO ADDRESS 101
   1E31 5021        1E32 2128 R11MCE DC   XL2'5021'      021 ERROR, HANG
                    1E33 2129 R11MC2 EQU  *
   1E33 5100        1E34 2130        DC   XL2'5100'      100 ERROR, HANG
   1E35 3202        1E36 2131        DC   XL2'3202'      101 BR TO ADDRESS 202.
   1E37 5102        1E38 2132        DC   XL2'5102'      102 ERROR, HANG
   1E39 5103        1E3A 2133        DC   XL2'5103'      013 ERROR, HANG
   1E3B 5104        1E3C 2134        DC   XL2'5104'      014 ERROR, HANG
   1E3D 5105        1E3E 2135        DC   XL2'5105'      015 ERROR, HANG
   1E3F 5106        1E40 2136        DC   XL2'5106'      016 ERROR, HANG
   1E41 5107        1E42 2137        DC   XL2'5107'      017 ERROR, HANG
   1E43 310A        1E44 2138        DC   XL2'310A'      108 BR TO ADDRESS 10A
   1E45 5109        1E46 2139        DC   XL2'5109'      109 ERROR, HANG
   1E47 3308        1E48 2140        DC   XL2'3308'      10A BR TO ADDRESS 30B
   1E49 510B        1E4A 2141        DC   XL2'510B'      10B ERROR, HANG
   1E4B 510C        1E4C 2142        DC   XL2'510C'      10C ERROR, HANG
   1E4D 510D        1E4E 2143        DC   XL2'510D'      10D ERROR, HANG
   1E4F 510E        1E50 2144        DC   XL2'510E'      10E ERROR, HANG
   1E51 510F        1E52 2145 R11MC3 DC   XL2'510F'      10F ERROR, HANG
                    1E53 2146 R11MC4 EQU  *
   1E53 5200        1E54 2147        DC   XL2'5200'      200 ERROR, HANG
   1E55 5201        1E56 2148        DC   XL2'5201'      201 ERROR, HANG
   1E57 3303        1E58 2149        DC   XL2'3303'      202 BR TO ADDRESS 303
   1E59 5203        1E5A 2150        DC   XL2'5203'      203 ERROR, HANG
   1E5B 5204        1E5C 2151        DC   XL2'5204'      204 ERROR, HANG
   1E5D 3006        1E5E 2152        DC   XL2'3006'      205 BR TO ADDRESS 006
   1E5F 5206        1E60 2153        DC   XL2'5206'      206 ERROR, HANG
   1E61 5207        1E62 2154        DC   XL2'5207'      207 ERROR, HANG
   1E63 5208        1E64 2155        DC   XL2'5208'      208 ERROR, HANG
   1E65 5209        1E66 2156        DC   XL2'5209'      209 ERROR, HANG
   1E67 520A        1E68 2157        DC   XL2'520A'      20A ERROR, HANG
   1E69 520B        1E6A 2158        DC   XL2'520B'      20B ERROR, HANG
   1E6B 320E        1E6C 2159        DC   XL2'320E'      20C BR TO ADDRESS 20E
   1E6D 520D        1E6E 2160        DC   XL2'520D'      20D ERROR, HANG
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1E6F 300F        1E70 2161        DC   XL2'300F'      20E BR TO ADDRESS 00F
   1E71 520F        1E72 2162 R11MC5 DC   XL2'520F'      20F ERROR, HANG
                    1E73 2163 R11MC6 EQU  *
   1E73 5300        1E74 2164        DC   XL2'5300'      300 ERROR, HANG
   1E75 5301        1E76 2165        DC   XL2'5301'      301 ERROR, HANG
   1E77 5302        1E78 2166        DC   XL2'5302'      302 ERROR, HANG
   1E79 3004        1E7A 2167        DC   XL2'3004'      303 BR TO ADDRESS 004
   1E7B 5304        1E7C 2168        DC   XL2'5304'      304 ERROR, HANG
   1E7D 5305        1E7E 2169        DC   XL2'5305'      305 ERROR, HANG
   1E7F 5306        1E80 2170        DC   XL2'5306'      306 ERROR, HANG
   1E81 3108        1E82 2171        DC   XL2'3108'      307 BR TO ADDRESS 108
   1E83 5308        1E84 2172        DC   XL2'5308'      308 ERROR, HANG
   1E85 5309        1E86 2173        DC   XL2'5309'      309 ERROR, HANG
   1E87 530A        1E88 2174        DC   XL2'530A'      30A ERROR, HANG
   1E89 320C        1E8A 2175        DC   XL2'320C'      30B BR TO ADDRESS 20C
   1E8B 530C        1E8C 2176        DC   XL2'530C'      30C ERROR, HANG
   1E8D 530D        1E8E 2177        DC   XL2'530D'      30D ERROR, HANG
   1E8F 530E        1E90 2178        DC   XL2'530E'      30E ERROR, HANG
   1E91 530F        1E92 2179 R11MC7 DC   XL2'530F'      30F ERROR, HANG
                    2180
                    2180
                    2181 *****************************************************************
                    2182 *      ROUTINE 14 - INC MICRO INSTRUCTION TEST                  *
                    2183 *****************************************************************
                    2184 *                                                               *
                    2185 *      THIS ROUTINE TESTS THE INC MICRO INSTRUCTION.  ALL COMBINATIONS*
                    2186 *      OF INCREMENT FROM 1-256 ARE TRIED.                       *
                    2187 *                                                               *
                    2188 *****************************************************************
                    2189
   1E93 14          1E93 2190 RT14   DC   XL1'14'       ROUTINE NUMBER
   1E94 00          1E94 2191        DC   XL1'00'       NO MANUAL INTERVENTION
   1E95 1F27        1E96 2192        DC   AL2(RT15)     ADDRESS OF NEXT ROUTINE
                    2193
                    1EA8 2194        USING R12K01,XR1
   1E97 C2 01 1EA8  2195        LA   R12K01,XR1         INITIALIZE XR1 FOR INDEXING
                    2196
   1E9B 1C 05 5A38 22 2197      MVC  MICOP,RT120P(6,XR1) MOVE OP BEING TESTED TO
   1EA0 C0 87 021A  2198        B    PRINT              PRINT ROUTINE HEADING
   1EA4 01          1EA4 2199        DC   XL1'01'
   1EA5 19          1EA5 2200        DC   IL1'25'
   1EA6 5A46        1EA7 2201        DC   AL2(MICPRT)
                    2202
   1EA8 C0 87 5918  2203 R12K01 B    LOADCS             ,GO LOAD MICROPROGRAM
   1EAC 91          1EAC 2204        DC   XL1'91'       ,LOAD 1ST FSQ
   1EAD 1ECB        1EAE 2205        DC   AL2(R12MCS)   ,START OF MICRO CODE
   1EAF 1F02        1EB0 2206        DC   AL2(R12MCE)   ,END OF MICROCODE
   1EB1 C0 87 5918  2207        B    LOADCS             ,GO LOAD MICROPROGRAM
   1EB5 A2          1EB5 2208        DC   XL1'A2'       ,LOAD 2ND FSQ
   1EB6 1F03        1EB7 2209        DC   AL2(R12MC2)
   1EB8 1F26        1EB9 2210        DC   AL2(R12MC3)
                    2211
   1EBA C0 87 54FE  2212        B    DOMICR             ,GO EXECUTE MICROPROGRAM
   1EBE 50          1EBE 2213        DC   XL1'50'       ,ERROR HALT -50-
   1EBF 5018        1EC0 2214        DC   XL2'5018'     ,EXPECTED RESULT
                    2215
   1EC1 C0 87 0216  2216        B    LINK               ,GO TO NEXT ROUTINE
                    2217
   1EC5 F1F440C9D5C3 1ECA 2218 RT120P DC  CL6'14 INC'
                    2219
                    2220 *-------------------------------*
                    2221 * START OF MICROPROGRAM LISTING *
                    2222 *-------------------------------*
                    1ECB 2223 R12MCS EQU  *
   1ECB 7A00        1ECC 2224        DC   XL2'7A00'     00  IC, SET HDB A = 00
   1ECD 7704        1ECE 2225        DC   XL2'7704'     01  IC, PUT RETURN ADDR IN HDB 7
   1ECF 7600        1ED0 2226        DC   XL2'7600'     02  IC, SET HDB 6 = 00
   1ED1 5100        1ED2 2227        DC   XL2'5100'     03  BDS,0 BRANCH TO INCREMENT ROUTINE
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1ED3 EA10             1ED4 2228          DC    XL2'EA10'    04  CI, HDB A MUST HAVE 10 IN IT
   1ED5 9C07             1ED6 2229          DC    XL2'9C07'    05  BOC,3 MUST BRANCH
   1ED7 5006             1ED8 2230          DC    XL2'5006'    06  ERROR, HANG
   1ED9 7B01             1EDA 2231          DC    XL2'7B01'    07  IC, SET HDB B = 01
   1EDB 770A             1EDC 2232          DC    XL2'770A'    08  IC, PUT RETURN ADDR IN HDB 7
   1EDD 5100             1EDE 2233          DC    XL2'5100'    09  BOS,0 BRANCH TO INCREMENT ROUTINE
   1EDF 1B10             1EE0 2234          DC    XL2'1B10'    0A  INCREMENT HDB B
   1EE1 1B40             1EE2 2235          DC    XL2'1B40'    0B  SHIFT HDB B LEFT
   1EE3 1B40             1EE4 2236          DC    XL2'1B40'    0C    4 TIMES
   1EE5 1B40             1EE6 2237          DC    XL2'1B40'    0D
   1EE7 1B40             1EE8 2238          DC    XL2'1B40'    0E
   1EE9 9418             1EEA 2239          DC    XL2'9418'    0F  BRANCH TO END IF HI BITS = 0
   1EEB BA0B             1EEC 2240          DC    XL2'BA0B'    10  CIR, COMPARE FOR CORRECT RESULT
   1EED 9C13             1EEE 2241          DC    XL2'9C13'    11  WILL BRANCH IF OKAY
   1EEF 5012             1EF0 2242          DC    XL2'5012'    12  ERROR, HANG
   1EF1 1B40             1EF2 2243          DC    XL2'1B40'    13  SHIFT HDB B AROUND AGAIN
   1EF3 1B40             1EF4 2244          DC    XL2'1B40'    14
   1EF5 1B40             1EF6 2245          DC    XL2'1B40'    15
   1EF7 1B40             1EF8 2246          DC    XL2'1B40'    16
   1EF9 5100             1EFA 2247          DC    XL2'5100'    17  RETURN TO INCREMENT ROUTINE
   1EFB EA00             1EFC 2248          DC    XL2'EA00'    18  END, TEST THAT HDB A = 00
   1EFD 9C1B             1EFE 2249          DC    XL2'9C1B'    19  MUST BRANCH
   1EFF 501A             1F00 2250          DC    XL2'501A'    1A  ERROR, HANG
   1F01 501B             1F02 2251 R12MCE   DC    XL2'501B'    1B  HANG, END OF TEST
                         2252
                         1F03 2253 R12MC2   EQU   *

   1F03 1A10             1F04 2254          DC    XL2'1A10'   100  INCREMENT ROUTINE, INCREMENTS HDB A
   1F05 1A10             1F06 2255          DC    XL2'1A10'   101    16 TIMES AND RETURNS TO MAIN ROUTINE,
   1FC7 1A10             1F08 2256          DC    XL2'1A10'   102
   1F09 1A10             1F0A 2257          DC    XL2'1A10'   103
   1F0B 1A10             1F0C 2258          DC    XL2'1A10'   104
   1F0D 1A10             1F0E 2259          DC    XL2'1A10'   105
   1F0F 1A10             1F10 2260          DC    XL2'1A10'   106
   1F11 1A10             1F12 2261          DC    XL2'1A10'   107
   1F13 1A10             1F14 2262          DC    XL2'1A10'   108
   1F15 1A10             1F16 2263          DC    XL2'1A10'   109
   1F17 1A10             1F18 2264          DC    XL2'1A10'   10A
   1F19 1A10             1F1A 2265          DC    XL2'1A10'   10B
   1F1B 1A10             1F1C 2266          DC    XL2'1A10'   10C
   1F1D 1A10             1F1E 2267          DC    XL2'1A10'   10D
   1F1F 1A10             1F20 2268          DC    XL2'1A10'   10E
   1F21 1A10             1F22 2269          DC    XL2'1A10'   10F
   1F23 3607             1F24 2270          DC    XL2'3607'   110  BR, RETURN TO MAIN ROUTINE
   1F25 5111             1F26 2271 R12MC3   DC    XL2'5111'   111  ERROR, HANG
                         2272
                         2272
                         2273 ********************************************************************
                         2274 *      ROUTINE 15 - LR MICRO INSTRUCTION TEST                      *
                         2275 ********************************************************************
                         2276 *                                                                  *
                         2277 *      THIS ROUTINE CHECKS THE LR MICRO INSTRUCTION WITHIN THE     *
                         2278 *      HDB'S ONLY.  THE ABILITY TO LOAD FROM AND TO EXTERNALS      *
                         2279 *      WILL BE CHECKED LATER.                                      *
                         2280 ***     LR CK OF 1ST HDB ONLY                                       ***
                         2281 *                                                                  *
                         2282 ********************************************************************
                         2283
   1F27 15               1F27 2284 RT15     DC    XL1'15'          ROUTINE NUMBER
   1F28 00               1F28 2285          DC    XL1'00'          NO MANUAL INTERVENTION
   1F29 1FA4             1F2A 2286          DC    AL2(RT16)        ADDRESS OF NEXT ROUTINE
                         2287
                         1F2C 2288          USING R13K01,XR1
   1F28 C2 01 1F3C               2289       LA    R13K01,XR1       INITIALIZE XR1 FOR INDEXING
                                 2290
   1F2F 1C 05 5A38 19            2291       MVC   MICOP,RT13OP(6,XR1)  MOVE OP BEING TESTED TO
   1F34 C0 87 021A               2292       B     PRINT            PRINT ROUTINE HEADING
   1F38 01               1F38 2293          DC    XL1'01'
   1F39 19               1F39 2294          DC    IL1'25'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1F3A 5A46             1F3B 2295          DC    AL2(MICPRT)
                         2296
   1F3C C0 87 5918       2297 R13K01 B      LOADCS           .GO LOAD MICROPROGRAM
   1F40 83               1F40 2298          DC    XL1'83'    .DISABLE UPON ENTRY, FILL 2ND
                         2299 *                              FSQ WITH BCS,0 ON ADDRESS
   1F41 1F56             1F42 2300          DC    AL2(R13MCS)  .START OF MICRO CODE
   1F43 1FA3             1F44 2301          DC    AL2(R13MCE)  .END OF MICROCODE
                         2302
   1F45 C0 87 54FE       2303 B             DOMICR           .GO EXECUTE MICROPROGRAM
   1F49 52               1F49 2304          DC    XL1'52'    .ERROR HALT  -52-
   1F4A 5026             1F4B 2305          DC    XL2'5026'  .EXPECTED RESULT
                         2306
   1F4C C0 87 0216       2307               B     LINK       .GO TO NEXT ROUTINE
                         2308
   1F50 F1F54040D3D9     1F55 2309 RT13OP   DC    CL6'1S  LR'
                         2310
                         2311 *-----------------------------*
                         2312 * START OF MICROPROGRAM LISTING *
                         2313 *-----------------------------*
                         1F56 2314 R13MCS   EQU   *
   1F56 73AA             1F57 2315          DC    XL2'73AA'   00  IC, SET HDB 03 = AA
   1F58 7155             1F59 2316          DC    XL2'7155'   01  IC, SET HDB 01 = 55
   1F5A 2F03             1F58 2317          DC    XL2'2F03'   02  LR, SET HDB 0F = AA FROM HDB 03
   1F5C EFAA             1F5D 2318          DC    XL2'EFAA'   03  CI, CHECK THAT HDB 0F IS = AA
   1F5E 9C06             1F5F 2319          DC    XL2'9C06'   04  BOS,3 MUST BRANCH
   1F60 5005             1F61 2320          DC    XL2'5005'   05  ERROR, HANG
   1F62 2F01             1F63 2321          DC    XL2'2F01'   06  LR, SET HDB 0F = 55 FROM HDB 01
   1F64 EF55             1F65 2322          DC    XL2'EF55'   07  CI, CHECK THAT HDB 0F = 55
   1F66 9C0A             1F67 2323          DC    XL2'9C0A'   08  BOC,3 MUST BRANCH
   1F68 5009             1F69 2324          DC    XL2'5009'   09  ERROR, HANG
   1F6A 202F             1F68 2325          DC    XL2'202F'   0A  LR, SET HDB 10 = 55 FROM HDB 0F
   1F6C E3AA             1F6D 2326          DC    XL2'E3AA'   0B  CI, CHECK THAT HDB 03 DID NOT CHANGE
   1F6E 9C0E             1F6F 2327          DC    XL2'9C0E'   0C  BOC,3 MUST BRANCH
   1F70 500D             1F71 2328          DC    XL2'500D'   0D  ERROR, HANG
   1F72 75FF             1F73 2329          DC    XL2'75FF'   0E  IC, SET HDB 5 = FF
   1F74 2510             1F75 2330          DC    XL2'2510'   0F  LR, SET HDB 05 = 55 FROM HDB 10
   1F76 E555             1F77 2331          DC    XL2'E555'   10  CI, CHECK HDB 05 = 55
   1F78 9C13             1F79 2332          DC    XL2'9C13'   11  BOC,3 MUST BRANCH
   1F7A 5012             1F7B 2333          DC    XL2'5012'   12  ERROR, HANG
   1F7C 76FF             1F7D 2334          DC    XL2'76FF'   13  IC, SET HDB 06 = FF
   1F7E 2623             1F7F 2335          DC    XL2'2623'   14  LR, SET HDB 16 = AA FROM HDB 03
   1F80 E6FF             1F81 2336          DC    XL2'E6FF'   15  CI, CHECK THAT HDB 06 STILL IS FF
   1F82 9C18             1F83 2337          DC    XL2'9C18'   16  BOC,3 MUST BRANCH
   1F84 5017             1F85 2338          DC    XL2'5017'   17  ERROR, HANG
   1F86 2616             1F87 2339          DC    XL2'2616'   18  LR, SET HDB 06 = AA FROM HDB 16
   1F88 E6AA             1F89 2340          DC    XL2'E6AA'   19  CI, CHECK 06 = AA
   1F8A 9C1C             1F8B 2341          DC    XL2'9C1C'   1A  BOC,3 MUST BRANCH
   1F8C 501B             1F8D 2342          DC    XL2'501B'   1B  ERROR, HANG
   1F8E 2430             1F8F 2343          DC    XL2'2430'   1C  LR, SET HDB 14 = 55 FROM HDB 10
   1F90 2614             1F91 2344          DC    XL2'2614'   1D  LR, SET HDB 06 = 55 FROM HDB 14
   1F92 E655             1F93 2345          DC    XL2'E655'   1E  CI, CHECK THAT HDB 06 = 55
   1F94 9C21             1F95 2346          DC    XL2'9C21'   1F  BOC,3 MUST BRANCH
   1F96 5020             1F97 2347          DC    XL2'5020'   20  ERROR, HANG
   1F98 2436             1F99 2348          DC    XL2'2436'   21  LR, SET HDB 16 = AA FROM HDB 14
   1F9A 2616             1F9B 2349          DC    XL2'2616'   22  LR, SET HDB 06 = AA FROM HDB 16
   1F9C E6AA             1F9D 2350          DC    XL2'E6AA'   23  CI, CHECK THAT HDB 06 = AA
   1F9E 9C26             1F9F 2351          DC    XL2'9C26'   24  BOC,3 MUST BRANCH
   1FA0 5025             1FA1 2352          DC    XL2'5025'   25  ERROR, HANG
   1FA2 5026             1FA3 2353 R13MCE   DC    XL2'5026'   26  HANG, TEST COMPLETED
                         2354
                         2354
                         2355 ********************************************************************
                         2356 *      ROUTINE 16 - TSN MICRO INSTRUCTION TEST                     *
                         2357 ********************************************************************
                         2358 *                                                                  *
                         2359 *      THIS ROUTINE TESTS THE BASIC TSN'S WHICH ARE IN A KNOWN     *
                         2360 *      QUIESCENT STATE.  OTHER TSN'S WILL BE CHECKED LATER.        *
                         2361 *                                                                  *
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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2362 ********************************************************************************
                         2363
   1FA4 16               1FA4 2364 RT16   DC    XL1'16'                  ROUTINE NUMBER
   1FA5 00               1FA5 2365        DC    XL1'00'                  NO MANUAL INTERVENTION
   1FA6 1FE5             1FA7 2366        DC    AL2(RT17)                ADDRESS OF NEXT ROUTINE
                         2367
                         1FB9 2368        USING R14K01,XR1
   1FA8 C2 01 1FB9            2369        LA    R14K01,XR1               INITIALIZE XR1 FOR INDEXING
                              2370
   1FAC 1C 05 5A38 19         2371        MVC   MICOP,RT14OP(6,XR1)      MOVE OP BEING TESTED TO
   1FB1 C0 87 021A            2372        B     PRINT                    PRINT ROUTINE HEADING
   1FB5 01               1FB5 2373        DC    XL1'01'
   1FB6 19               1FB6 2374        DC    IL1'25'
   1FB7 5A46             1FB8 2375        DC    AL2(MICPRT)
                         2376
   1FB9 C0 87 5918           2377 R14K01 B     LOADCS                   .GO LOAD MICROPROGRAM
   1FBD 87               1FBD 2378        DC    XL1'87'                  .DISABLE UPON ENTRY, FILL 2ND
                         2379 *                                          & 3RD 256 WDS W/BOS,0 TO ADDR.
   1FBE 1FD3             1FBF 2380        DC    AL2(R14MCS)              .START OF MICRO CODE
   1FC0 1FE4             1FC1 2381        DC    AL2(R14MCE)              .END OF MICROCODE
                         2382
   1FC2 C0 87 54FE           2383        B     DOMICR                   .GO EXECUTE MICROCODE
   1FC6 54               1FC6 2384        DC    XL1'54'                  .ERROR HALT  -54-
   1FC7 5008             1FC8 2385        DC    XL2'5008'                .EXPECTED DATA
                         2386
   1FC9 C0 87 0216           2387        B     LINK                     .GO TO NEXT ROUTINE
                         2388
   1FCD F1F640E3E2D5     1FD2 2389 RT14OP DC    CL6'16 TSN'
                         2390
                         2391 *-------------------------------*
                         2392 * START OF MICROPROGRAM LISTING *
                         2393 *-------------------------------*
                         1FD3 2394 R14MCS EQU   *
   1FD3 40E1             1FD4 2395        DC    XL2'40E1'   00  TSN, MUST NOT BRANCH
   1FD5 41E2             1FD6 2396        DC    XL2'41E2'   01  TSN, MUST NOT BRANCH
   1FD7 48E3             1FD8 2397        DC    XL2'48E3'   02  TSN, MUST NOT BRANCH
   1FD9 48E4             1FDA 2398        DC    XL2'48E4'   03  TSN, MUST NOT BRANCH
   1FDB 4DE5             1FDC 2399        DC    XL2'4DE5'   04  TSN, MUST NOT BRANCH
   1FDD 4EE6             1FDE 2400        DC    XL2'4EE6'   05  TSN, MUST NOT BRANCH
   1FDF 4408             1FE0 2401        DC    XL2'4408'   06  TSN, MUST BRANCH
   1FE1 5007             1FE2 2402        DC    XL2'5007'   07  ERROR, HANG
   1FE3 5008             1FE4 2403 R14MCE DC    XL2'5008'   08  HANG, TEST COMPLETE
                         2404
                         2405 ********************************************************************************
                         2406 *       ROUTINE 17 - SSF/SSN MICRO INSTRUCTION TESTS                           *
                         2407 ********************************************************************************
                         2408 *                                                                              *
                         2409 *       THIS ROUTINE TESTS THE BASIC SSF AND SSN MICRO INSTRUCTIONS             *
                         2410 *       BY MANIPULATING BITS 2, 3 AND 13 OF THE I/O REG.  OTHER SSF            *
                         2411 *       AND SSN INSTRUCTIONS WILL BE TESTED LATER.                             *
                         2412 *                                                                              *
                         2413 ********************************************************************************
                         2414
   1FE5 17               1FE5 2415 RT17   DC    XL1'17'                  ROUTINE NUMBER
   1FE6 00               1FE6 2416        DC    XL1'00'                  NO MANUAL INTERVENTION
   1FE7 2042             1FE8 2417        DC    AL2(RT18)                ADDRESS OF NEXT ROUTINE
                         2418
                         1FF5 2419        USING R15K01,XR1
   1FE9 C2 01 1FF5            2420        LA    R15K01,XR1               INITIALIZE XR1 FOR INDEXING
                              2421
   1FED C0 87 021A            2422        B     PRINT                    PRINT ROUTINE HEADING
   1FF1 01               1FF1 2423        DC    XL1'01'
   1FF2 1D               1FF2 2424        DC    IL1'29'
   1FF3 2025             1FF4 2425        DC    AL2(RT15OP)
                         2426
   1FF5 C0 87 5918           2427 R15K01 B     LOADCS                   .GO LOAD MICROPROGRAM
   1FF9 83               1FF9 2428        DC    XL1'83'                  .DISABLE UPON ENTRY, FILL 2ND
```


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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2429 *                                          FSQ WITH BOS,0 ON ADDRESS
   1FFA 2026             1FFB 2430        DC    AL2(R15MCS)              .START OF MICRO CODE
   1FFC 2041             1FFD 2431        DC    AL2(R15MCE)              .END OF MICROCODE
                         2432
   1FFE C0 87 54FE           2433        B     DOMICR                   .GO EXECUTE MICRO PROGRAM
   2002 56               2002 2434        DC    XL1'56'                  .ERROR HALT  -56-
   2003 500D             2004 2435        DC    XL2'500D'                .EXPECTED DATA
                         2436
   2005 C0 87 0216           2437        B     LINK                     .GO TO NEXT ROUTINE
                         2438
   2009 D9D6E4E340F1F540 2025 2439 RT15OP DC    CL29'ROUT 17 SSF/SSN MICRO OP TEST'
   2011 E2E2C661E2E2D540     2439
   2019 D4C9C3D5D640D6D7     2439
   2021 40E3C5E2E3           2439
                         2440
                         2441 *-------------------------------*
                         2442 * START OF MICROPROGRAM LISTING *
                         2443 *-------------------------------*
                         2026 2444 R15MCS EQU   *
   2026 1008             2027 2445        DC    XL2'1008'   00  SSF, RESET BITS 2,3 AND 13 OF I/O REG
   2028 42E1             2029 2446        DC    XL2'42E1'   01  TSN, MUST NOT BRANCH
   202A 43E2             202B 2447        DC    XL2'43E2'   02  TSN, MUST NOT BRANCH
   202C 4AE3             202D 2448        DC    XL2'4AE3'   03  TSN, MUST NOT BRANCH
   202E 1204             202F 2449        DC    XL2'1204'   04  SSN, SET BIT 2 OF I/O REG ON
   2030 4207             2031 2450        DC    XL2'4207'   05  TSN, MUST BRANCH
   2032 5006             2033 2451        DC    XL2'5006'   06  ERROR, HANG
   2034 1304             2035 2452        DC    XL2'1304'   07  SSN, SET BIT 3 OF I/O REG ON
   2036 430A             2037 2453        DC    XL2'430A'   08  TSN, MUST BRANCH
   2038 5009             2039 2454        DC    XL2'5009'   09  ERROR, HANG
   203A 1008             203B 2455        DC    XL2'1008'   0A  SSF, RESET BITS 2,3 AND 13 OF I/O REG
   203C 42E4             203D 2456        DC    XL2'42E4'   0B  TSN, MUST NOT BRANCH
   203E 43E5             203F 2457        DC    XL2'43E5'   0C  TSN, MUST NOT BRANCH
   2040 500D             2041 2458 R15MCE DC    XL2'500D'   0D  HANG, END OF TEST
                         2459
                         2459
                         2460 ********************************************************************************
                         2461 * ROUTINE 18, BAL OP                                                           *
                         2462 ********************************************************************************
   2042 18               2042 2463 RT18   DC    XL1'18'                  ROUTINE NUMBER
   2043 00               2043 2464        DC    XL1'00'                  NO MANUAL INTERVENTION
   2044 2152             2045 2465        DC    AL2(RT19)                ADDRESS OF NEXT ROUTINE
                         2466 *
   2046 C0 87 021A           2467        B     PRINT                    PRINT ROUTINE HEADING
   204A 01               204A 2468        DC    XL1'01'
   204B 27               204B 2469        DC    IL1'39'
   204C 2078             204D 2470        DC    AL2(R34HDR)
   204E C0 87 2079           2471        B     RT34GO
   2052 D9D6E4E340F1F840 2078 2472 R34HDR DC    CL39'ROUT 18 BAL MICRO OP TEST: 1K ADDRESSES'
   205A C2C1D340D4C9C3D9     2472
   2062 D640D6D740E3C5E2     2472
   206A E35E40F1D240C1C4     2472
   2072 C4D9C5E2E2C5E2       2472
   2079 C0 87 5918           2473 RT34GO B     LOADCS                   GO LOAD MICROCODE IN 1ST FSQ.
   207D 91               207D 2474        DC    XL1'91'
   207E 20A8             207F 2475        DC    AL2(R34MCS)              STARTING ADDRESS
   2080 20E5             2081 2476        DC    AL2(R34MCE)              END ADDRESS
   2082 C0 87 5918           2477        B     LOADCS                   GO LOAD MICROCODE IN 2ND FSQ.
   2086 B2               2086 2478        DC    XL1'B2'
   2087 20E6             2088 2479        DC    AL2(R34MC1)              ADDR OF 1ST WORD
   2089 20EF             208A 2480        DC    AL2(R34MC2)              ADDR OF LAST WORD.
   208B C0 87 5918           2481        B     LOADCS                   GO LOAD MICROCODE
   208F B4               208F 2482        DC    XL1'B4'                   ADDRESSES 200-2FF
   2090 20F0             2091 2483        DC    AL2(R34MC3)
   2092 2118             2093 2484        DC    AL2(R34MC4)
   2094 C0 87 5918           2485        B     LOADCS                   GO LOAD MICROCODE
   2098 A8               2098 2486        DC    XL1'A8'                   ADDRESSES 300-3FF
   2099 211C             209A 2487        DC    AL2(R34MC5)
   209B 2151             209C 2488        DC    AL2(R34MC6)
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8912 DISPLAY ADAPTER TEST

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ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

   209D C0 87 54FE           2489          B     DOMICR                    GO DO MICROCODE
   20A1 34             20A1  2490          DC    XL1'34'                   ERROR HALT -34-
   20A2 5215           20A3  2491          DC    XL2'5215'                 EXPECTED RESULTS
   20A4 C0 87 0216           2492          B     LINK                      EXIT ROUTINE
                             2493 *-------------------------------*
                             2494 * START OF MICROPROGRAM LISTING *
                             2495 *-------------------------------*
                       20A8  2496 R34MCS   EQU   *
   20A8 7101           20A9  2497          DC    XL2'7101'   000   IC 1,X'01'
   20AA D003           20AB  2498          DC    XL2'D003'   001   BAL TO ADDRESS 003
   20AC 5002           20AD  2499          DC    XL2'5002'   002   BOS,0       ERROR, HANG
   20AE B15F           20AF  2500          DC    XL2'B15F'   003   CIR 01,3F
   20B0 9C06           20B1  2501          DC    XL2'9C06'   004   BOC,3       TO ADDR 006
   20B2 5005           20B3  2502          DC    XL2'5005'   005   BOS,0       ERROR, HANG
   20B4 D008           20B5  2503          DC    XL2'D008'   006   BAL TO ADDRESS 008
   20B6 5007           20B7  2504          DC    XL2'5007'   007   BOS,0       ERROR, HANG
   20B8 7606           20B9  2505          DC    XL2'7606'   008   IC 6,X'06'
   20BA B65F           20BB  2506          DC    XL2'B65F'   009   CIR 06,3F
   20BC 9C0C           20BD  2507          DC    XL2'9C0C'   00A   BOC,3       TO ADDR 00C
   20BE 5008           20BF  2508          DC    XL2'5008'   00B   BOS,0       ERROR, HANG
   20C0 2EA1           20C1  2509          DC    XL2'2EA1'   00C   LR 3E,01
   20C2 D00F           20C3  2510          DC    XL2'D00F'   00D   BAL TO ADDRESS 00F
   20C4 500E           20C5  2511          DC    XL2'500E'   00E   BOS,0       ERROR, HANG
   20C6 B15E           20C7  2512          DC    XL2'B15E'   00F   CIR 01,3E
   20C8 9012           20C9  2513          DC    XL2'9012'   010   BOC,0       TO ADDR 012
   20CA 5011           20CB  2514          DC    XL2'5011'   011   BOS,0       ERROR, HANG
   20CC 7000           20CD  2515          DC    XL2'7000'   012   IC 0,X'00'
   20CE B05E           20CF  2516          DC    XL2'B05E'   013   CIR 00,3E
   20D0 9C16           20D1  2517          DC    XL2'9C16'   014   BOC,3       TO ADDR 016
   20D2 5015           20D3  2518          DC    XL2'5015'   015   BOS,0       ERROR, HANG
   20D4 D100           20D5  2519          DC    XL2'D100'   016   BAL TO ADDRESS 100
   20D6 5017           20D7  2520          DC    XL2'5017'   017   BOS,0       ERROR, HANG
   20D8 B10C           20D9  2521          DC    XL2'B10C'   018   CIR 01,0C
   20DA 9C1B           20DB  2522          DC    XL2'9C1B'   019   BOC,3       TO ADDR 01B
   20DC 501A           20DD  2523          DC    XL2'501A'   01A   BOS,0       ERROR, HANG
   20DE B05F           20DF  2524          DC    XL2'B05F'   01B   CIR 00,3F
   20E0 9C1E           20E1  2525          DC    XL2'9C1E'   01C   BOC,3       TO ADDR 01E
   20E2 501D           20E3  2526          DC    XL2'501D'   01D   BOS,0       ERROR, HANG
   20E4 D20F           20E5  2527 R34MCE   DC    XL2'D20F'   01E   BAL TO ADDR 210
                       20E6  2528 R34MC1   EQU   *
   20E6 D102           20E7  2529          DC    XL2'D102'   100   BAL TO ADDRESS 102,
   20E8 5101           20E9  2530          DC    XL2'5101'   101   BOS,0       ERROR, HANG
   20EA 2C5E           20EB  2531          DC    XL2'2C5E'   102   LR HDB 3E TO HDB 0C
   20EC CCF0           20ED  2532          DC    XL2'CCF0'   103   SBF, 0C, X'F0'
   20EE 5018           20EF  2533 R34MC2   DC    XL2'5018'   104   BOS,0       TO ADDRESS 018
                       20F0  2534 R34MC3   EQU   *
   20F0 5200           20F1  2535          DC    XL2'5200'   200   BOS,0       ERROR,HANG
   20F2 5201           20F3  2536          DC    XL2'5201'   201   BOS,0       ERROR,HANG
   20F4 5202           20F5  2537          DC    XL2'5202'   202   BOS,0       ERROR,HANG
   20F6 5203           20F7  2538          DC    XL2'5203'   203   BOS,0       ERROR,HANG
   20F8 5204           20F9  2539          DC    XL2'5204'   204   BOS,0       ERROR,HANG
   20FA 5205           20FB  2540          DC    XL2'5205'   205   BOS,0       ERROR,HANG
   20FC 5206           20FD  2541          DC    XL2'5206'   206   BOS,0       ERROR,HANG
   20FE 5207           20FF  2542          DC    XL2'5207'   207   BOS,0       ERROR,HANG
   2100 5208           2101  2543          DC    XL2'5208'   208   BOS,0       ERROR,HANG
   2102 5209           2103  2544          DC    XL2'5209'   209   BOS,0       ERROR,HANG
   2104 520A           2105  2545          DC    XL2'520A'   20A   BOS,0       ERROR,HANG
   2106 520B           2107  2546          DC    XL2'520B'   20B   BOS,0       ERROR,HANG
   2108 520C           2109  2547          DC    XL2'520C'   20C   BOS,0       ERROR,HANG
   210A 520D           210B  2548          DC    XL2'520D'   20D   BOS,0       ERROR,HANG
   210C 520E           210D  2549          DC    XL2'520E'   20E   BOS,0       ERROR,HANG
   210E D311           210F  2550          DC    XL2'D311'   20F   BAL TO ADDRESS 311
   2110 5210           2111  2551          DC    XL2'5210'   210   BOS,0       ERROR,HANG
   2112 7313           2113  2552          DC    XL2'7313'   211   IS HDB 03=13
   2114 B35E           2115  2553          DC    XL2'B35E'   212   CIR 03,3E
   2116 9E15           2117  2554          DC    XL2'9E15'   213   BOC,3 TO ADDR 215
   2118 5214           2119  2555          DC    XL2'5214'   214   BOS,0       ERROR, HANG
   211A 5215           2118  2556 R34MC4   DC    XL2'5215'   215   BOS,0  EXPECTED RESULTS
```


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```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

                       211C  2557 R34MC5   EQU   *
   211C 5300           211D  2558          DC    XL2'5300'   300   BOS,0       ERROR, HANG
   211E 5301           211F  2559          DC    XL2'5301'   300   BOS,0       ERROR, HANG
   2120 5302           2121  2560          DC    XL2'5302'   302   BOS,0       ERROR, HANG
   2122 5303           2123  2561          DC    XL2'5303'   303   BOS,0       ERROR, HANG
   2124 5304           2125  2562          DC    XL2'5304'   304   BOS,0       ERROR, HANG
   2126 5305           2127  2563          DC    XL2'5305'   305   BOS,0       ERROR, HANG
   2128 5306           2129  2564          DC    XL2'5306'   306   BOS,0       ERROR, HANG
   212A 5307           212B  2565          DC    XL2'5307'   307   BOS,0       ERROR, HANG
   212C 5308           212D  2566          DC    XL2'5308'   308   BOS,0       ERROR, HANG
   212E 5309           212F  2567          DC    XL2'5309'   309   BOS,0       ERROR, HANG
   2130 530A           2131  2568          DC    XL2'530A'   30A   BOS,0       ERROR, HANG
   2132 530B           2133  2569          DC    XL2'530B'   30B   BOS,0       ERROR, HANG
   2134 530C           2135  2570          DC    XL2'530C'   30C   BOS,0       ERROR, HANG
   2136 530D           2137  2571          DC    XL2'530D'   30D   BOS,0       ERROR, HANG
   2138 530E           2139  2572          DC    XL2'530E'   30E   BOS,0       ERROR, HANG
   213A 530F           213B  2573          DC    XL2'530F'   30F   BOS,0       ERROR, HANG
   213C 5310           213D  2574          DC    XL2'5310'   310   BOS,0       ERROR, HANG
   213E 700F           213F  2575          DC    XL2'700F'   311   IC 0,X'0F'
   2140 B05F           2141  2576          DC    XL2'B05F'   312   CIR 00,3F
   2142 9F15           2143  2577          DC    XL2'9F15'   313   BOC,3 TO ADDRESS 315
   2144 5314           2145  2578          DC    XL2'5314'   314   BOS,0       ERROR, HANG
   2146 7012           2147  2579          DC    XL2'7012'   315   IC 0,X'12'
   2148 905F           2149  2580          DC    XL2'905F'   316   CIR 00,3E
   214A 9F19           214B  2581          DC    XL2'9F19'   317   BOC,3 TO ADDRESS 319
   214C 5318           214D  2582          DC    XL2'5318'   318   BOS,0       ERROR, HANG
   214E D211           214F  2583          DC    XL2'D211'   319   BAL TO ADDRESS 211
   2150 531A           2151  2584 R34MC6   DC    XL2'531A'   31A   BOS,0       ERROR, HANG
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2586 ********************************************************************************
                         2587 * ROUTINE 19 CHECK FOR INTERFERENCE BETWEEN LE OP AND LR OP.                  *
                         2588 ********************************************************************************
  2152 19                2152 2589 RT19   DC    XL1'19'                  ROUTINE NUMBER
  2153 00                2153 2590        DC    XL1'00'                  NO MANUAL INTERVENTION
  2154 2228              2155 2591        DC    AL2(RT1A)                ADDR OF NEXT ROUTINE
                         2592
  2156 C0 87 021A              2593        B     PRINT                    PRINT ROUTINE HEADING
  215A 01                215A 2594        DC    XL1'01'
  215B 14                215B 2595        DC    IL1'20'
  215C 2175              215D 2596        DC    AL2(R3AHDR)
  215E C0 87 2176              2597        B     R3AGO
  2162 D9D6E4E340F1F948  2175 2598 R3AHDR DC    CL20'ROUT 19. LE OP/LR OP'
  216A 40D3C540D6D76 1D3       2598
  2172 D940D6D7                2598
  2176 C0 87 5918              2599 R3AGO  B     LOADCS                   LOAD MICROCODE
  217A 83                217A 2600        DC    XL1'83'
  217B 218A              217C 2601        DC    AL2(R3AMCS)               START ADDR
  217D 21DF              217E 2602        DC    AL2(R3AMCE)               END ADDR
  217F C0 87 54FE              2603        B     DOMICR                   DO MICROCODE
  2183 3A                2183 2604        DC    XL1'3A'                   ERROR HALT
  2184 502A              2185 2605        DC    XL2'502A'                 EXPECTED RESULTS
  2186 C0 87 21E0              2606        B     RT3AP2                   BR TO PART 2
                               2607
                               2608 *-----------------------------*
                               2609 * START OF MICROPROGRAM LISTING *
                               2610 *-----------------------------*
                         218A 2611 R3AMCS EQU   *
  218A 7605              2188 2612        DC    XL2'7605'   000   IC 06,X'05'
  218C 7715              218D 2613        DC    XL2'7715'   001   IC 07,X'15'
  218E 7825              218F 2614        DC    XL2'7825'   002   IC 08,X'25'
  2190 7935              2191 2615        DC    XL2'7935'   003   IC 09,X'35'
  2192 7002              2193 2616        DC    XL2'7002'   004   IC 00,X'02'
  2194 7100              2195 2617        DC    XL2'7100'   005   IC 01,X'00'
  2196 7C22              2197 2618        DC    XL2'7C22'   006   IC 0C,X'22'
  2198 2506              2199 2619        DC    XL2'2506'   007   LR 05,06
  219A 2527              219B 2620        DC    XL2'2527'   008   LR 15,07
  219C 2588              219D 2621        DC    XL2'2588'   009   LR 25,08
  219E 25A9              219F 2622        DC    XL2'25A9'   00A   LR 35,09
  21A0 058C              21A1 2623        DC    XL2'058C'   00B   LE 25,0C
  21A2 8506              21A3 2624        DC    XL2'8506'   00C   CIR 05,06
  21A4 900D              21A5 2625        DC    XL2'900D'   00D   BOC 0,SELF
  21A6 8527              21A7 2626        DC    XL2'8527'   00E   CIR 15,07
  21A8 900F              21A9 2627        DC    XL2'900F'   00F   BOC 0,SELF
  21AA 8588              21AB 2628        DC    XL2'8588'   010   CIR 25,08
  21AC 9011              21AD 2629        DC    XL2'9011'   011   BOC 0,SELF
  21AE 85A9              21AF 2630        DC    XL2'85A9'   012   CIR 35,09
  21B0 9013              21B1 2631        DC    XL2'9013'   013   BOC 0,SELF
  21B2 0D45              21B3 2632        DC    XL2'0D45'   014   LE 0D,25
  21B4 8D0C              21B5 2633        DC    XL2'8D0C'   015   CIR 0D,0C
  21B6 9016              21B7 2634        DC    XL2'9016'   016   BOC 0,SELF
  21B8 7650              21B9 2635        DC    XL2'7650'   017   IC  05,X'50'
  21BA 7751              21BB 2636        DC    XL2'7751'   018   IC  07,X'51'
  21BC 7852              21BD 2637        DC    XL2'7852'   019   IC  08,X'52'
  21BE 7953              21BF 2638        DC    XL2'7953'   01A   IC  09,X'53'
  21C0 25A9              21C1 2639        DC    XL2'25A9'   01B   LR  35,09
  21C2 2588              21C3 2640        DC    XL2'2588'   01C   LR  25,08
  21C4 2527              21C5 2641        DC    XL2'2527'   01D   LR  15,07
  21C6 2506              21C7 2642        DC    XL2'2506'   01E   LR  05,06
  21C8 0E45              21C9 2643        DC    XL2'0E45'   01F   LE  0E,25
  21CA BE0C              21CB 2644        DC    XL2'BE0C'   020   CIR 0E,0C
  21CC 9021              21CD 2645        DC    XL2'9021'   021   BOC 0,SELF
  21CE 8506              21CF 2646        DC    XL2'8506'   022   CIR 05,06
  21D0 9023              21D1 2647        DC    XL2'9023'   023   BOC 0,SELF
  21D2 8527              21D3 2648        DC    XL2'8527'   024   CIR 15,07
  21D4 9025              21D5 2649        DC    XL2'9025'   025   BOC 0,SELF
  21D6 8588              21D7 2650        DC    XL2'8588'   026   CIR 25,08
  21D8 9027              21D9 2651        DC    XL2'9027'   027   BOC 0,SELF
```

```
MBAR =02XX
MBAR =0200
HDB 0C SET TO 22
HDB 05 SET TO 05
HDB 15 SET TO 15
HDB 25 SET TO 25
HDB 35 SET TO 35
WRITE MSG BFR FROM 0C
HDB 05 STILL=05
ERROR, HANG IF NOT
HDB 15 STILL=15?
ERROR, HANG IF NOT
HDB 25 STILL=25?
ERROR, HANG IF NOT
HDB 35 STILL=35?
ERROR, HANG IF NOT
READ MSG BFR TO 0D
MB (ADDR 0200)=22?
ERROR, HANG IF NOT
HDB 06 SET TO 50
HDB 07 SET TO 51
HDB 08 SET TO 52
HDB 09 SET TO 53
HDB 35 SET TO 53
HDB 25 SET TO 52
HDB 15 SET TO 51
HDB 05 SET TO 50
RD MSG BFR TO HDB 0E
MSG BFR STILL 22?
ERROR, HANG IF NOT
HDB 05=50?
ERROR, HANG IF NOT
HDB 15=51?
ERROR, HANG IF NOT
HDB 25=52?
ERROR, HANG IF NOT
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  21DA 85A9              21DB 2652        DC    XL2'85A9'   028   CIR 35,09          HDB 35=53?
  21DC 9029              21DD 2653        DC    XL2'9029'   029   BOC 0,SELF         ERROR, HANG IF NOT
  21DE 502A              21DF 2654 R3AMCE DC    XL2'502A'   02A   BOS 0,SELF         EXPECTED RESULTS
                               2655
                               2656 * BEGIN PART 2 OF ROUTINE
  21E0 F3 58 80                2657 RT3AP2 SIO   X'80',SIOI                DISABLE RESET
  21E3 31 48 0D56              2658        LIO   XAA55,HDB0                LIO TO HDB 00/01 AND 20/21
  21E7 F3 58 C0                2659        SIO   X'C0',SIOI                ENABLE ATTACHMENT
  21EA 31 48 0D59              2660        LIO   XFFFF,HDE0                LIO TO HDB 10/11 AND 30/31.
  21EE C0 87 5918              2661        B     LOADCS                    LOAD MICROCODE
  21F2 83                21F2 2662        DC    XL1'83'
  21F3 2202              21F4 2663        DC    AL2(R3AMC1)
  21F5 2227              21F6 2664        DC    AL2(R3AMC2)
  21F7 C0 87 54FE              2665        B     DOMICR                    GO DO MICROPROGRAM
  21FB 3C                21FB 2666        DC    XL1'3C'                   ERROR HALT 3C
  21FC 5012              21FD 2667        DC    XL2'5012'                 EXPECTED RESULTS
  21FE C0 87 0216              2668        B     LINK
                               2669
                               2670 *-----------------------------*
                               2671 * START OF MICROPROGRAM LISTING *
                               2672 *-----------------------------*
                         2202 2673 R3AMC1 EQU   *
  2202 E0AA              2203 2674        DC    XL2'E0AA'   000   CI  00,X'AA'
  2204 9C03              2205 2675        DC    XL2'9C03'   001   BOC,3 TO ADR 003, BR IF EQUAL
  2206 5002              2207 2676        DC    XL2'5002'   002   BOS,0 ERROR HANG
  2208 E155              2209 2677        DC    XL2'E155'   003   CI  01,X'55'
  220A 9C06              220B 2678        DC    XL2'9C06'   004   BOC,3 TO ADR 006, BR IF EQUAL
  220C 5005              220D 2679        DC    XL2'5005'   005   BOS,0 ERROR, HANG
  220E B040              220F 2680        DC    XL2'B040'   006   CIR 00,20
  2210 9C09              2211 2681        DC    XL2'9C09'   007   BOC,3 TO ADR 009, BR IF EQUAL
  2212 5008              2213 2682        DC    XL2'5008'   008   BOS,0 ERROR, HANG
  2214 B141              2215 2683        DC    XL2'B141'   009   CIR 01,21
  2216 9C0C              2217 2684        DC    XL2'9C0C'   00A   BOC,3 TO ADR 00C, BR IF EQUAL
  2218 5008              2219 2685        DC    XL2'5008'   00B   BOS,0 ERROR, HANG
  221A B070              221B 2686        DC    XL2'B070'   00C   CIR 10,30
  221C 9C0F              221D 2687        DC    XL2'9C0F'   00D   BOC,3 TO ADR 00F, BR IF EQUAL
  221E 500E              221F 2688        DC    XL2'500E'   00E   BOS,0 ERROR, HANG
  2220 B171              2221 2689        DC    XL2'B171'   00F   CIR 11,31
  2222 9C12              2223 2690        DC    XL2'9C12'   010   BOC,3 TO ADR 012, BR IF EQUAL
  2224 5011              2225 2691        DC    XL2'5011'   011   BOS,0 ERROR, HANG
  2226 5012              2227 2692 R3AMC2 DC    XL2'5012'   012   BOS,0 EXPECTED RESULTS
                               2693 ********************************************************************************
                               2694 * ROUTINE 1A. ADDRESSING ABOVE 1K                                            *
                               2695 *                                                                             *
                               2696 * PART 1.  IF THE 2ND 2K FET STORAGE CARD IS PRESENT,                        *
                               2697 *          MICROCODE IS LOADED INTO IT. ADDRESS 000                           *
                               2698 *          BALS TO IT.                                                        *
                               2699 *                                                                             *
                               2700 * PART 2.  IF THE 3RD 2K FET STORAGE CARD IS PRESENT,                        *
                               2701 *          MICROCODE IS LOADED INTO IT AND ADDRESS 000                        *
                               2702 *          BAL'S TO IT.                                                       *
                               2703 *                                                                             *
                               2704 ********************************************************************************
  2228 1A                2228 2705 RT1A   DC    XL1'1A'                  ROUTINE NUMBER
  2229 00                2229 2706        DC    XL1'00'
  222A 22F1              222B 2707        DC    AL2(RT1B)                ADDR OF NEXT ROUTINE
  222C C0 87 021A              2708        B     PRINT                    PRINT ROUTINE HEADER
  2230 01                2230 2709        DC    XL1'01'
  2231 18                2231 2710        DC    IL1'27'
  2232 2252              2233 2711        DC    AL2(R40HDR)
  2234 C0 87 2253              2712        B     R40GO
  2238 D9D6E4E340F1C140  2252 2713 R40HDR DC    CL27'ROUT 1A ADDRESSING ABOVE 1K'
  2240 C1C4C4D9C5E2E2C9        2713
  2248 D5C740C1C2D6E3C5        2713
  2250 40F1D2                  2713
  2253 C0 87 5918              2714 R40GO  B     LOADCS
  2257 9F                2257 2715        DC    XL1'9F'                  IN 1ST FET STORAGE & FILL WITH
  2258 227D              2259 2716        DC    AL2(R40NCS)              BOS-TO-ADDRESS
```

8912 DISPLAY ADAPTER TEST

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ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

   225A 228A            225B 2717         DC    AL2(R40MCE)
                             2718
   225C C0 87 5918           2719         B     LOADCS                  GO LOAD MICROCODE IN 2ND FET
   2260 EF              2260 2720         DC    XL1'EF'                 STORAGE AND FILL WITH
   2261 228B            2262 2721         DC    AL2(R40MC1)             BOS-TO-ADDRESS
   2263 2296            2264 2722         DC    AL2(R40MC2)
   2265 20              2265 2723         DC    XL1'20'
   2266 3C FF 5564           2724         MVI   LPCNT,X'FF'             EXTEND LOOP COUNT
   226A C0 87 54FE           2725         B     DOMICR                  BR TO DO MICROCODE
   226E 60              226E 2726         DC    XL1'60'                  ERROR HALT 60
   226F 5005            2270 2727         DC    XL2'5005'                EXPECTED RESULTS
   2271 38 02 0A0C           2728         TBN   UDT2,X'02'              TEST FOR 3RD FET INSTALLED
   2275 C0 90 0216           2729         BF    LINK                    EXIT IF NOT
   2279 C0 87 2297           2730         B     R40PT2
                             2731 *-------------------------------*
                             2732 * START OF MICROPROGRAM LISTING *
                             2733 *-------------------------------*
                        227D 2734 R40MCS EQU   *
   227D 0400            227E 2735         DC    XL2'D400'    000  BAL     TO ADDRESS 0400.
   227F D001            2280 2736         DC    XL2'D001'    001  BAL     ERROR. HANG
   2281 D002            2282 2737         DC    XL2'D002'    002  BAL     ERROR. HANG
   2283 D003            2284 2738         DC    XL2'D003'    003  BAL     ERROR. HANG
   2285 D004            2286 2739         DC    XL2'D004'    004  BAL     ERROR. HANG
   2287 D005            2288 2740         DC    XL2'D005'    005  BAL     ERROR. HANG
   2289 D006            228A 2741 R40MCE  DC    XL2'D006'    006  BAL     ERROR. HANG
                        228B 2742 R40MC1  EQU   *
   228B 77FF            228C 2743         DC    XL2'77FF'    400  IC.7=FF IC HDB 7=FF
   228D 77FE            228E 2744         DC    XL2'77FE'    401  IC.7=FE IC HDB 7=FE
   228F 5004            2290 2745         DC    XL2'5004'    402  BOS.0   TO ADDR 404
   2291 5003            2292 2746         DC    XL2'5003'    403  BOS.0   ERROR. HANG
   2293 77FD            2294 2747         DC    XL2'77FD'    404  IC.7=FD IC HDB 7=FD
   2295 5005            2296 2748 R40MC2  DC    XL2'5005'    405  BOS.0   EXPECTED RESULTS
                             2749 * BEGIN PART TWO
   2297 C0 87 5918           2750 R40PT2 B     LOADCS                  GO LOAD MICROCODE IN 1ST
   229B 9F              229B 2751         DC    XL1'9F'                 FET STORAGE AND FILL WITH
   229C 22C3            229D 2752         DC    AL2(R40MC3)             BOS-TO-ADDRESS
   229E 22D2            229F 2753         DC    AL2(R40MC4)
                             2754
   22A0 C0 87 5918           2755         B     LOADCS                  GO LOAD MICROCODE IN 2ND
   22A4 FF              22A4 2756         DC    XL1'FF'                 FET STORAGE AND FILL WITH
   22A5 22D3            22A6 2757         DC    AL2(R40MC5)             BOS TO ADDRESS
   22A7 22E2            22A8 2758         DC    AL2(R40MC6)
   22A9 20              22A9 2759         DC    XL1'20'
   22AA C0 87 5918           2760         B     LOADCS                  GO LOAD MICROCODE IN 3RD
   22AE FF              22AE 2761         DC    XL1'FF'                 FET STORAGE AND FILL WITH
   22AF 22E3            22B0 2762         DC    AL2(R40MC7)             BOS TO ADDRESS
   22B1 22F0            22B2 2763         DC    AL2(R40MC8)
   22B3 40              22B3 2764         DC    XL1'40'
   22B4 3C FF 5564           2765         MVI   LPCNT,X'FF'             EXTEND LOOP COUNT
   22B8 C0 87 54FE           2766         B     DOMICR                  BR TO DO MICROCODE
   22BC 61              22BC 2767         DC    XL1'61'                  ERROR HALT 61
   22BD 5006            22BE 2768         DC    XL2'5006'                EXPECTED RESULTS
   22BF C0 87 0216           2769         B     LINK
                             2770
                             2771 *-------------------------------*
                             2772 * START OF MICROPROGRAM LISTING *
                             2773 *-------------------------------*
                        22C3 2774 R40MC3 EQU   *
   22C3 D800            22C4 2775         DC    XL2'D800'    000  BAL     TO ADDR 800
   22C5 D001            22C6 2776         DC    XL2'D001'      1  BAL     ERROR. HANG
   22C7 D002            22C8 2777         DC    XL2'D002'      2  BAL     ERROR. HANG
   22C9 D003            22CA 2778         DC    XL2'D003'      3  BAL     ERROR. HANG
   22CB D004            22CC 2779         DC    XL2'D004'      4  BAL     ERROR. HANG
   22CD D005            22CE 2780         DC    XL2'D005'      5  BAL     ERROR. HANG
   22CF D006            22D0 2781         DC    XL2'D006'      6  BAL     ERROR. HANG
   22D1 D007            22D2 2782 R40MC4  DC    XL2'D007'      7  BAL     ERROR. HANG
                             2783
                        22D3 2784 R40MC5  EQU   *
```


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```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

   22D3 4C00            22D4 2785         DC    XL2'4C00'    400  TSN.C   ERROR. HANG
   22D5 4C01            22D6 2786         DC    XL2'4C01'    401  TSN.C   ERROR. HANG
   22D7 4C02            22D8 2787         DC    XL2'4C02'    402  TSN.C   ERROR. HANG
   22D9 4C03            22DA 2788         DC    XL2'4C03'    403  TSN.C   ERROR. HANG
   22DB 4C04            22DC 2789         DC    XL2'4C04'    404  TSN.C   ERROR. HANG
   22DD 4C05            22DE 2790         DC    XL2'4C05'    405  TSN.C   ERROR. HANG
   22DF 4C06            22E0 2791         DC    XL2'4C06'    406  TSN.C   ERROR. HANG
   22E1 4C07            22E2 2792 R40MC6  DC    XL2'4C07'    407  BOS.C   ERROR. HANG
                             2793
                        22E3 2794 R40MC7  EQU   *
   22E3 7600            22E4 2795         DC    XL2'7600'    800  IC 6=00 IC HDB 6=00
   22E5 5003            22E6 2796         DC    XL2'5003'    801  BOS.0   TO ADDR 803
   22E7 5002            22E8 2797         DC    XL2'5002'    802  BOS.0   ERROR. HANG
   22E9 1610            22EA 2798         DC    XL2'1610'    803  INC.6   INCREMENT HDB 6
   22EB D806            22EC 2799         DC    XL2'D806'    804  BAL     TO ADDR 806
   22ED 5005            22EE 2800         DC    XL2'5005'    805  BOS.0   ERROR. HANG
   22EF 5006            22F0 2801 R40MC8  DC    XL2'5006'    806  BOS.0   EXPECTED RESULTS
                             2802
                             2803 ************************************************************
                             2804 * ROUTINE 18. BRANCH REGISTER TO ALL ADDRESSES WITH BAL BACK-TO 000  *
                             2805 *                                                          *
                             2806 * THIS ROUTINE LOADS ALL OF CONTROL STORAGE WITH MICRO-OP 'D000'      *
                             2807 * WHICH IS A BAL TO ADDRESS 000.                          *
                             2808 *                                                          *
                             2809 * THE FIRST 26 WORDS ARE THEN OVERLAYED WITH A MICROPROGRAM.          *
                             2810 * THIS MICRO-PROGRAM DOES A BRANCH REGISTER TO EACH ADDRESS IN       *
                             2811 * CONTROL STORE. AFTER THE BAL RETURN, THE LINK INFORMATION          *
                             2812 * IN HDB'S 3E AND 3F IS CHECKED.                          *
                             2813 *                                                          *
                             2814 * THE ADDRESS OF THE FIRST WORD TO BE BRANCHED TO IS PROVIDED          *
                             2815 * BY L10 TO HDB'S 16,17                                   *
                             2816 *                                                          *
                             2817 * A FLAG BYTE MUST BE PROVIDED BY L10 TO HDB 19.          *
                             2818 *       BIT 6= 1   IF THIRD FET INSTALLED.                 *
                             2819 *       BIT 7= 1   IF SECOND FET INSTALLED.                *
                             2820 *                                                          *
                             2821 ************************************************************
   22F1 18              22F1 2822 RT18    DC    XL1'18'                 ROUTINE NUMBER
   22F2 00              22F2 2823         DC    XL1'00'
   22F3 2480            22F4 2824         DC    AL2(RT1C)
                             2825
   22F5 C0 87 021A           2826         B     PRINT                   PRINT ROUTINE HEADER
   22F9 01              22F9 2827         DC    XL1'01'
   22FA 25              22FA 2828         DC    IL1'37'
   22FB 2325            22FC 2829         DC    AL2(R41HDR)
   22FD C0 87 2326           2830         B     RT41GO
   2301 D9D6E4E340F1C240 2325 2831 R41HDR  DC    CL37'ROUT 18 BR AND BAL OPS; ALL ADDRESSES'
   2309 C2D940C1D5C44CC2     2831
   2311 C1D340D6D7E25E40     2831
   2319 C1D3D340C1C4C4D9     2831
   2321 C5E2E2C5E2           2831
   2326 0C 01 248A 0D62      2832 RT41GO MVC   R41CTR(2),ZERO            ZERO OUT COUNTER
   232C F3 58 80             2833         SIO   X'80',SIOI              DISABLE RESET
   232F F3 58 C0             2834         SIO   X'C0',SIOI              ENABLE ATTACHMENT
   2332 31 58 248C           2835 R41LCS LIO   XD000,CTSTOR            L10 TO CTL STOR
   2336 0E 01 248A 5ACB      2836         ALC   R41CTR(2),WUN           INC COUNTER
   233C 00 01 248A 2DC0      2837         CLC   R41CTR(2),X0C00         COUNTER TO END OF CTL ST?
   2342 C0 01 2332           2838         BNE   R41LCS                  LOOP BACK IF NOT.
   2346 C0 87 5918           2839         B     LOADCS                  GO LOAD MICROCODE
   234A 80              234A 2840         DC    XL1'80'                  DON'T FILL WITH
   234B 23E6            234C 2841         DC    AL2(R41MCS)              BOS-TO-ADDR
   234D 2423            234E 2842         DC    AL2(R41MCE)
   234F F3 58 C0             2843         SIO   X'C0',SIOI              ENABLE ATTACHMENT
   2352 31 48 2425           2844         LIO   R41FRS,HDB3             FIRST ADDR TO HDB'S 16,17
   2356 0C 01 2427 0D62      2845         MVC   R41FLG(2),ZERO          ZERO OUT FLAGS
   235C 3A 01 2427           2846         SBN   R41FLG,X'01'            SET 2ND FET FLAG.
   2360 38 02 0A0C           2847 R41FET TBN   UDT2,X'02'              IS 3RD FET INSTALLED?
   2364 C0 90 236C           2848         BF    R41LOF                  BR IF NOT.
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    2368 3A 02 2427              2849         SBN   R41FLG,X'02'          SET 3RD FET FLAG.
    236C 31 4C 2427              2850 R41LDF  LIO   R41FLG,HDB4             LIO FLAGS TO HDB'S 18,19
    2370 3A 01 554D              2851         SBN   EHBP,X'01'             SET ERROR-HALT-BYPASS ON
    2374 3C FF 5564              2852         MVI   LPCNT,X'FF'            INCREASE MICRO DELAY
    2378 C0 87 54FE              2853         B     DOMICR                 GO EXECUTE MICROPROGRAM
    237C 5C                237C  2854         DC    XL1'5C'                 ERROR HALT 50
    237D 5017              237E  2855 R41EX1  DC    XL2'5017'               EXPECTED RESULTS
    237F 0D 01 5FE6 237E         2856         CLC   STATAC(2),R41EX1       TEST FOR ERROR
    2385 C0 81 0216              2857         BE    LINK                   EXIT ROUTINE IF EQUAL
                                 2858 * PREPARATION OF ERROR PRINTOUT
    2389 30 4B 2486              2859         SNS   R41EXL,HDB3            FETACH EXPECTED LINK INFO
    238D F3 58 80                2860         SIO   X'80',SIOI             DISABLE ATTACHMENT
    2390 30 4B 2488              2861         SNS   R41ACL,HDB3            FETCH ACTUAL LINK INFO
    2394 C0 87 021E              2862         B     UNPACK                 UNPACK
    2398 02                2398  2863         DC    XL1'02'                 EXPECTED
    2399 2486              239A  2864         DC    AL2(R41EXL)              LINK INFO AND
    239B 2443              239C  2865         DC    AL2(R41EM1)               MOVE INTO OUTPUT
    239D 0C 03 2484 2443         2866         MVC   R41EM4(4),R41EM1           MESSAGE. USED TWICE.
    23A3 C0 87 021E              2867         B     UNPACK                 UNPACK
    23A7 02                23A7  2868         DC    XL1'02'                 ACTUAL
    23A8 2488              23A9  2869         DC    AL2(R41ACL)              LINK INFO INTO
    23AA 2472              23AB  2870         DC    AL2(R41EM3)               ERROR MESSAGE.
    23AC C0 87 021A              2871         B     PRINT                  BR TO PRINT EM1 AND EM2
    23B0 82                23B0  2872         DC    XL1'82'
    23B1 39                23B1  2873         DC    IL1'57'
    23B2 2460              23B3  2874         DC    AL2(R41EM2)
    23B4 C0 87 021A              2875         B     PRINT                  BR TO PRINT
    23B8 82                23B8  2876         DC    XL1'82'                  'LINK INFO WAS XXXX'
    23B9 12                23B9  2877         DC    IL1'18'
    23BA 2472              23BB  2878         DC    AL2(R41EM3)
    23BC C0 87 021A              2879         B     PRINT                  BR TO PRINT
    23C0 82                23C0  2880         DC    XL1'82'                  'LINK INFO S/B XXXX'
    23C1 12                23C1  2881         DC    IL1'18'
    23C2 2484              23C3  2882         DC    AL2(R41EM4)
    23C4 0C 03 5601 2472         2883         MVC   ERRLOG(4),R41EM3
    23CA 0C 03 65FD 2484         2884         MVC   ERRLOG+4(4),R41EM4
    23D0 3C 5C 65F2              2885         MVI   ERRHLT,X'5C'
    23D4 3C 1B 65F1              2886         MVI   ERRRTN,X'1B'
    23D8 C0 87 63FE              2887         B     ELPO
    23DC C0 87 0222              2888         B     HALT                   BR TO HALT
    23E0 145C              23E1  2889         DC    XL2'145C'
    23E2 C0 87 0216              2890         B     LINK                   EXIT ROUTINE.
                                 2891 *-------------------------------*
                                 2892 * START OF MICROPROGRAM LISTING *
                                 2893 *-------------------------------*
                           23E6  2894 R41MCS EQU   *
    23E6 2819                    2895         DC    XL2'2819'   000  LR 08,19 MOVE FLAG TO HDB 08
    23E8 265E                    2896         DC    XL2'265E'   001  LR 06,3E MOVE LINK HA TO HDB 06
    23EA 275F                    2897         DC    XL2'275F'   002  LR 07,3F MOVE LINK LO TO HDB 07
    23EC C6F0                    2898         DC    XL2'C6F0'   003  SBF 6,X'F0'  CLEAN UP HIGH LINK
    23EE F880                    2899         DC    XL2'F880'   004  TBN 8,X'80'  FIRST-COMP. FLAG ON?
    23F0 9018                    2900         DC    XL2'9018'   005  BOC,0       TO ADDR 018 IF NOT
    23F2 B616                    2901         DC    XL2'B616'   006  CIR 06,16    HIGH LINK DATA EQUAL EXP.?
    23F4 9007                    2902         DC    XL2'9007'   007  BOC,0       TO ADDR 007 IF NOT
    23F6 B717                    2903         DC    XL2'B717'   008  CIR 07,17    LOW LINK DATA EQUAL EXP.?
    23F8 9009                    2904         DC    XL2'9009'   009  BOC,0       TO ADDR 009 IF NOT
    23FA 501C                    2905         DC    XL2'501C'   00A  BOS,0       TO ADDR 01C
    23FC 9018                    2906         DC    XL2'9018'   00B  BOC,0       BR OVER HI INC IF NON-ZERO
    23FE 1630                    2907         DC    XL2'1630'   00C  INC 16      INC BR-ADDRESS HIGH
    2400 E903                    2908         DC    XL2'E903'   00D  CI 09,X'03'  FIRST ADDR OF 2ND FET?
    2402 9011                    2909         DC    XL2'9011'   00E  BOC,0       BR TO ADDR 011 IF NOT
    2404 F801                    2910         DC    XL2'F801'   00F  TBN 8,X'01'  IS 2ND FET INSTALLED?
    2406 9017                    2911         DC    XL2'9017'   010  BOC,0       BR TO EXP. RES. IF NOT.
    2408 E907                    2912         DC    XL2'E907'   011  CI 09,X'07'  FIRST ADDR OF 3RD FET?
    240A 9015                    2913         DC    XL2'9015'   012  BOC,0       BR TO ADDR 015 IF NOT
    240C F802                    2914         DC    XL2'F802'   013  TBN 8,X'02'  IS 3RD FET INSTALLED?
    240E 9017                    2915         DC    XL2'9017'   014  BOC,0       BR TO EXP. RES. IF NOT.
    2410 E908                    2916         DC    XL2'E908'   015  CI 09,X'08'  FIRST ADDR BEYOND 3RD FET?
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    2412 9018              2413 2917         DC    XL2'9018'   016  BOC,0       BR TO ADDR 018 IF NOT
    2414 5017              2415 2918         DC    XL2'5017'   017  BOS,0       HANG. EXPECTED RESULTS
    2416 6880              2417 2919         DC    XL2'6880'   018  SBN 8,X'80' SET FIRST-COMP FLAG
    2418 2928              2419 2920         DC    XL2'2928'   019  LR 19,08    MOVE CORRECTED FLG TO 19
    241A 3637              241B 2921         DC    XL2'3637'   01A  BR 16,17    BR-REG FROM HDB 16,17
    241C 501B              241D 2922         DC    XL2'501B'   01B  BOS,0       ERROR, HANG
    241E 2916              241F 2923         DC    XL2'2916'   01C  LR 09,16    MOVE ADDR-HI TO HDB 9
    2420 1730              2421 2924         DC    XL2'1730'   01D  INC,17      INC BRANCH ADDR-LO
    2422 5008              2423 2925 R41MCE  DC    XL2'5008'   01E  BOS,0       TO ADDR 008
                           2424 2926
                           2425 2927
    2424 001F              2425 2928 R41FRS  DC    XL2'001F'                    FIRST ADDRESS
    2426 0000              2427 2929 R41FLG  DC    XL2'0000'                    FLAGS
    2428 C2D9C1D5C3C84040  2443 2930 R41EM1  DC    CL28'BRANCH REGISTER TO ADDR XXXX'
    2430 C5C7C9E2E3C5D540        2930
    2438 E3D640C1C4C4D540        2930
    2440 E7E7E7E7                2930
    2444 40C1D5C440C2C1D3  2460  2931 R41EM2  DC    CL29' AND BAL BACK TO ADDRESS 0000'
    244C 40C2C1C3D240E3D6        2931
    2454 40C1C4C4D9C5E4E2        2931
    245C 40F0F0F0F0              2931
    2461 D3C9D5D240C9D5C6  2472  2932 R41EM3  DC    CL18'LINK INFO WAS XXXX'
    2469 D640E6C1E240E7E7        2932
    2471 E7E7                    2932
    2473 D3C9D5D240C9D5C6  2484  2933 R41EM4  DC    CL18'LINK INFO S/B XXXX'
    247B D640E261C240E7E7        2933
    2483 E7E7                    2933
    2485 0000              2486  2934 R41EXL  DC    XL2'0000'                    EXPECTED LINK INFO
    2487 0000              2488  2935 R41ACL  DC    XL2'0000'                    ACTUAL LINK INFO
    2489 0000              248A  2936 R41CTR  DC    XL2'0000'                    ROUTINE 41 COUNTER
    248B D000              248C  2937 XD000   DC    XL2'D000'                    CONSTANT
                                 2938
                                 2939
                                 2940 ********************************************************************
                                 2941 * ROUTINE 1C EXPANDED HDB ADDRESSING (10 TO 3F) USING CIR OP.     *
                                 2942 ********************************************************************
    248D 1C                248D  2943 RT1C   DC    XL1'1C'                      ROUT NO.
    248E 00                248E  2944         DC    XL1'00'                      NO MANUAL INTERVENTION
    248F 24FF              2490  2945         DC    AL2(RT1D)                    ADDR OF NEXT ROUT.
                                 2946 *
    2491 C0 87 021A              2947         B     PRINT                        PRINT ROUT. HEADING
    2495 01                2495  2948         DC    XL1'01'
    2496 1E                2496  2949         DC    IL1'30'
    2497 24BA              2498  2950         DC    AL2(R30HDR)
    2499 C0 87 24BB              2951         B     RT30GO
    249D D9D6E4E340F1C340  24BA  2952 R30HDR  DC    CL30'ROUT 1C HDB 10-3F ADDR; CIR OP'
    24A5 C8CAC240F1F06DF3        2952
    24AD C640C1C4C4D95C40        2952
    24B5 C3C9D940D6D7            2952
    24BB C0 87 5918              2953 RT30GO B     LOADCS                       GO LOAD MICROPROGRAM
    24BF 83                24BF  2954         DC    XL1'83'                      DISABLE UPON ENTRY, FILL 2ND FSQ
                                 2955 *                                        WITH BOS, 0 ON ADDRESS
    24C0 24CF              24C1  2956         DC    AL2(R30MCS)                  START OF MICROCODE
    24C2 24FE              24C3  2957         DC    AL2(R30MCE)                  END OF MICROCODE
    24C4 C0 87 54FE              2958         B     DOMICR                       GO EXECUTE MICROCODE
    24C8 30                24C8  2959         DC    XL1'30'                      ERROR HALT -30-
    24C9 5015              24CA  2960         DC    XL2'5015'                    EXPECTED RESULTS
    24CB C0 87 0216              2961         B     LINK                         GO TO NEXT ROUTINE
                                 2962 *
                                 2963 *-------------------------------*
                                 2964 * START OF MICROPROGRAM LISTING *
                                 2965 *-------------------------------*
                           24CF  2966 R30MCS EQU   *
    24CF 7355                    2967         DC    XL2'7355'   000  IC HDB03=55
    24D1 2323                    2968         DC    XL2'2323'   001  LR HDB 03 TO HDB 13
    24D3 2383                    2969         DC    XL2'2383'   002  LR HDB 03 TO HDB 23
    24D5 23A3                    2970         DC    XL2'23A3'   003  LR HDB 03 TO HDB 33
    24D7 73AA                    2971         DC    XL2'73AA'   004  IC HDB 03=AA
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   24D9 7455             24DA 2972         DC    XL2'7455'   005   IC MDB 04=55
   24DB B413             24DC 2973         DC    XL2'B413'   006   CIR 04,13
   24DD 9C09             24DE 2974         DC    XL2'9C09'   007   BOC,3 TO ADDR 009
   24DF 5008             24E0 2975         DC    XL2'5008'   008   ERROR, HANG
   24E1 2323             24E2 2976         DC    XL2'2323'   009   LR MDB 03 TO MDB 13
   24E3 B413             24E4 2977         DC    XL2'B413'   00A   CIR 04,13
   24E5 9C16             24E6 2978         DC    XL2'9C16'   00B   BOC,3 SHLD NOT BR TO ADDR 016
   24E7 B443             24E8 2979         DC    XL2'B443'   00C   CIR 04,23
   24E9 9C0F             24EA 2980         DC    XL2'9C0F'   00D   BOC,3 TO ADDR 00F
   24EB 500E             24EC 2981         DC    XL2'500E'   00E   ERROR, HANG
   24ED 2383             24EE 2982         DC    XL2'2383'   00F   LR 03 TO 23
   24EF B443             24F0 2983         DC    XL2'B443'   010   CIR 04,23
   24F1 9C17             24F2 2984         DC    XL2'9C17'   011   BOC,3 SHLD NOT BR TO ADDR 017
   24F3 B3A4             24F4 2985         DC    XL2'B3A4'   012   CIR 33,04
   24F5 9C15             24F6 2986         DC    XL2'9C15'   013   BOC,3 TO ADDR 015
   24F7 5014             24F8 2987         DC    XL2'5014'   014   ERROR, HANG
   24F9 5015             24FA 2988         DC    XL2'5015'   015   EXPECTED RESULTS
   24FB 5016             24FC 2989         DC    XL2'5016'   016   ERROR, HANG
   24FD 5017             24FE 2990 R30NCE  DC    XL2'5017'   017   ERROR, HANG
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2992 ********************************************************************
                         2993 * ROUTINE 1D EXPANDED MDB ADDRESSING (10-TO-3F) USING SHIFT OP.   *
                         2994 ********************************************************************
   24FF 1D               24FF 2995 RT1D    DC    XL1'1D'                  ROUTINE NUMBER
   2500 00               2500 2996         DC    XL1'00'                  NO MANUAL INTERVENTION
   2501 2503             2502 2997         DC    AL2(RT1E)                ADDR OF NEXT ROUTINE
                         2998 *
   2503 C0 87 021A             2999         B     PRINT                    PRINT ROUTINE HEADING
   2507 01               2507 3000         DC    XL1'01'
   2508 20               2508 3001         DC    IL1'32'
   2509 252E             250A 3002         DC    AL2(R31HDR)
   250B C0 87 252F             3003         B     RT31GO
   250F D9D8E4E340F1C440 252E 3004 R31HDR  DC    CL32'ROUT 1D MDB 10-3F ADDR; SHIFT OP.
   2517 C8C4C240F1F06CF3       3004
   251F C640C1C4C4095840       3004
   2527 E2C8C9C6E340D6D7       3004
   252F C0 87 5918             3005 RT31GO B     LOADCS                   GO LOAD MICROPROGRAM
   2533 83               2533 3006         DC    XL1'83'                  DISABLE UPON ENTRY, FILL SECOND
                         3007 *                                           FSQ WITH BOS,0 ON ADDRESS.
   2534 2543             2535 3008         DC    AL2(R31MCS)              START OF MICROCODE
   2536 2582             2537 3009         DC    AL2(R31MCE)              END OF MICROCODE
   2538 C0 87 54FE             3010         B     CONICR                   GO DO MICROCODE
   253C 31               253C 3011         DC    XL1'31'                  ERROR HALT  -31-
   253D 5018             253E 3012         DC    XL2'5018'                EXPECTED RESULTS
   253F C0 87 0216             3013         B     LINK                     GO TO NEXT ROUTINE
                         3014 *
                         3015 *-----------------------------*
                         3016 * START OF MICROPROGRAM LISTING *
                         3017 *-----------------------------*
                         2543 3018 R31MCS EQU   *
   2543 75AA             2544 3019         DC    XL2'75AA'   000   MDB 05=AA
   2545 2525             2546 3020         DC    XL2'2525'   001   LR MDB 05 TO 15
   2547 2585             2548 3021         DC    XL2'2585'   002   LR MDB 05 TO 25
   2549 25A5             254A 3022         DC    XL2'25A5'   003   LR MDB 05 TO 35
   254B 7501             254C 3023         DC    XL2'7501'   004   IC MDB 05=01
   254D 76AA             254E 3024         DC    XL2'76AA'   005   IC MDB 06=AA
   254F 7755             2550 3025         DC    XL2'7755'   006   IC MDB 07=55
   2551 B615             2552 3026         DC    XL2'B615'   007   CIR 06,15
   2553 9008             2554 3027         DC    XL2'9008'   008   BOC,0        ERROR, HANG
   2555 1560             2556 3028         DC    XL2'1560'   009   SL 15   SHIFT MDB 15, NOW=55
   2557 B715             2558 3029         DC    XL2'B715'   00A   CIR 07,15
   2559 9008             255A 3030         DC    XL2'9008'   00B   BOC,0        ERROR, HANG
   255B B615             255C 3031         DC    XL2'B615'   00C   CIR,06,15
   255D 9C0D             255E 3032         DC    XL2'9C0D'   00D   BOC,3        ERROR, HANG
   255F 15C0             2560 3033         DC    XL2'15C0'   00E   SL 25   SHFT MDB 25, NOW=55
   2561 B745             2562 3034         DC    XL2'B745'   00F   CIR 07,25
   2563 9010             2564 3035         DC    XL2'9010'   010   BOC,0        ERROR, HANG
   2565 B586             2566 3036         DC    XL2'B586'   011   CIR 25,06
   2567 9C12             2568 3037         DC    XL2'9C12'   012   BOC,3        ERROR, HANG
   2569 15E0             256A 3038         DC    XL2'15E0'   013   SL 35 SHIFT MDB 35  NOW=55
   256B B745             256C 3039         DC    XL2'B745'   014   CIR 07,25
   256D 9015             256E 3040         DC    XL2'9015'   015   BOC,0        ERROR, HANG
   256F B655             2570 3041         DC    XL2'B655'   016   CIR 06,35
   2571 9C17             2572 3042         DC    XL2'9C17'   017   BOC,3 SHLD NOT BR TO SELF
   2573 5018             2574 3043         DC    XL2'5018'   018   BOS,0 EXPECTED RESULTS
   2575 5019             2576 3044         DC    XL2'5019'   019   BOS,0 ERROR, HANG
   2577 501A             2578 3045         DC    XL2'501A'   01A   BOS,0 ERROR, HANG
   2579 501B             257A 3046         DC    XL2'501B'   01B   BOS,0 ERROR, HANG
   2578 501C             257C 3047         DC    XL2'501C'   01C   BOS,0 ERROR, HANG
   257D 501D             257E 3048         DC    XL2'501D'   01D   BOS,0 ERROR, HANG
   257F 501E             2580 3049         DC    XL2'501E'   01E   BOS,0 ERROR, HANG
   2581 501F             2582 3050 R31NCE  DC    XL2'501F'   01F   BOS,0 ERROR, HANG
                         3051 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3053 ************************************************************
                         3054 * ROUTINE 1E EXPANDED HDB ADDR. (10-TO-3F) USING XR,TBFR, INC OPS.  *
                         3055 ************************************************************
   2583 1E               2583 3056 RT1E   DC    XL1'1E'                  ROUT NO.
   2584 00               2584 3057        DC    XL1'00'                  NO MANUAL INTERVENTION
   2585 2634             2586 3058        DC    AL2(RT1F)                ADDR OF NEXT ROUTINE
                         3059 *
   2587 C0 87 021A             3060        B     PRINT                    PRINT ROUTINE HEADING
   2588 01               2589 3061        DC    XL1'01'
   258C 29               258C 3062        DC    IL1'41'
   258D 2588             258E 3063        DC    AL2(R32HDR)
   258F C0 87 258C             3064        B     RT32GO
   2593 D9D6E4E340F1C540 2588 3065 R32HDR DC    CL41'ROUT 1E HDB 10-3F ADDR; XR, TBFR, INC OPS'
   259B C8C4C240F1F06F3        3065
   25A3 C640C1C4C4D95540       3065
   25AB E7D96B40E3C2C4D9       3065
   25B3 6840C9D5C340D4D7       3065
   25BB E2                     3065
   25BC C0 87 5918             3066 RT32GO B     LOADCS                   GO LOAD MICROPROGRAM
   25C0 83               25C0 3067        DC    XL1'83'                  DISABLE UPON ENTRY, FILL 2ND FSQ
                         3068 *                                          WITH BOS,0 ON ADDRESS
   25C1 25D0             25C2 3069        DC    AL2(R32MCS)              START OF MICROPROGRAM
   25C3 2633             25C4 3070        DC    AL2(R32MCE)              END OF MICROPROGRAM
   25C5 C0 87 54FE             3071        B     DOMICR                   GO EXECUTE MICROPROGRAM
   25C9 32               25C9 3072        DC    XL1'32'                  ERROR HALT -32-
   25CA 5031             25CB 3073        DC    XL2'5031'                EXPECTED RESULTS
   25CC C0 87 0216             3074        B     LINK                     GO TO NEXT ROUTINE
                         25D0 3075 R32MCS EQU   *
                         3076 *-----------------------------*
                         3077 * START OF MICROPROGRAM LISTING *
                         3078 *-----------------------------*
   25D0 7404             25D1 3079        DC    XL2'7404'    000   IC HDB 04=04
   25D2 7105             25D3 3080        DC    XL2'7105'    001   IC HDB 01=05
   25D4 7206             25D5 3081        DC    XL2'7206'    002   IC HDB 02=06
   25D6 2321             25D7 3082        DC    XL2'2321'    003   LR HDB 01 TO 13
   25D8 2422             25D9 3083        DC    XL2'2422'    004   LR HDB 02 TO 14
   25DA 2681             25DB 3084        DC    XL2'2681'    005   LR HDB 01 TO 26
   25DC 2782             25DD 3085        DC    XL2'2782'    006   LR HDB 02 TO 27
   25DE 2AA1             25DF 3086        DC    XL2'2AA1'    007   LR HDB 01 TO 3A
   25E0 2BA2             25E1 3087        DC    XL2'2BA2'    008   LR HDB 02 TO 3B
   25E2 8324             25E3 3088        DC    XL2'8324'    009   TBFR 13,04
   25E4 9C0A             25E5 3089        DC    XL2'9C0A'    00A   BOC,3 SHLD NOT BR TO SELF.
   25E6 A334             25E7 3090        DC    XL2'A334'    00B   XR 13,14   13 NOW=03
   25E8 8324             25E9 3091        DC    XL2'8324'    00C   TBFR 13,04
   25EA 900D             25EB 3092        DC    XL2'900D'    00D   BOC,0 SHLD NOT BR TO SELF.
   25EC 1330             25ED 3093        DC    XL2'1330'    00E   INC 13 TO=04
   25EE 8324             25EF 3094        DC    XL2'8324'    00F   TBFR 13,04
   25F0 9C10             25F1 3095        DC    XL2'9C10'    010   BOC,3 SHLD NOT BR TO SELF.
   25F2 8684             25F3 3096        DC    XL2'8684'    011   TBFR 26,04
   25F4 9C12             25F5 3097        DC    XL2'9C12'    012   BOC,3 SHLD NOT BR TO SELF.
   25F6 A6C7             25F7 3098        DC    XL2'A6C7'    013   XR 26,27   26 NOW=03
   25F8 8684             25F9 3099        DC    XL2'8684'    014   TBFR 26,04
   25FA 9015             25FB 3100        DC    XL2'9015'    015   BOC,0 SHLD NOT BR TO SELF.
   25FC 1690             25FD 3101        DC    XL2'1690'    016   INC 26 TO=04
   25FE 8684             25FF 3102        DC    XL2'8684'    017   TBFR 26,04
   2600 9C18             2601 3103        DC    XL2'9C18'    018   BOC,3 SHLD NOT BR TO SELF.
   2602 8AA4             2603 3104        DC    XL2'8AA4'    019   TBFR 3A,04
   2604 9C1A             2605 3105        DC    XL2'9C1A'    01A   BOC,3 SHLD NOT BR TO SELF.
   2606 AAFB             2607 3106        DC    XL2'AAFB'    01B   XR 3A,3B   3A NOW=03
   2608 8AA4             2609 3107        DC    XL2'8AA4'    01C   TBFR 3A,04
   260A 901D             260B 3108        DC    XL2'901D'    01D   BOC,0 SHLD NOT BR TO SELF.
   260C 1AB0             260D 3109        DC    XL2'1AB0'    01E   INC 3A TO=04
   260E 8AA4             260F 3110        DC    XL2'8AA4'    01F   TBFR 3A,04
   2610 9C20             2611 3111        DC    XL2'9C20'    020   BOC,3 SHLD NOT BR TO SELF.
   2612 7E01             2613 3112        DC    XL2'7E01'    021   IC HDB 0E=01
   2614 8E14             2615 3113        DC    XL2'8E14'    022   TBFR 0E,14
   2616 9023             2617 3114        DC    XL2'9023'    023   BOC,0 SHLD NOT BR TO SELF.
   2618 1430             2619 3115        DC    XL2'1430'    024   INC 14
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   261A 8E14             261B 3116        DC    XL2'8E14'    025   TBFR 0E,14
   261C 9C26             261D 3117        DC    XL2'9C26'    026   BOC,3 SHLD NOT BR TO SELF.
   261E 8E47             261F 3118        DC    XL2'8E47'    027   TBFR 0E,27
   2620 9028             2621 3119        DC    XL2'9028'    028   BOC,0 SHLD NOT BR TO SELF
   2622 1790             2623 3120        DC    XL2'1790'    029   INC 27
   2624 8E47             2625 3121        DC    XL2'8E47'    02A   TBFR 0E,27
   2626 9C2B             2627 3122        DC    XL2'9C2B'    02B   BOC,3 SHLD NOT BR TO SELF
   2628 8E5B             2629 3123        DC    XL2'8E5B'    02C   TBFR 0E,3B
   262A 902D             262B 3124        DC    XL2'902D'    02D   BOC,0 SHLD NOT BR TO SELF
   262C 1BB0             262D 3125        DC    XL2'1BB0'    02E   INC 3B
   262E 8E5B             262F 3126        DC    XL2'8E5B'    02F   TBFR 0E,3B
   2630 9C30             2631 3127        DC    XL2'9C30'    030   BOC,3 SHLD NOT BR TO SELF
   2632 5031             2633 3128 R32MCE DC    XL2'5031'    031   BOS,0 EXPECTED RESULTS
                         3129 *
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3131 ************************************************************
                         3132 * ROUTINE 1F EXPANDED MDB ADDR.(10-TO-3F) USING BR OP.    *
                         3133 ************************************************************
  2634 1F                2634 3134 RT1F   DC    XL1'1F'                  ROUT NO.
  2635 00                2635 3135        DC    XL1'00'                  NO MANUAL INTERVENTION
  2636 2688              2637 3136        DC    AL2(RT20)                ADDR OF NEXT ROUTINE
                         3137 *
  2638 C0 87 021A              3138       B     PRINT                    PRINT ROUTINE HEADING
  263C 01                263C 3139        DC    XL1'01'
  263D 1D                263D 3140        DC    IL1'29'
  263E 2660              263F 3141        DC    AL2(R33HDR)
  2640 C0 87 2661              3142       B     RT33GO
  2644 D9D6E4E340F1C640  2660 3143 R33HDR DC    CL29'ROUT 1F MDB 10-3F ADDR; BR OP'
  264C C8C4C240F1F06 0F3       3143
  2654 C640C1C4C4D95 E40       3143
  265C C2D940D6D7              3143
  2661 C0 87 5918              3144 RT33GO B     LOADCS                   GO LOAD MICROPROGRAM
  2665 91                2665 3145        DC    XL1'91'
  2666 267E              2667 3146        DC    AL2(R33MCS)              START OF MICROCODE
  2668 2699              2669 3147        DC    AL2(R33MCE)              END OF MICROCODE
  266A C0 87 5918              3148       B     LOADCS                   GO LOAD MICROCODE
  266E A2                266E 3149        DC    XL1'A2'                  IN 2ND FSG
  266F 269A              2670 3150        DC    AL2(R33MC1)              START OF MICROCODE
  2671 2687              2672 3151        DC    AL2(R33MC2)              END OF MICROCODE
  2673 C0 87 54FE              3152       B     DOMICR                   GO DO MICROCODE
  2677 33                2677 3153        DC    XL1'33'                  ERROR HALT -33-
  2678 5107              2679 3154        DC    XL2'5107'                EXPECTED RESULTS
  267A C0 87 0216              3155       B     LINK                     EXIT ROUTINE
                               3156 *--------------------------*
                               3157 * START OF MICROPROGRAM LISTING *
                               3158 *--------------------------*
                         267E 3159 R33MCS EQU   *
  267E 7101              267F 3160        DC    XL2'7101'    000   IC MDB 01=01
  2680 7202              2681 3161        DC    XL2'7202'    001   IC MDB 02=02
  2682 7303              2683 3162        DC    XL2'7303'    002   IC MDB 03=03
  2684 740D              2685 3163        DC    XL2'740D'    003   IC MDB 04=0D
  2686 2521              2687 3164        DC    XL2'2521'    004   LR MDB 01 TO 15, MDB 15 NOW=01
  2688 2622              2689 3165        DC    XL2'2622'    005   LR MDB 02 TO 16, MDB 16 NOW=02
  268A 2723              268B 3166        DC    XL2'2723'    006   LR MDB 03 TO 17, MDB 17 NOW=03
  268C 2824              268D 3167        DC    XL2'2824'    007   LR MDB 04 TO 18, MDB 18 NOW=0D
  268E 2981              268F 3168        DC    XL2'2981'    008   LR MDB 01 TO 29, MDB 29 NOW=01
  2690 2A82              2691 3169        DC    XL2'2A82'    009   LR MDB 02 TO 2A, MDB 2A NOW=02
  2692 2BA3              2693 3170        DC    XL2'2BA3'    00A   LR MDB 03 TO 3B, MDB 3B NOW=03
  2694 2CA1              2695 3171        DC    XL2'2CA1'    00B   LR MDB 01 TO 3C, MDB 3C NOW=01
  2696 3538              2697 3172        DC    XL2'3538'    00C   BR 15,18 TO ADDRESS  10D
  2698 500D              2699 3173 R33MCE DC    XL2'500D'    00D   BOS,0 ERROR, HANG
                               3174 *
                         269A 3175 R33MC1 EQU   *
  269A 5100              2698 3176        DC    XL2'5100'    100   BOS,0 ERROR, HANG
  269C 357B              269D 3177        DC    XL2'357B'    101   BR 15,3B TO ADDRESS 103
  269E 5102              269F 3178        DC    XL2'5102'    102   BOS,0 ERROR, HANG
  26A0 7507              26A1 3179        DC    XL2'7507'    103   IC MDB 05=07
  26A2 2DA5              26A3 3180        DC    XL2'2DA5'    104   LR MDB 05 TO 3D, MDB 3D,NOW=07
  26A4 3CFD              26A5 3181        DC    XL2'3CFD'    105   BR 3C,3D TO ADDRESS 0107.
  26A6 5106              26A7 3182        DC    XL2'5106'    106   BOS,0 ERROR, HANG
  26A8 5107              26A9 3183        DC    XL2'5107'    107   BOS,0 EXPECTED RESULTS.
  26AA 5108              26AB 3184        DC    XL2'5108'    108   BOS,0 ERROR, HANG
  26AC 5109              26AD 3185        DC    XL2'5109'    109   BOS,0 ERROR, HANG
  26AE 510A              26AF 3186        DC    XL2'510A'    10A   BOS,0 ERROR, HANG
  26B0 510B              26B1 3187        DC    XL2'510B'    10B   BOS,0 ERROR, HANG
  26B2 510C              26B3 3188        DC    XL2'510C'    10C   BOS,0 ERROR, HANG
  26B4 3995              26B5 3189        DC    XL2'3995'    10D   BR 29,15 TO ADDRESS 101
  26B6 510E              26B7 3190 R33MC2 DC    XL2'510E'    10E   BOS,0 ERROR, HANG
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3192 ************************************************************************
                         3193 *       ROUTINE 20 - MBAR/CURAR HARDWARE TESTS                         *
                         3194 ************************************************************************
                         3195 *                                                                      *
                         3196 *       THIS ROUTINE TESTS THE MBAR AND CURAR HARDWARE AND THE SSN     *
                         3197 *       WHICH MOVES THE VALUE OF MBAR TO CURAR.  THE VALUES USED ARE   *
                         3198 *       7FF, 000, 555 AND 2AA.  THE MICROPROGRAM IS ENTERED 4 TIMES.   *
                         3199 *       BOS,1 WHICH TESTS FOR MBAR = CURAR IS ALSO TESTED.             *
                         3200 *                                                                      *
                         3201 ************************************************************************
                         3202
  2688 20                2688 3203 RT20   DC    XL1'20'                  ROUTINE NUMBER
  2689 00                2689 3204        DC    XL1'00'                  NO MANUAL INTERVENTION
  268A 2772              2688 3205        DC    AL2(RT21)                ADDRESS OF NEXT ROUTINE
                               3206
                         26C8 3207        USING R16K01,XR1
  26BC C2 01 26C8              3208       LA    R16K01,XR1               INITIALIZE XR1 FOR INDEXING
                               3209
  26C0 C0 87 021A              3210       B     PRINT                    PRINT ROUTINE HEADING
  26C4 01                26C4 3211        DC    XL1'01'
  26C5 18                26C5 3212        DC    IL1'24'
  26C6 2749              26C7 3213        DC    AL2(RT16OP)
                               3214
  26C8 C0 87 5918        26C8 3215 R16K01 B     LOADCS                   .GO LOAD MICROPROGRAM
  26CC 83                26CC 3216        DC    XL1'83'                  .DISABLE UPON ENTRY, FILL 2ND
                               3217 *                                    FSG WITH BCS,0 ON ADDRESS
  26CD 274E              26CE 3218        DC    AL2(R16MCS)              .START OF MICRO CODE
  26CF 2771              26D0 3219        DC    AL2(R16MCE)              .END OF MICROCODE
                               3220
  26D1 0C 01 26F8 56E3         3221       MVC   R16EX2(2),X07FF          .PUT FIRST CONSTANT IN PROGRAM
  26D7 71 48 30                3222 R16RPT LIO  R16EX2(,XR1),MDB0       .LOAD CONSTANT IN MDB 10-11
  26DA 3C 0C 5564              3223       MVI   LPCNT,X'0C'              .INCREASE DELAY
  26DE C0 87 54FE              3224       B     DOMICR                   .GO EXECUTE MICROPROGRAM
  26E2 58                26E2 3225        DC    XL1'58'                  .ERROR HALT -58-
  26E3 5010              26E4 3226        DC    XL2'5010'                .EXPECTED DATA
                               3227
  26E5 30 4D 5FE6              3228       SNS   STATAC,MDB5              .SENSE CURAR CONTENTS
  26E9 1D 01 5FE6 30           3229       CLC   STATAC,R16EX2(2,XR1)      .COMPARE FOR EXPECTED VALUE
  26EE F2 81 08                3230       JE    R16B02                   .CONTINUE IF OKAY
  26F1 C0 87 5DA5              3231 R16RTN B    STATUS                   .ERROR
  26F5 20                26F5 3232        DC    XL1'20'                  .PRINT EXP. & ACT. DATA
  26F6 59                26F6 3233        DC    XL1'59'                  .ERROR HALT -59-
  26F7 0000              26F8 3234 R16EX2 DC    XL2'0'                   .EXPECTED DATA FILLED IN
                               3235
  26F9 0D 01 26F8 56E3         3236 R16B02 CLC   R16EX2(2),X07FF          .CHECK FOR USING DATA = 7FF
  26FF F2 81 16                3237       JE    R16B03                   .IF SO INSERT NEXT DATA
  2702 4D 01 30 0D62           3238       CLC   R16EX2(2,XR1),ZERO       .CHECK FOR USING DATA = 000
  2707 F2 81 16                3239       JE    R16B04                   .IF SO INSERT NEXT DATA
  270A 5D 01 30 85             3240       CLC   R16EX2(2,XR1),X02AA(,XR1) .CHECK FOR USEING DATA = 2AA
  270E F2 81 16                3241       JE    R16B05                   .IF SO INSERT NEXT DATA
  2711 5D 01 30 83             3242       CLC   R16EX2(2,XR1),X0555(,XR1) .CHECK FOR USING DATA = 555
  2715 F2 81 16                3243       JE    R16B06                   .IF SO EXIT ROUTINE
                               3244
  2718 4C 01 30 0D62           3245 R16B03 MVC   R16EX2(2,XR1),ZERO       .SET EXPECTED DATA = 000
  271D D0 87 0F                3246       B     R16RPT(,XR1)             .GO REPEAT ROUTINE
  2720 5C 01 30 85             3247 R16B04 MVC   R16EX2(2,XR1),X02AA(,XR1) .SET EXPECTED DATA = 2AA
  2724 D0 87 0F                3248       B     R16RPT(,XR1)             .GO REPEAT ROUTINE
  2727 5C 01 30 83             3249 R16B05 MVC   R16EX2(2,XR1),X0555(,XR1) .SET EXPECTED DATA = 555
  272B D0 87 0F                3250       B     R16RPT(,XR1)             .GO REPEAT ROUTINE
                               3251
  272E C0 87 0216              3252 R16B06 B     LINK                     .GO TO NEXT ROUTINE
                               3253
  2732 D9D6E4E340F2F040 2749   3254 RT16OP DC    CL24'ROUT 20 MBAR/CURAR TESTS'
  273A D4C2C1D961C3E4D9        3254
  2742 C1D940E3C5E2E3E2        3254
                               3255
  274A 0555              2748 3256 X0555  DC    XL2'0555'                .WORK CONSTANT
  274C 02AA              274D 3257 X02AA  DC    XL2'02AA'                .WORK CONSTANT
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3258
                         3259 *-------------------------------*
                         3260 * START OF MICROPROGRAM LISTING *
                         3261 *-------------------------------*
                        274E 3262 R16MCS EQU   *
  274E 2E10              274F 3263        DC    XL2'2E10'    00  LR. MOVE EXPECTED DATA TO HDB 0E
  2750 2F11              2751 3264        DC    XL2'2F11'    01  LR. MOVE EXPECTED DATA TO HDB 0F
  2752 200E              2753 3265        DC    XL2'200E'    02  LR. LOAD MBAR HI FROM HDB 0E
  2754 210F              2755 3266        DC    XL2'210F'    03  LR. LOAD MBAR LO FROM HDB 0F
  2756 1704              2757 3267        DC    XL2'1704'    04  SSN. LOAD CURAR FROM MBAR
  2758 7000              2759 3268        DC    XL2'7000'    05  IC. RESET MBAR
  275A 7100              275B 3269        DC    XL2'7100'    06  IC. RESET MBAR
  275C 540E              275D 3270        DC    XL2'540E'    07  BOS.1  BRANCH IF MBAR = CURAR
  275E 1110              275F 3271        DC    XL2'1110'    08  INC.   INCR. MBAR LO
  2760 9007              2761 3272        DC    XL2'9007'    09  BOC.0  LOOP BACK IF NOT ZERO
  2762 1010              2763 3273        DC    XL2'1010'    0A  INC.   INCR. MBAR HI
  2764 E008              2765 3274        DC    XL2'E008'    0B  CI.  TEST FOR END
  2766 9C12              2767 3275        DC    XL2'9C12'    0C  BOC.3  BRANCH IF ERROR
  2768 5007              2769 3276        DC    XL2'5007'    0D  BOS.0 RETURN TO LOOP
  276A 2A20              276B 3277        DC    XL2'2A20'    0E  LR. LOAD MBAR HI TO HDB 1A
  276C 2B21              276D 3278        DC    XL2'2B21'    0F  LR. LOAD MBAR LO TO HDB 1B
  276E 5010              276F 3279        DC    XL2'5010'    10  HANG. TEST COMPLETE
  2770 5000              2771 3280 R16MCE DC    XL2'5000'    11  BRANCH TO RESTART PROGRAM
                         3281
                         3281
                         3282 ********************************************************************
                         3283 * ROUTINE 21 MESSAGE BUFFER ADDRESSING TESTS                       *
                         3284 *                                                                  *
                         3285 *  MICROCODE, RUNNING IN CS ADDR 000-TO-0FF, LOADS ALL FET STORAGE *
                         3286 *  CARDS WITH INCREMENTING DATA, 01-TO-FF. (HEX 00 IS NOT USED.)   *
                         3287 *  STARTING AT ADDRESS 0100                                        *
                         3288 *  AS EACH BYTE IS WRITTEN, IT IS READ BACK FOR VERIFICATION.      *
                         3289 *  AFTER THE WRITE-WITH-READBACK-CHECK PASS IS COMPLETE, THERE     *
                         3290 *  IS A SECOND PASS THROUGH WITH READOUT AND CHECK ONLY            *
                         3291 ********************************************************************
                         3292
  2772 21                2772 3293 RT21   DC    XL1'21'      ROUTINE NUMBER
  2773 00                2773 3294        DC    XL1'00'      NO MANUAL INTERVENTION
  2774 2946              2775 3295        DC    AL2(RT22)    ADDRESS OF NEXT ROUTINE
                         3296
                        27E7 3297        USING R17B02,XR1
  2776 C2 01 27E7        3298        LA    R17B02,XR1   INITIALIZE XR1 FOR INDEXING
                         3299
  277A C0 87 021A        3300        B     PRINT        PRINT ROUTINE HEADING
  277E 01                277E 3301        DC    XL1'01'
  277F 27                277F 3302        DC    XL1'39'
  2780 286D              2781 3303        DC    AL2(RT17OP)
                         3304
  2782 C0 87 5918        3305 R17K01 B     LOADCS       .GO LOAD MICROPROGRAM
  2786 83                2786 3306        DC    XL1'83'      .DISABLE UPON ENTRY, FILL 2ND
                         3307 *                              FSQ WITH BOS,0 ON ADDRESS
  2787 28C8              2788 3308        DC    AL2(R17MCS)  .START OF MICRO CODE
  2789 2945              278A 3309        DC    AL2(R17MCE)  .END OF MICROCODE
                         3310
  278B 3B 02 2845        3311        SBF   R17P-1,X'02'
  278F 38 02 0A0C        3312        TBN   UDT2,X'02'
  2793 C0 90 2798        3313        BF    R17PP
  2797 3A 02 2845        3314        SBN   R17P-1,X'02'
  2798 F3 58 C0          3315 R17PP  SIO   X'C0',SIOI
  279E 71 48 5F          3316 R17RPT LIO   R17P(,XR1),HDB0   .LOAD PARAMETERS INTO HDB 10-11
  27A1 3A 01 554D        3317        SBN   EHBP,X'01'       .SET ERROR HALT BYPASS BIT ON
  27A5 3C FF 5564        3318        MVI   LPCNT,X'FF'      .INCREASE MICRO DELAY
                         3319
  27A9 C0 87 54FE        3320        B     DOMICR       .GO EXECUTE MICROPROGRAM
  27AD 5C                27AD 3321        DC    XL1'5C'      .ERROR HALT  -5C-
  27AE 503E              27AF 3322 R17EX1 DC    XL2'503E'    .EXPECTED DATA
                         3323
  2780 0D 01 5FE6 27AF   3324        CLC   STATAC(2),R17EX1 .TEST FOR ERROR
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  27B6 C0 81 0216        3325        BE    LINK         EXIT ROUTINE
  27BA 3D 20 5FE6        3326 R17P0  CLI   STATAC,X'20'  .STATAC = E2 IF DATA ERROR
  27BE F2 01 65          3327        JNE   R17HLT       .IF NOT, TAKE THE HALT
  27C1 F3 58 80          3328        SIO   X'80',SIOI   .DISABLE ATTACHMENT
  27C4 30 48 2840        3329        SNS   R17L1,HDB0   .FETCH MBAR (HDB 00-01)
  27C8 30 49 2842        3330        SNS   R17L2,HDB1   .FETCH FLAGS (HDB 02-03)
  27CC 30 4A 2844        3331        SNS   R17L3,HDB2   .FETCH EXP./ACT. DATA
  27D0 3C D4 65F8        3332        MVI   ERRLOG-9,C'M'  .INSERT CHAR FOR LOG OUT       *
  27D4 79 FF 5A          3333        TBF   R17L2-1(,XR1),X'FF'  .TEST FOR FAILURE DURING WRITE
  27D7 F2 10 0D          3334        JT    R17B02       .JUMP IF SO
  27DA 0C 04 2888 28C7   3335        MVC   R17M1(5),R17M6  .INSERT 'READ' IN MESSAGE
  27E0 3C D9 65F9        3336        MVI   ERRLOG-8,C'R'  .MOVE CHAR FOR LOG OUT       *
  27E4 F2 87 0A          3337        J     R17B03       .GO UNPACK REST OF DATA
                         3338
  27E7 0C 04 288B 28C2   3339 R17B02 MVC   R17M1(5),R17M5  .INSERT 'WRITE' IN MESSAGE
  27ED 3C E6 65F9        3340        MVI   ERRLOG-8,C'W'  .INSERT CHAR FOR LOG OUT       *
  27F1 C0 87 021E        3341 R17B03 B     UNPACK       .GO UNPACK MBAR
  27F5 02                27F5 3342        DC    XL1'02'
  27F6 2840              27F7 3343        DC    AL2(R17L1)
  27F8 2898              27F9 3344        DC    AL2(R17M2)
  27FA C0 87 021E        3345        B     UNPACK       .GO UNPACK EXPECTED DATA
  27FE 01                27FE 3346        DC    XL1'01'
  27FF 2843              2800 3347        DC    AL2(R17L3-1)
  2801 28AC              2802 3348        DC    AL2(R17M3)
  2803 C0 87 021E        3349        B     UNPACK       .UNPACK REC'D DATA
  2807 01                2807 3350        DC    XL1'01'
  2808 2844              2809 3351        DC    AL2(R17L3)
  280A 28BD              280B 3352        DC    AL2(R17M4)
                         3353
  280C 0C 02 65FC 28S8   3354        MVC   ERRLOG-5(3),R17M2  .PUT ADDR IN LOG OUT       *
  2812 0C 01 65FE 28AC   3355        MVC   ERRLOG-3(2),R17M3  .PUT EXP. DATA IN LOG OUT  *
  2818 0C 01 6600 28BD   3356        MVC   ERRLOG-1(2),R17M4  .PUT ACT DATA IN LOG OUT   *
  281E C0 87 021A        3357        B     PRINT        .GO PRINT MESSAGE
  2822 82                2822 3358        DC    XL1'82'
  2823 50                2823 3359        DC    IL1'80'      .LENGTH
  2824 28BD              2825 3360        DC    AL2(R17M4)   .ADDRESS
  2826 C0 87 63FE        3361 R17HLT B     ELPO         .GO PRINT LOG OUT       *
  282A C0 87 021A        3362        B     PRINT        .GO SPACE 6
  282E 96                282E 3363        DC    XL1'96'
                         3364
  282F 0C 00 283A 55AE   3365        MVC   R17HC(1),STATHC  .INSERT CORRECT HALT CODE
  2835 C0 87 0222        3366        B     HALT         .GO HALT
  2839 145C              283A 3367 R17HC   DC    XL2'145C'    .HALT -5C-  -8B-  OR  -8C-
  283B C0 87 0216        3368        B     LINK         .GO TO NEXT ROUTINE
                         3369
  283F 0000              2840 3370 R17L1   DC    XL2'0'       .LOG AREA FOR HDB 00-01
  2841 0000              2842 3371 R17L2   DC    XL2'0'       .LOG AREA FOR HDB 02-03
  2843 0000              2844 3372 R17L3   DC    XL2'0'       .LOG AREA FOR HDB 04-05
  2845 8101              2846 3373 R17P    DC    XL2'8101'    .PARAMETERS GET FILLED IN
  2847 D9D6E4E340F2F140  286D 3374 RT17OP  DC    CL39'ROUT 21 MESSAGE BUFFER ADDRESSING TESTS'
  284F D4C5E2E2C1C7C540      3374
  2857 C2E4C6C6C5D94040      3374
  285F C4C4D9C5E2E2C5D5      3374
  2867 C740E3C5E2E3E240      3374
                             3375
  286E D4E2C74840C2E4C6  288B 3376 R17M1   DC    CL30'MSG. BUFFER ERROR DURING XXXXX'
  2876 C6C5D940C5D9D5D6      3376
  287E D940C4E4D9C9D5C7      3376
  2886 40E7E7E7E7E7          3376
  288C 6B40C1C4C4D9476E  2898 3377 R17M2   DC    CL13', ADDR = XXXX'
  2894 40E7E7E7E7            3377
  2899 6B40C4C1E3C14040  28AC 3378 R17M3   DC    CL20', DATA EXPECTED = XX'
  28A1 E7D7C5C3E3C5C440      3378
  28A9 7E40E7E7              3378
  28AD 6B40C4C1E3C14D79  28BD 3379 R17M4   DC    CL17', DATA REC'D = XX'
  28B5 C5C37DC44D7E4CE7      3379
  28BD E7                    3379
  28BE E6D9C9E3C5        28C2 3380 R17M5   DC    CL5'WRITE'
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         28C7 3381 R17M6  DC    CL5'READ '
                              3382
                              3383 *-----------------------------*
                              3384 * START OF MICROPROGRAM LISTING *
                              3385 *-----------------------------*
                         28C8 3386 R17MCS EQU   *
   28C8 2310             28C9 3387        DC    XL2'2310'    00  LR. SET HDB 3 = DATA FLAG
   28CA 2411             28CB 3388        DC    XL2'2411'    01  LR. SET HDB 4 = DATA TO BE WRITTEN
   28CC 7200             28CD 3389        DC    XL2'7200'    02  IC. SET HDB 2 = WRITE FLAG
   28CE 7001             28CF 3390        DC    XL2'7001'    03  IC. RESET MBAR HI = 01
   28D0 7100             28D1 3391        DC    XL2'7100'    04  IC. RESET MBAR LO
   28D2 0584             28D3 3392        DC    XL2'0584'    05  LE. WRITE FROM HDB 4 TO MSG. BUFFER
   28D4 0545             28D5 3393        DC    XL2'0545'    06  LE.  MOVE DATA TO HDB 05 FROM M.B.
   28D6 B405             28D7 3394        DC    XL2'B405'    07  CIR. CHECK DATA
   28D8 9C0A             28D9 3395        DC    XL2'9C0A'    08  BOC,3  BRANCH IF DATA OKAY
   28DA 5009             28DB 3396        DC    XL2'5009'    09  ERROR. HANG
   28DC 1110             28DD 3397        DC    XL2'1110'    0A  INC. INCREMENT MBAR LO
   28DE 9C0F             28DF 3398        DC    XL2'9C0F'    0B  BOC,3 IF ZERO. INCREMENT HI
   28E0 F380             28E1 3399        DC    XL2'F380'    0C  TBN. TEST FOR DATA TC BE INCREMENTED
   28E2 9C13             28E3 3400        DC    XL2'9C13'    0D  BOC,3 BRANCH IF SO
   28E4 5005             28E5 3401        DC    XL2'5005'    0E  BOS,0  LOOP
   28E6 1010             28E7 3402        DC    XL2'1010'    0F  INC. INCREMENT MBAR HI
   28E8 F018             28E9 3403        DC    XL2'F018'    10  TBN. TEST FOR END
   28EA 900C             28EB 3404        DC    XL2'900C'    11  BOC,0  IF NOT RETURN TO LOOP
   28EC 5018             28ED 3405        DC    XL2'5018'    12  BOS,0  BRANCH TO READ LOOP
   28EE 1410             28EF 3406        DC    XL2'1410'    13  INC. INC HDB 4 TO NEXT DATA TO BE USED
   28F0 9C16             28F1 3407        DC    XL2'9C16'    14  BOS,3  BRANCH IF ZERO
   28F2 5005             28F3 3408        DC    XL2'5005'    15  BOS,0  RETURN TO WRITE LOOP
   28F4 1410             28F5 3409        DC    XL2'1410'    16  INC. INC HDB 4 AGAIN
   28F6 5005             28F7 3410        DC    XL2'5005'    17  BOS,0  RETURN TO WRITE LOOP
                              3411
                              3412 *       READ LOOP
                              3413
   28F8 72FF             28F9 3414        DC    XL2'72FF'    18  IC. SET HDB 2 = READ FLAG
   28FA 7001             28FB 3415        DC    XL2'7001'    19  IC. RESET MBAR HI = 01
   28FC 7100             28FD 3416        DC    XL2'7100'    1A  IC.RESET MBAR LO
   28FE 2411             28FF 3417        DC    XL2'2411'    1B  LR. SET HDB 4 TO DATA EXPECTED
   2900 7599             2901 3418        DC    XL2'7599'    1C  IC. PUT 99 IN HDB 5
   2902 0545             2903 3419        DC    XL2'0545'    1D  LE. READ MSG. BUF. TO HDB 5
   2904 B405             2905 3420        DC    XL2'B405'    1E  CIR. CHECK FOR EXPECTED RESULT
   2906 9C21             2907 3421        DC    XL2'9C21'    1F  BRANCH IF OKAY
   2908 5020             2909 3422        DC    XL2'5020'    20  ERROR, HANG
   290A 1110             290B 3423        DC    XL2'1110'    21  INC. INCREMENT MBAR LO
   290C 9C28             290D 3424        DC    XL2'9C28'    22  BOC,3 TO ADDR 28 IF ZERO
   290E F380             290F 3425        DC    XL2'F380'    23  TBN,3,80 TEST FOR DATA INCREMENT
   2910 9C26             2911 3426        DC    XL2'9C26'    24  BOC,3 TO ADDR 26 IF SO
   2912 501C             2913 3427        DC    XL2'501C'    25  BOS,0 TO ADDR 1C TO READ LOOP
   2914 1410             2915 3428        DC    XL2'1410'    26  INC HDB 4 TO NEXT DATA TO BE USED
   2916 9C29             2917 3429        DC    XL2'9C29'    27  BOC,3     BR TO ADDR 29 IF ZERO
   2918 501C             2919 3430        DC    XL2'501C'    28  BOS,0 TO ADDR 1C TO READ LOOP
   291A 1410             291B 3431        DC    XL2'1410'    29  INC HDB 4 AGAIN
   291C 501C             291D 3432        DC    XL2'501C'    2A  BOS,0 TO ADDR 1C TO READ LOOP
                              3433 *       READ LOOP END TESTING
   291E 1010             291F 3434        DC    XL2'1010'    2B  INC MBAR HI
   2920 E008             2921 3435        DC    XL2'E008'    2C  CI 0,X'08'       TEST FOR 1ST ADDR OF FET 2
   2922 9C35             2923 3436        DC    XL2'9C35'    2D  BOC,3            BR TO ADDR 35 IF SO
   2924 E00E             2925 3437        DC    XL2'E00E'    2E  CI 0,X'0E'       TEST FOR 4TH QUAD OF FET 2
   2926 9C38             2927 3438        DC    XL2'9C38'    2F  BOC,3            BR TO ADDR 38 IF SO
   2928 E010             2929 3439        DC    XL2'E010'    30  CI 0,X'10'       TEST FOR 1ST ADDR OF FET 3
   292A 9C3C             292B 3440        DC    XL2'9C3C'    31  BOC,3            BR TO ADDR 3C IF SO
   292C E018             292D 3441        DC    XL2'E018'    32  CI 0,X'18'       MAXIMUM ADDRESS?
   292E 9C3E             292F 3442        DC    XL2'9C3E'    33  BOC,3            TO END AT ADDR 03E.
   2930 5023             2931 3443        DC    XL2'5023'    34  BOS,0            BR TO ADDR 23 TO DATA INC
   2932 F301             2933 3444        DC    XL2'F301'    35  TBN 3,X'01'      TEST FOR FET 2 INST FLAG
   2934 9C23             2935 3445        DC    XL2'9C23'    36  BOC,3            TO ADR 23, DATA INC, IF SO
   2936 503E             2937 3446        DC    XL2'503E'    37  BOS,0            OTHERWISE BR TO 3E, END.
   2938 F302             2939 3447        DC    XL2'F302'    38  TBN 3,X'02'      TEST FOR FET 3 INST FLAG
   293A 9C23             293B 3448        DC    XL2'9C23'    39  BOC,3            TO ADR 23, DATA INC, IF SO
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   293C 7415             293D 3449        DC    XL2'7415'    3A  IC 4,X'15'    CHANGE EXP.DATA TO 15
   293E 5023             293F 3450        DC    XL2'5023'    3B  BOS,0          TO ADR 23. DATA INC
   2940 F302             2941 3451        DC    XL2'F302'    3C  TBN 3,X'02'    TEST FOR FET 3 INST FLAG
   2942 9C23             2943 3452        DC    XL2'9C23'    3D  BOC,3          TO ADR 23. DATA INC. IF SO
   2944 503E             2945 3453 R17MCE DC    XL2'503E'    3E  BOS,0          HANG. EXPECTED RESULTS
                              3454
                              3455 ********************************************************************
                              3456 * ROUTINE 22 MBAR INTERACTION                                      *
                              3457 ********************************************************************
                              3458 *  MACRO-1. LIO HDB 00/01=0000                                     *
                              3459 *                                                                  *
                              3460 *  MICRO-1. MBAR TO CURAR STROBE.                                  *
                              3461 *           INSURE MBAR=CURAR.                                     *
                              3462 *           WRITE HEX 'FF' TO ALL HDB'S THAT ARE 'ONE-ADDR-BIT' AWAY. *
                              3463 *           INSURE MBAR STILL EQUAL CURAR.                         *
                              3464 *                                                                  *
                              3465 *  MACRO-2  LIO TO ALL HDB'S THAT ARE 'ONE-ADDR-BIT'AWAY WITH      *
                              3466 *           DATA OF FFFF.                                          *
                              3467 *  MICRO-2  INSURE MBAR STILL EQUAL CURAR.                         *
                              3468 *                                                                  *
                              3469 ********************************************************************
   2946 22               2946 3470 RT22   DC    XL1'22'                    ROUTINE NO.
   2947 00               2947 3471        DC    XL1'00'
   2948 2A49             2949 3472        DC    AL2(RT23)
                              3473
   294A C0 87 021A            3474        B     PRINT                      PRINT ROUTINE HEADING.
   294E 01               294E 3475        DC    XL1'01'
   294F 18               294F 3476        DC    IL1'24'
   2950 296D             2951 3477        DC    AL2(R42HDR)
   2952 C0 87 296E            3478        B     DORT42
   2956 D9D6E4E34CF2F240 296D 3479 R42HDR DC    CL24'ROUT 22 MBAR INTERACTION'
   295E D4C2C1D940C9D5E3
   2966 C5D9C1C3E3C9D5C5
   296E C0 87 5918            3480 DORT42 B     LOADCS                     LOAD MICROCODE 1.
   2972 8F               2972 3481        DC    XL1'8F'                    FILL WITH BOS-TO-ADDR
   2973 29FB             2974 3482        DC    AL2(R42NCS)
   2975 2A42             2976 3483        DC    AL2(R42MCE)
   2977 F3 58 80              3484        SIO   X'80',SIOI                 DISABLE RESET
   297A 31 48 0D62            3485        LIO   ZERO,HDB0                  MBAR & HDB 00/01=ZERO
   297E C0 87 54FE            3486        B     DOMICR                     GO DO MICROCODE 1.
   2982 70               2982 3487        DC    XL1'70'                    ERROR HALT 70.
   2983 5023             2984 3488        DC    XL2'5023'                  EXPECTED RESULTS
                              3489
                              3490 * START MACRO-2.
   2985 F3 58 80              3491        SIO   X'80',SIOI                 DISABLE RESET
   2988 31 49 0D59            3492        LIO   XFFFF,HDB1                 HDB 02/03=FFFF
   298C 31 4A 0D59            3493        LIO   XFFFF,HDB2                 HDB 04/05=FFFF
   2990 31 4B 0D59            3494        LIO   XFFFF,HDB3                 HDB 06/07=FFFF
   2994 31 4C 0D59            3495        LIO   XFFFF,HDB4                 HDB 08/09=FFFF
   2998 31 4D 0D59            3496        LIO   XFFFF,HDB5                 HDB 0A/0B=FFFF
   299C 31 4E 0D59            3497        LIO   XFFFF,HDB6                 HDB 0C/0D=FFFF
   29A0 31 4F 0D59            3498        LIO   XFFFF,HDB7                 HDB 0E/0F=FFFF
   29A4 F3 58 C0              3499        SIO   X'C0',SIOI                 ENABLE ATTACHMENT
   29A7 31 48 0D59            3500        LIO   XFFFF,HDB0                 HDB 10/11=FFFF
   29AB 31 49 0D59            3501        LIO   XFFFF,HDB1                 HDB 12/13=FFFF
   29AF 31 4A 0D59            3502        LIO   XFFFF,HDB2                 HDB 14/15=FFFF
   29B3 31 4B 0D59            3503        LIO   XFFFF,HDB3                 HDB 16/17=FFFF
   29B7 31 4C 0D59            3504        LIO   XFFFF,HDB4                 HDB 18/19=FFFF
   29BB 31 4D 0D59            3505        LIO   XFFFF,HDB5                 HDB 1A/1B=FFFF
   29BF 31 4E 0D59            3506        LIO   XFFFF,HDB6                 HDB 1C/1D=FFFF
   29C3 31 4F 0D59            3507        LIO   XFFFF,HDB7                 HDB 1E/1F=FFFF
   29C7 31 88 0D59            3508        LIO   XFFFF,X'88'                LOAD
   29CB 31 89 0D59            3509        LIO   XFFFF,X'89'                 MI
   29CF 31 8A 0D59            3510        LIO   XFFFF,X'8A'                  HDB'S
   29D3 31 8B 0D59            3511        LIO   XFFFF,X'8B'                   TO
   29D7 31 8C 0D59            3512        LIO   XFFFF,X'8C'                    FFFF
   29DB 31 8D 0D59            3513        LIO   XFFFF,X'8D'
   29DF 31 8E 0D59            3514        LIO   XFFFF,X'8E'
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ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

   29E3 31 8F 0059          3515        LIO   XFFFF,X'8F'
   29E7 C0 87 5918          3516 R42MI2 B     LOADCS                  GO LOAD MICROCODE 2.
   29EB 8F                  29E8 3517   DC    XL1'8F'
   29EC 2A43                29ED 3518   DC    AL2(R42MC1)
   29EE 2A48                29EF 3519   DC    AL2(R42MC2)
   29F0 C0 87 54FE          3520        B     DOMICR                  GO DO MICROCODE 2
   29F4 71                  29F4 3521   DC    XL1'71'                 ERROR HALT
   29F5 5002                29F6 3522   DC    XL2'5002'               EXPECTED RESULTS
   29F7 C0 87 0216          3523        B     LINK
                            3524
                            3525 * START OF MICROCODE 1.
                            3526 *-----------------------------*
                            3527 * START OF MICROPROGRAM LISTING *
                            3528 *-----------------------------*
                            29FB 3529 R42MCS EQU   *
   29FB 1704                29FC 3530   DC    XL2'1704'   000  SSN A   MBAR TO CURAR STROBE
   29FD 5403                29FE 3531   DC    XL2'5403'   001  BOS.1   TO ADDR 003 IF MBAR=CURAR
   29FF 5002                2A00 3532   DC    XL2'5002'   002  BOS.0   ERROR. HANG
   2A01 72FF                2A02 3533   DC    XL2'72FF'   003  IC 2,X'FF'
   2A03 73FF                2A04 3534   DC    XL2'73FF'   004  IC 3,X'FF'
   2A05 74FF                2A06 3535   DC    XL2'74FF'   005  IC 4,X'FF'
   2A07 75FF                2A08 3536   DC    XL2'75FF'   006  IC 5,X'FF'
   2A09 78FF                2A0A 3537   DC    XL2'78FF'   007  IC 8,X'FF'
   2A0B 79FF                2A0C 3538   DC    XL2'79FF'   008  IC 9,X'FF'
   2A0D 2029                2A0E 3539   DC    XL2'2029'   009  LR 10,09
   2A0F 2129                2A10 3540   DC    XL2'2129'   00A  LR 11,09
   2A11 2229                2A12 3541   DC    XL2'2229'   00B  LR 12,09
   2A13 2329                2A14 3542   DC    XL2'2329'   00C  LR 13,09
   2A15 2429                2A16 3543   DC    XL2'2429'   00D  LR 14,09
   2A17 2529                2A18 3544   DC    XL2'2529'   00E  LR 15,09
   2A19 2829                2A1A 3545   DC    XL2'2829'   00F  LR 18,09
   2A1B 2929                2A1C 3546   DC    XL2'2929'   010  LR 19,09
   2A1D 2089                2A1E 3547   DC    XL2'2089'   011  LR 20,09
   2A1F 2189                2A20 3548   DC    XL2'2189'   012  LR 21,09
   2A21 2289                2A22 3549   DC    XL2'2289'   013  LR 22,09
   2A23 2389                2A24 3550   DC    XL2'2389'   014  LR 23,09
   2A25 2489                2A26 3551   DC    XL2'2489'   015  LR 24,09
   2A27 2589                2A28 3552   DC    XL2'2589'   016  LR 25,09
   2A29 2889                2A2A 3553   DC    XL2'2889'   017  LR 28,09
   2A2B 2989                2A2C 3554   DC    XL2'2989'   018  LR 29,09
   2A2D 20A9                2A2E 3555   DC    XL2'20A9'   019  LR 30,09
   2A2F 21A9                2A30 3556   DC    XL2'21A9'   01A  LR 31,09
   2A31 22A9                2A32 3557   DC    XL2'22A9'   01B  LR 32,09
   2A33 23A9                2A34 3558   DC    XL2'23A9'   01C  LR 33,09
   2A35 24A9                2A36 3559   DC    XL2'24A9'   01D  LR 34,09
   2A37 25A9                2A38 3560   DC    XL2'25A9'   01E  LR 35,09
   2A39 28A9                2A3A 3561   DC    XL2'28A9'   01F  LR 38,09
   2A3B 29A9                2A3C 3562   DC    XL2'29A9'   020  LR 39,09
   2A3D 5423                2A3E 3563   DC    XL2'5423'   021  BOS,1   TO ADDR 023 IF MBAR=CURAR
   2A3F 5022                2A40 3564   DC    XL2'5022'   022  BOS,0   ERROR, HANG
   2A41 5023                2A42 3565 R42MCE DC    XL2'5023'   023  BOS,0   EXPECTED RESULTS
                            3566
                            3567 *-----------------------------*
                            3568 * START OF MICROPROGRAM LISTING *
                            3569 *-----------------------------*
                            2A43 3570 R42MC1 EQU   *
   2A43 5402                2A44 3571   DC    XL2'5402'   000  BOS,1   TO ADDR 002 IF MBAR=CURAR
   2A45 5001                2A46 3572   DC    XL2'5001'   001  BOS,0   ERROR, HANG
   2A47 5002                2A48 3573 R42MC2 DC    XL2'5002'   002  BOS,0   EXPECTED RESULTS
                            3574
                            3575 ********************************************************************************
                            3576 *      ROUTINE 23 - ATTACHMENT CHECK TESTS                                     *
                            3577 ********************************************************************************
                            3578 *                                                                              *
                            3579 *      THIS ROUTINE TESTS THAT ALL DIFFERENT TYPES OF ATTACHMENT               *
                            3580 *      CHECKS CAN BE DETECTED.  IT DOES THIS BY USING DIAG. LATCH 2            *
                            3581 *      WHICH CAN BLOCK THE PARITY BIT.                                         *
                            3582 *                                                                              *
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ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

                            3583 ********************************************************************************
                            3584
   2A49 23                  2A49 3585 RT23  DC    XL1'23'                 ROUTINE NUMBER
   2A4A 00                  2A4A 3586       DC    XL1'0'                  NO MANUAL INTERVENTION
   2A4B 2B80                2A4C 3587       DC    AL2(RT24)               ADDRESS OF NEXT ROUTINE
                            3588
   2A4D C0 87 021A          3589        B     PRINT                   PRINT ROUTINE HEADING
   2A51 01                  2A51 3590       DC    XL1'01'
   2A52 18                  2A52 3591       DC    IL1'24'
   2A53 2B7F                2A54 3592       DC    AL2(RT18CP)
                            3593
   2A55 C0 87 5918          3594        B     LOADCS                  ,GO PUT BOS 0,ADDR IN CTRL STORE
   2A59 01                  2A59 3595       DC    XL1'01'                  1ST 256 WORDS
   2A5A F3 58 84            3596        SIO   X'84',SIOI              ,DISABLE & SET DIAG 2 LATCH
   2A5D 31 59 5D8D          3597        LIO   X2205,OPDEC             ,LOAD OP DECODE WITH BAD PARITY
   2A61 F3 58 80            3598        SIO   X'80',SICI              ,DISABLE ATTACHMENT
   2A64 F3 58 E0            3599        SIO   X'E0',SIOI              ,ENABLE MICRO CONTROLLER
   2A67 C0 87 61E6          3600        B     TSTCHK                  ,OP DECODE CHECK SHOULD BE
   2A6B 80                  2A6B 3601       DC    XL1'80'                  PENDING
   2A6C 5D                  2A6C 3602       DC    XL1'5D'                 ,ERROR HALT  -5D-
   2A6D C0 87 5D38          3603        B     LOOP                    ,GO RESTORE OP DECODE REGS.
                            3604
   2A71 F3 58 84            3605        SIO   X'84',SIOI              ,DISABLE & SET DIAG 2 LATCH
   2A74 31 59 5D6D          3606        LIO   X1415,OPDEC             ,PUT BAD PARITY IN OP DECODE
   2A78 F3 58 80            3607        SIO   X'80',SIOI              ,DISABLE
   2A7B F3 58 E0            3608        SIO   X'E0',SIOI              ,ENABLE MICROCONTROLLER
   2A7E C0 87 61E6          3609        B     TSTCHK                  ,OP DECODE CHECK SHOULD BE
   2A82 80                  2A82 3610       DC    XL1'80'                  PENDING
   2A83 58                  2A83 3611       DC    XL1'58'                 ,ERROR HALT  -58-
   2A84 C0 87 5D38          3612        B     LOOP                    ,GO RESTORE OP DECODE REGS
                            3613
   2A88 F3 58 84            3614        SIO   X'84',SICI              ,DISABLE & SET DIAG 2 LATCH
   2A8B 31 4A 0D56          3615        LIO   XAA55,MDB2              ,PUT BAD PARITY IN MDB 4-5
                            3616
   2A8F F3 58 80            3617        SIO   X'80',SIOI              ,RESET ATTACHMENT
   2A92 30 4A 5FE6          3618        SNS   STATAC,MDB2             ,CAUSE ATTACHMENT CHECK
   2A96 C0 87 61E6          3619        B     TSTCHK                  ,MDB/EXT PARITY CHECK
   2A9A 88                  2A9A 3620       DC    XL1'88'                  SHOULD BE PENDING
   2A9B 5A                  2A9B 3621       DC    XL1'5A'                 ,ERROR HALT  -5A-
                            3622
   2A9C F3 58 C0            3623        SIO   X'C0',SIOI              ,ENABLE ATTACHMENT
   2A9F 31 58 2B5F          3624        LIO   X2204,CTSTOR            ,LOAD 1ST WD = LR MDB 4 TO 2
   2AA3 F3 58 80            3625        SIO   X'80',SIOI              ,DISABLE ATTACHMENT
   2AA6 C0 87 54FE          3626        B     DOMICR                  ,GO DO PRG
   2AAA 5E                  2AAA 3627       DC    XL1'5E'                 ,ERROR HALT  -5E-
   2AAB 5001                2AAC 3628       DC    XL2'5001'               ,EXPECTED RESULT
   2AAD C0 87 61E6          3629        B     TSTCHK                  ,MDB CHECK SHOULD BE PENDING
   2AB1 88                  2AB1 3630       DC    XL1'88'                  FROM BAD PARITY ON A REG.
   2AB2 5F                  2AB2 3631       DC    XL1'5F'                 ,ERROR HALT  -5F-
                            3632
   2AB3 F3 58 C0            3633        SIO   X'C0',SIOI              ,ENABLE ATTACHMENT
   2AB6 31 58 2B61          3634        LIO   X2503,CTSTOR            ,LOAD 1ST WD = LR 3 TO 5
   2ABA F3 58 80            3635        SIO   X'80',SIOI              ,DISABLE ATTACHMENT
   2ABD C0 87 54FE          3636        B     DOMICR                  ,GO DO PRG.
   2AC1 60                  2AC1 3637       DC    XL1'60'                 ,EPROR HALT  -60-
   2AC2 5001                2AC3 3638       DC    XL2'5001'               ,EXPECTED RESULT
   2AC4 C0 87 61E6          3639        B     TSTCHK                  ,MDB CHECK SHOULD BE PENDING
   2AC8 86                  2AC8 3640       DC    XL1'86'                  FROM BAD PARITY ON B REG.
   2AC9 61                  2AC9 3641       DC    XL1'61'                 ,ERROR HALT  -61-
   2ACA 31 49 0D56          3642        LIO   XAA55,MDB1              ,PUT GOOD PARITY IN MDB 2-3
   2ACE 31 4A 0D56          3643        LIO   XAA55,MDB2              ,PUT GOOD PARITY IN MDB 4-5
                            3644
   2AD2 F3 58 84            3645        SIO   X'84',SIOI              ,DISABLE & SET DIAG 2 ON
   2AD5 31 48 3198          3646        LIO   X0155,MDB0              ,PUT BAD PARITY IN MBAR LO
   2AD9 F3 58 E0            3647        SIO   X'E0',SIOI              ,ENABLE M.C. & RESET DIAG 2
   2ADC C0 87 61E6          3648        B     TSTCHK                  ,CONTROL STORE ADDR. CHECK
   2AE0 81                  2AE0 3649       DC    XL1'81'                  SHOULD BE PENDING
   2AE1 62                  2AE1 3650       DC    XL1'62'                 ,ERROR HALT  -62-
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3651
 2AE2 F3 58 84           3652        SIO   X'84',SIOI          .DISABLE & SET DIAG 2
 2AE5 31 48 5A08         3653        LIO   WUN,HDB0            .PUT BAD PARITY IN MBAR HI
 2AE9 F3 58 E0           3654        SIO   X'E0',SIOI          .ENABLE MC. &RESET DIAG 2
 2AEC C0 87 61E6         3655        B     TSTCHK              .CONTROL STORE ADDR. CHECK
 2AF0 81                 2AF0 3656   DC    XL1'81'             SHOULD BE PENDING
 2AF1 68                 2AF1 3657   DC    XL1'68'             .ERROR HALT  -68-
 2AF2 31 48 0D58         3658        LIO   X0202,HDB0          .PUT GOOD PARITY IN MBAR
                         3659
 2AF6 F3 58 E4           3660        SIO   X'E4',SIOI          .ENABLE M.C. WITH DIAG 2 ON
 2AF9 C0 87 61E6         3661        B     TSTCHK              .CONTROL STORE ADDR CHECK
 2AFD 81                 2AFD 3662   DC    XL1'81'             SHOULD BE PENDING
 2AFE 68                 2AFE 3663   DC    XL1'68'             .ERROR HALT  -68-
                         3664
 2AFF C0 87 5918         3665        B     LOADCS              .GO PUT BOS.0 ADDR IN CONT. STG.
 2B03 01                 2B03 3666   DC    XL1'01'
                         3667
 2B04 F3 58 C0           3668        SIO   X'C0',SIOI          .ENABLE ATTACHMENT
 2B07 30 58 5FE6         3669        SNS   STATAC,CTSTOR       .INCREMENT MIAR
 2B0B 31 58 2B67         3670        LIO   X0584,CTSTOR        .LOAD WORD IN CONT. STORE
 2B0F F3 58 80           3671        SIO   X'80',SIOI          .DISABLE ATTACHMENT
 2B12 F3 58 C0           3672        SIO   X'C0',SIOI          .ENABLE ATTACHMENT
 2B15 30 58 5FE6         3673        SNS   STATAC,CTSTOR       .INCREMENT MIAR
 2B19 F3 58 E4           3674        SIO   X'E4',SIOI          .ENABLE M.C. & SET DIAG 2
                         3675 *                                PROG. WILL LR FROM HDB 4 TO
                         3676 *                                M.B. WITH BAD PARITY
 2B1C C0 87 61E6         3677        B     TSTCHK              .CONT. STORE WRITE DATA CHECK
 2B20 82                 2B20 3678   DC    XL1'82'             SHOULD BE PENDING
 2B21 6D                 2B21 3679   DC    XL1'6D'             .ERROR HALT  -6D-
                         3680
 2B22 F3 58 C0           3681        SIO   X'C0',SIOI          .ENABLE ATTACHMENT
 2B25 30 58 5FE6         3682        SNS   STATAC,CTSTOR       .INCREMENT MIAR
 2B29 F3 58 E0           3683        SIO   X'E0',SIOI          .ENABLE M.C. RESTORE GOOD DATA
 2B2C F3 58 80           3684        SIO   X'80',SIOI          .DISABLE ATTACHMENT
                         3685
 2B2F F3 58 C4           3686        SIO   X'C4',SIOI          .ENABLE WITH DIAG 2 ON
 2B32 31 58 2B63         3687        LIO   XE101,CTSTOR        .WRITE BAD PARITY EVEN BYTE
 2B36 F3 58 80           3688        SIO   X'80',SIOI          .DISABLE
 2B39 F3 58 E0           3689        SIO   X'E0',SIOI          .ENABLE M.C.
 2B3C C0 87 61E6         3690        B     TSTCHK              .C.S. DATA CHECK SHOULD BE
 2B40 84                 2B40 3691   DC    XL1'84'             PENDING
 2B41 74                 2B41 3692   DC    XL1'74'             .ERROR HALT  -74-
                         3693
 2B42 F3 58 C4           3694        SIO   X'C4',SIOI          .ENABLE WITH DIAG 2 ON
 2B45 31 58 2B65         3695        LIO   XE003,CTSTOR        .WRITE BAD PARITY ODD BYTE
 2B49 F3 58 80           3696        SIO   X'80',SIOI          .DISABLE
 2B4C F3 58 E0           3697        SIO   X'E0',SIOI          .ENABLE M.C.
 2B4F C0 87 61E6         3698        B     TSTCHK              .C. S. DATA AND HDB/EXT CHECKS
 2B53 8C                 2B53 3699   DC    XL1'8C'             SHOULD BE PENDING
 2B54 7B                 2B54 3700   DC    XL1'7B'             .ERROR HALT  -7B-
 2B55 C0 87 5918         3701        B     LOADCS              .GO PUT GOOD PARITY IN C.S.
 2B59 01                 2B59 3702   DC    XL1'01'
 2B5A C0 87 0216         3703        B     LINK                .GO TO NEXT ROUTINE
                         3704
 2B5E 2204               2B5F 3705 X2204   DC    XL2'2204'
 2B60 2503               2B61 3706 X2503   DC    XL2'2503'
 2B62 E101               2B63 3707 XE101   DC    XL2'E101'
 2B64 E003               2B65 3708 XE003   DC    XL2'E003'
 2B66 0584               2B67 3709 X0584   DC    XL2'0584'
 2B68 D9D6E4E340F2F340   2B7F 3710 RT18OP  DC    CL24'ROUT 23 ATTACHMENT CHECK'
 2B70 C1E3E3C1C3C8D4C5
 2B78 D5E340C3C8C5C3D2
                         3710
                         3711 ********************************************************************************
                         3712 *      ROUTINE 24 - CONTROL STORE SCAN                                         *
                         3713 ********************************************************************************
                         3714 *                                                                              *
                         3715 *      THIS ROUTINE WILL EXCERCISE ALL OF CONTROL STORAGE INCLUDING            *
                         3716 *      THAT PART WHICH IS USED AS THE MESSAGE BUFFER.                          *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3717 *      IT DOES THIS BY PUTTING INCREMENTING DATA IN EACH BYTE.  256    *
                         3718 *      PASSES ARE MADE SO THAT EACH BYTE WILL HAVE ALL COMBINATIONS    *
                         3719 *      OF DATA IN IT.  THE DATA IS WRITTEN AND READ AND CHECKED USING  *
                         3720 *      MBAR AND MICROPROGRAM TO ADDRESS EACH BYTE.                     *
                         3721 *      THE ROUTINE IS DONE IN TWO PHASES.  IN THE FIRST PHASE, THE     *
                         3722 *      MICROCODE IS LOADED IN THE 3RD 256 WORDS AND THE FIRST 1024     *
                         3723 *      BYTES ARE EXCERCISED.  THEN THE MICROCODE IS LOADED IN THE      *
                         3724 *      FIRST 256 WORDS AND THE 2ND 1024 BYTES ARE EXCERCISED.          *
                         3725 *      IN A MACHINE WITH 2 STGS, THERE ARE 4 PHASES DONE TO TEST       *
                         3726 *      BOTH STGS.  IN THE FIRST TWO PHASES, THE MICROCODE IS IN THE    *
                         3727 *      2ND STG AND THE 1ST STG IS TESTED.  ERRORS IN THE 1ST STG ARE   *
                         3728 *      DENOTED BY HALT -8B-.  IN THE NEXT TWO PHASES, THE MICROCODE    *
                         3729 *      IS IN THE 1ST STG AND THE 2ND STG IS TESTED.  ERRORS IN THE     *
                         3730 *      2ND STG ARE DENOTED BY HALT -8C-.                               *
                         3731 *                                                                      *
                         3732 ************************************************************************
                         3733
 2B80 24                 2B80 3734 RT24    DC    XL1'24'             ROUTINE NUMBER
 2B81 00                 2B81 3735         DC    XL1'00'             NO MANUAL INTERVENTION
 2B82 2DC7               2B83 3736         DC    AL2(RT25)           ADDRESS OF NEXT ROUTINE
                         3737
 2B84 C0 87 021A         3738         B     PRINT               .PRINT ROUTINE MESSAGE
 2B88 01                 2B88 3739         DC    XL1'01'
 2B89 31                 2B89 3740         DC    IL1'49'
 2B8A 2D8A               2B8B 3741         DC    AL2(RT2DCP)
                         3742
 2B8C 38 08 020B         3743         TBN   SBYTE3,SSW1C        .TEST SSW 1C ON
 2B90 C0 10 0216         3744         BT    LINK                .IF SO, SKIP THIS ROUTINE
 2B94 3B 01 020A         3745         SBF   SBYTE2,SSW17        .RESET SENSE SWITCH 17
                         3746 *
                         3747 * BEGIN TESTING LO HALF OF FIRST STORAGE WITH
                         3748 * THE MICROPROGRAM RUNNING IN THE HI HALF
 2B98 C0 87 5918         3749 RT19ST B     LOADCS              .GO LOAD 1ST 256 WORDS WITH A
 2B9C 91                 2B9C 3750 RT19M1  DC    XL1'91'              WITH A BRANCH TO 3RD 256
 2B9D 2D04               2B9E 3751         DC    AL2(R2DNCS)
 2B9F 2D05               2BA0 3752         DC    AL2(R2DNCE)
 2BA1 C0 87 5918         3753         B     LOADCS              .GO PUT BOS TO ADDR. IN THE
 2BA5 32                 2BA5 3754         DC    XL1'32'              2ND 256 WORDS
 2BA6 C0 87 5918         3755         B     LOADCS              .GO PUT PROGRAM IN 3RD 256 WDS.
 2BAA A4                 2BAA 3756         DC    XL1'A4'
 2BAB 2D06               2BAC 3757         DC    AL2(R2DMC1)
 2BAD 2D43               2BAE 3758         DC    AL2(R2DMC2)
                         3759
 2BAF 3A 01 554D         3760         SBN   EMBP,X'01'          .SET ERROR HALT BYPASS ON
 2BB3 3C 1A 5563         3761         MVI   LPCNT-1,X'1A'       .EXTEND LOOP COUNT
 2BB7 F3 58 C0           3762         SIO   X'C0',SIOI          ENABLE ATTACHMENT
 2BBA 31 4A 2DBC         3763         LIO   X0000,HDB2          PROVIDE START ADDR
 2BBE 31 4B 56F4         3764         LIO   X0400,HDB3          PROVIDE END ADDR
 2BC2 C0 87 54FE         3765         B     DOMICR              .GO DO MICROPROGRAM
 2BC6 8B                 2BC6 3766 RT19M5  DC    XL1'8B'             .ERROR HALT  -8B-  OR  -8C-
 2BC7 521E               2BC8 3767 R2DEX1  DC    XL2'521E'           .EXPECTED RESULT
                         3768
 2BC9 0D 01 5FE6 2BC8    3769         CLC   STATAC(2),R2DEX1    .TEST FOR ERROR
 2BCF C0 01 27BA         3770         BNE   R17PO               .PRINT OUT IF ERROR
                         3771
                         3772 *
                         3773 * BEGIN TESTING HI HALF OF FIRST STORAGE WITH
                         3774 * THE MICROPROGRAM RUNNING IN THE LOW HALF.
 2BD3 C0 87 5918         3775         B     LOADCS              .LOAD 2ND MICROPROGRAM
 2BD7 83                 2BD7 3776 RT19N6  DC    XL1'83'
 2BD8 2D44               2BD9 3777         DC    AL2(R2DMC3)
 2BDA 2D81               2BDB 3778         DC    AL2(R2DMC4)
                         3779
 2BDC 3A 01 554D         3780         SBN   EMBP,X'01'          .SET ERROR HALT BYPASS ON
 2BE0 3C 1A 5563         3781         MVI   LPCNT-1,X'1A'       .EXTEND LOOP COUNT
 2BE4 F3 58 C0           3782         SIO   X'C0',SIOI          ENABLE ATTACHMENT
 2BE7 31 4A 56F4         3783         LIO   X0400,HDB2          PROVIDE START ADDR
 2BEB 31 4B 2DBE         3784         LIO   X0800,HDB3          PROVIDE END ADDR
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    2BEF C0 87 54FE            3785            B      COMICR                    .GO DO 2ND MICROPROGRAM
    2BF3 8B               2BF3 3786 RT19M7 DC     XL1'8B'                   .ERROR HALT  -8B-  OR  -8C-
    2BF4 501E             2BF5 3787 R2DEX2 DC     XL2'501E'                 .EXPECTED RESULT
    2BF6 0D 01 5FE6 2BF5       3788            CLC    STATAC(2).R2DEX2          .TEST FOR ERROR
    2BFC C0 01 278A            3789            BNE    R17PO                     .PRINT OUT IF ERROR
                               3790
                               3791 *
                               3792 * BEGIN TESTING LOW HALF OF 2ND FET WITH
                               3793 * MICROPROGRAM RUNNING IN HIGH HALF.
    2C00 C0 87 5918            3794            B      LOADCS                    GO LOAD ADR 000 WITH BAL TO
    2C04 9F               2C04 3795            DC     XL1'9F'                   0600 AND FILL WITH
    2C05 2D82             2C06 3796            DC     AL2(R2DMC5)               BOS-TO-ADDR THRU 03FF
    2C07 2D83             2C08 3797            DC     AL2(R2DMC6)
    2C09 C0 87 5918            3798            B      LOADCS                    GO LOAD ADR 400 TO 05FF WITH
    2C0D F3               2C0D 3799            DC     XL1'F3'                   BOS-TO-ADDRESS.
    2C0E 2D82             2C0F 3800            DC     AL2(R2DMC5)
    2C10 2D83             2C11 3801            DC     AL2(R2DMC6)
    2C12 20               2C12 3802            DC     XL1'20'
    2C13 C0 87 5918            3803            B      LOADCS                    GO LOAD ADR 0600 WITH FIRST
    2C17 EF               2C17 3804            DC     XL1'EF'                   PROGRAM AND FILL REST OF STG
    2C18 2D06             2C19 3805            DC     AL2(R2DMC1)               BOS-70-ADDR.
    2C1A 2D43             2C1B 3806            DC     AL2(R2DMC2)
    2C1C 20               2C1C 3807            DC     XL1'20'
    2C1D 3A 01 554D            3808 CONTUE SBN    EHBP.X'01'                SET ERROR-HALT-BY PASS ON
    2C21 3C 1A 5563            3809            MVI    LPCNT-1.X'1A'             EXTEND LOOP COUNT
    2C25 F3 58 C0              3810            SIO    X'C0'.SIOI                ENABLE ATTACHMENT
    2C28 31 4A 2DBE            3811            LIO    X0800.HDB2                PROVIDE START ADDR
    2C2C 31 4B 2DC0            3812            LIO    X0C00.HDB3                PROVIDE END ADDR
    2C30 C0 87 54FE            3813            B      DOMICR                    GO DO MICROPROGRAM
    2C34 8C               2C34 3814            DC     XL1'8C'                    ERROR HALT
    2C35 521E             2C36 3815            DC     XL2'521E'                  EXPECTED RESULTS
                               3816
    2C37 0D 01 5FE6 2BC8       3817            CLC    STATAC(2).R2DEX1          TEST FOR ERROR
    2C3D C0 01 278A            3818            BNE    R17PO                     PRINT OUT IF ERROR
                               3819 *
                               3820 * BEGIN TESTING HIGH HALF OF 2ND FET WITH
                               3821 * MICROPROGRAMMING RUNNING IN LOW HALF.
    2C41 C0 87 5918            3822            B      LOADCS                    GO LOAD ADR 000 WITH BAL TO
    2C45 9F               2C45 3823            DC     XL1'9F'                   0400 AND
    2C46 2D84             2C47 3824            DC     AL2(R2DMC7)               FILL WITH BCS-TO-ADDR
    2C48 2D85             2C49 3825            DC     AL2(R2DMC8)               THRU 03FF
    2C4A C0 87 5918            3826            B      LOADCS                    GO LOAD 2ND MICROPROGRAM AT
    2C4E EF               2C4E 3827            DC     XL1'EF'                   ADDRESS 0400 AND FILL WITH
    2C4F 2D44             2C50 3828            DC     AL2(R2DMC3)               BOS-TO-ADDR
    2C51 2D81             2C52 3829            DC     AL2(R2DMC4)
    2C53 20               2C53 3830            DC     XL1'20'
                               3831
    2C54 3A 01 554D            3832            SBN    EHBP.X'01'                SET ERROR-HALT-BYPASS ON.
    2C58 3C 1A 5563            3833            MVI    LPCNT-1.X'1A'             EXTEND LOOP COUNT.
    2C5C F3 58 C0              3834            SIO    X'C0'.SIOI                ENABLE ATTACHMENT
    2C5F 31 4A 2DC0            3835            LIO    X0C00.HDB2                PROVIDE START ADDR
    2C63 31 4B 2DC2            3836            LIO    X1000.HDB3                PROVIDE END ADDR
    2C67 C0 87 54FE            3837            B      DOMICR                    GO DO MICROPROGRAM
    2C6B 8C               2C6B 3838            DC     XL1'8C'                   ERROR HALT
    2C6C 501E             2C6D 3839            DC     XL2'501E'                 EXPECTED RESULTS
                               3840
    2C6E 0D 01 5FE6 2BF5       3841            CLC    STATAC(2).R2DEX2          TEST FOR ERROR
    2C74 C0 01 278A            3842            BNE    R17PO                     PRINT OUT IF ERROR
                               3843 *
                               3844 * TEST FOR 3RD FET INSTALLED. IF NCT. END ROUTINE. IF SO,
                               3845 *
                               3846 * BEGIN TESTING OF LOW HALF OF 3RD FET WITH
                               3847 * MICROPROGRAM RUNNING IN HIGH HALF.
    2C78 38 02 0A0C            3848            TBN    UDT2.X'02'                TEST FOR 3RD FET INSTALLED
    2C7C C0 90 0216            3849            BF     LINK                      OUT IF NOT
    2C80 C0 87 5918            3850            B      LOADCS                    GO COAD ADDR 000 WITH BAL TO
    2C84 9F               2C84 3851            DC     XL1'9F'                   0A00
    2C85 2D86             2C86 3852            DC     AL2(R2DMC9)               AND FILL WITH BCS-TO-ADDR
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    2C87 2D87             2C88 3853            DC     AL2(R2DMCA)               THRU 03FF
    2C89 C0 87 5918            3854            B      LOADCS                    FILL 0400 THRU 07FF WITH
    2C8D 7F               2C8D 3855            DC     XL1'7F'                    BOS-70-ADDR.
    2C8E 20               2C8E 3856            DC     XL1'20'
    2C8F C0 87 5918            3857            B      LOADCS                    FILL 0800 THRU 09FF WITH
    2C93 73               2C93 3858            DC     XL1'73'                    BCS TO ADDR
    2C94 40               2C94 3859            DC     XL1'40'
    2C95 C0 87 5918            3860            B      LOADCS                    LOAD 1ST MICROPROGRAM AT 0A00
    2C99 EC               2C99 3861            DC     XL1'EC'                   FILL THE REST OF CS WITH
    2C9A 2D06             2C9B 3862            DC     AL2(R2DMC1)               BOS-TO-ADDR
    2C9C 2D43             2C9D 3863            DC     AL2(R2DMC2)
    2C9E 40               2C9E 3864            DC     XL1'40'
                               3865
    2C9F 3A 01 554D            3866            SBN    EHBP.X'01'                SET ERROR-HALT-BYPASS ON
    2CA3 3C 1A 5563            3867            MVI    LPCNT-1.X'1A'             EXTEND LOOP COUNT
    2CA7 F3 58 C0              3868            SIO    X'C0'.SIOI                ENABLE ATTACHMENT
    2CAA 31 4A 2DC2            3869            LIO    X1000.HDE2                PROVIDE START ADDR
    2CAE 31 4B 2DC4            3870            LIO    X1400.HDB3                PROVIDE END ADDR
    2CB2 C0 87 54FE            3871            B      DOMICR                    GO DO MICRO
    2CB6 8D               2CB6 3872            DC     XL1'8D'                   ERROR HALT
    2CB7 521E             2CB8 3873            DC     XL2'521E'                 EXPECTED RESULTS
                               3874
    2CB9 0D 01 5FE6 2BC8       3875            CLC    STATAC(2).R2DEX1          TEST FOR ERROR
    2CBF C0 01 278A            3876            BNE    R17PO                     PRINT OUT IF ERROR
                               3877 *
                               3878 * BEGIN TESTING HIGH HALF OF 3RD FET WITH
                               3879 * MICROCODE RUNNING IN LCW HALF.
    2CC3 C0 87 5918            3880            B      LOADCS                    GO LOAD ADR 000 WITH BAL TO
    2CC7 9F               2CC7 3881            DC     XL1'9F'                   0800 AND
    2CC8 2D88             2CC9 3882            DC     AL2(R2DMCB)               FILL WITH BCS-TO-ADCR
    2CCA 2D89             2CCB 3883            DC     AL2(R2DMCC)               THRU 03FF
    2CCC C0 87 5918            3884            B      LOADCS                    GO FILL 0400-07FF WITH
    2CD0 7F               2CD0 3885            DC     XL1'7F'                   BOS-TO-ADDR
    2CD1 20               2CD1 3886            DC     XL1'20'
    2CD2 C0 87 5918            3887            B      LOADCS                    GO LOAD 2ND MICROPROGRAM AT
    2CD6 EF               2CD6 3888            DC     XL1'EF'                   0800 AND FILL REST OF CS WITH
    2CD7 2D44             2CD8 3889            DC     AL2(R2DMC3)               BOS-TO-ADDR
    2CD9 2D81             2CDA 3890            DC     AL2(R2DMC4)
    2CDB 40               2CDB 3891            DC     XL1'40'
                               3892
    2CDC 3A 01 554D            3893            SBN    EHBP.X'01'                SET ERROR-HALF-BYPASS ON.
    2CE0 3C 1A 5563            3894            MVI    LPCNT-1,X'1A'             EXTEND LOOP COUNT
    2CE4 F3 58 C0              3895            SIO    X'C0'.SIOI                ENABLE ATTACHMENT
    2CE7 31 4A 2DC4            3896            LIO    X1400.HDB2                PROVIDE START ADDR
    2CEB 31 4B 2DC6            3897            LIO    X1800.HDE3                PROVIDE END ADDR
    2CEF C0 87 54FE            3898            B      DOMICR                    GO DO MICRCPROGRAM
    2CF3 8D               2CF3 3899            DC     XL1'8D'                    ERROR HALT
    2CF4 501E             2CF5 3900            DC     XL2'501E'                  EXPECTED RESULTS
                               3901
    2CF6 0D 01 5FE6 2BF5       3902            CLC    STATAC(2).R2DEX2          TEST FOR ERROR
    2CFC C0 01 278A            3903            BNE    R17PO                     PRINT OUT IF ERROR
    2D00 C0 87 0216            3904            B      LINK                      EXIT TO NEXT ROUTINE.
                          2D04 3905 R2DMCS EQU    *
    2D04 5200             2D05 3906 R2DMCE DC     XL2'5200'       BOS.0 TO ADDR. 200
                               3907
                               3908 *
                               3909 *
                               3910 *
                               3911 *
                               3912 *-----------------------------*
                               3913 * START OF MICROPROGRAM LISTING *
                               3914 *-----------------------------*
                               3915 * 1ST MICRO PROGRAM
                          2D06 3916 R2DMC1 EQU    *
    2D06 7F00             2D07 3917            DC     XL2'7F00'   00  IC. SET HDB OF TO START DATA (00)
    2D08 240F             2D09 3918            DC     XL2'240F'   01  LOAD START DATA INTO HDB 04
    2D0A 7200             2D0B 3919            DC     XL2'7200'   02  IC. SET HDB 02 TO INDICATE WRITE
    2D0C 2014             2D0D 3920            DC     XL2'2014'   03  LR 0.14 START ADDR HI
```

8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2D0E 2115             2D0F 3921         DC    XL2'2115'   04  LR1,15 START ADDR LO
   2D10 0584             2D11 3922         DC    XL2'0584'   05  LE, WRITE M.B. FROM HDB 04
   2D12 0545             2D13 3923         DC    XL2'0545'   06  LE, READ M.B. DATA TO HDB 05
   2D14 B405             2D15 3924         DC    XL2'B405'   07  CIR, COMPARE DATA
   2D16 92E1             2D17 3925         DC    XL2'92E1'   08  BOC,0  BRANCH IF NO COMPARE
   2D18 1410             2D19 3926         DC    XL2'1410'   09  INC,  INCREMENT DATA
   2D1A 1110             2D1B 3927         DC    XL2'1110'   0A  INC,  INCREMENT ADDRESS
   2D1C 9205             2D1D 3928         DC    XL2'9205'   0B  BOC,0  LOOP IF NOT ZERO
   2D1E 1010             2D1F 3929         DC    XL2'1010'   0C  INC,  INCREMENT HI ADDR,
   2D20 B016             2D21 3930         DC    XL2'B016'   0D  CI,  TEST FOR END
   2D22 9205             2D23 3931         DC    XL2'9205'   0E  BOC,0  RETURN TO LOOP IF NOT
                         3932 *
                         3933 *       START READ LOOP
                         3934 *
   2D24 72FF             2D25 3935         DC    XL2'72FF'   0F  IC, SET HDB 02 TO INDICATE READ
   2D26 2014             2D27 3936         DC    XL2'2014'   10  LR 0,14 START ADDR HI
   2D28 2115             2D29 3937         DC    XL2'2115'   11  LR 1,15 START ADDR LO
   2D2A 240F             2D2B 3938         DC    XL2'240F'   12  LR, SET HDB 04 TO START DATA
   2D2C 0545             2D2D 3939         DC    XL2'0545'   13  LE, READ M.B. TO HDB 05
   2D2E B405             2D2F 3940         DC    XL2'B405'   14  CIR, COMPARE DATA
   2D30 92E2             2D31 3941         DC    XL2'92E2'   15  BOC,0  BRANCH IF ERROR
   2D32 1410             2D33 3942         DC    XL2'1410'   16  INC,  INCREMENT DATA
   2D34 1110             2D35 3943         DC    XL2'1110'   17  INC,  INCRMENT ADDRESS
   2D36 9213             2D37 3944         DC    XL2'9213'   18  BOC,0  LOOP IF NOT ZERO
   2D38 1010             2D39 3945         DC    XL2'1010'   19  INC,  INCREMENT HI ADDRESS
   2D3A B016             2D3B 3946         DC    XL2'B016'   1A  CI, TEST FOR END ADDRESS
   2D3C 9213             2D3D 3947         DC    XL2'9213'   1B  BOC,0  LOOP IF NOT END
   2D3E 1F10             2D3F 3948         DC    XL2'1F10'   1C  INC,  INCREMENT THE START DATA
   2D40 9201             2D41 3949         DC    XL2'9201'   1D  BOC,0  LOOP IF NOT ZERO
   2D42 521E             2D43 3950 R2DMC2  DC    XL2'521E'   1E  HANG, TEST IS COMPLETE
                         3951 *
                         3952 *
                         3953 *
                         3954 *
                         3955 * 2ND MICRO PROGRAM
                         3956
                         2D44 3957 R2DMC3  EQU   *
   2D44 7F00             2D45 3958         DC    XL2'7F00'   00  IC, SET HDB 0F TO START DATA (00)
   2D46 240F             2D47 3959         DC    XL2'240F'   01  LOAD START DATA INTO HDB 04
   2D48 7200             2D49 3960         DC    XL2'7200'   02  IC, SET HDB 02 TO INDICATE WRITE
   2D4A 2014             2D4B 3961         DC    XL2'2014'   03  LR 0,14 START ADDR HI
   2D4C 2115             2D4D 3962         DC    XL2'2115'   04  LR 1,15 START ADDR LO
   2D4E 0584             2D4F 3963         DC    XL2'0584'   05  LE, WRITE M.B. FROM HDB 04
   2D50 0545             2D51 3964         DC    XL2'0545'   06  LE, READ M.B. DATA TO HDB 05
   2D52 B405             2D53 3965         DC    XL2'B405'   07  CIR, COMPARE DATA
   2D54 90E1             2D55 3966         DC    XL2'90E1'   08  BOC,0  BRANCH IF NO COMPARE
   2D56 1410             2D57 3967         DC    XL2'1410'   09  INC,  INCREMENT DATA
   2D58 1110             2D59 3968         DC    XL2'1110'   0A  INC,  INCREMENT ADDRESS
   2D5A 9005             2D5B 3969         DC    XL2'9005'   0B  BOC,0  LOOP IF NOT ZERO
   2D5C 1010             2D5D 3970         DC    XL2'1010'   0C  INC,  INCREMENT HI ADDR,
   2D5E B016             2D5F 3971         DC    XL2'B016'   0D  CI,  TEST FOR END
   2D60 9005             2D61 3972         DC    XL2'9005'   0E  BOC,0  RETURN TO LOOP IF NOT
                         3973 *
                         3974 *       START READ LOOP
                         3975 *
   2D62 72FF             2D63 3976         DC    XL2'72FF'   0F  IC, SET HDB 02 TO INDICATE READ
   2D64 2014             2D65 3977         DC    XL2'2014'   10  LR 0,14 START ADDR LO
   2D66 2115             2D67 3978         DC    XL2'2115'   11  LR 0,14 START ADDR HI
   2D68 240F             2D69 3979         DC    XL2'240F'   12  LR, SET HDB 04 TO START DATA
   2D6A 0545             2D6B 3980         DC    XL2'0545'   13  LE, READ M.B. TO HDB 05
   2D6C B405             2D6D 3981         DC    XL2'B405'   14  CIR, COMPARE DATA
   2D6E 92E2             2D6F 3982         DC    XL2'92E2'   15  BOC,0  BRANCH IF ERROR
   2D70 1410             2D71 3983         DC    XL2'1410'   16  INC,  INCREMENT DATA
   2D72 1110             2D73 3984         DC    XL2'1110'   17  INC,  INCRMENT ADDRESS
   2D74 9013             2D75 3985         DC    XL2'9013'   18  BOC,0  LOOP IF NOT ZERO
   2D76 1010             2D77 3986         DC    XL2'1010'   19  INC,  INCREMENT HI ADDRESS
   2D78 B016             2D79 3987         DC    XL2'B016'   1A  CI, TEST FOR END ADDRESS
   2D7A 9013             2D7B 3988         DC    XL2'9013'   1B  BOC,0  LOOP IF NOT END
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2D7C 1F10             2D7D 3989         DC    XL2'1F10'   1C  INC,  INCREMENT THE START DATA
   2D7E 9001             2D7F 3990         DC    XL2'9001'   1D  BOC,0  LOOP IF NOT ZERO
   2D80 501E             2D81 3991 R2DMC4  DC    XL2'501E'   1E  HANG, TEST IS COMPLETE
                         3992
                         2D82 3993 R2DMC5  EQU   *
   2D82 D600             2D83 3994 R2DMC6  DC    XL2'D600'   000 BAL TO ADDR 600
                         3995
                         3996
                         2D84 3997 R2DMC7  EQU   *
   2D84 D400             2D85 3998 R2DMC8  DC    XL2'D400'   000 BAL TO ADDR 400
                         3999
                         2D86 4000 R2DMC9  EQU   *
   2D86 DA00             2D87 4001 R2DMCA  DC    XL2'DA00'   000 BAL TO ADDR A00
                         4002
                         2D88 4003 R2DMCB  EQU   *
   2D88 D800             2D89 4004 R2DMCC  DC    XL2'D800'   000 BAL TO ADDR 800
                         4005
   2D8A D9D6E4E340F2F440 2D8A 4006 RT2DOP  DC    CL49'ROUT 24 CONTROL STORE TEST (SKIPPED IF SSW 1C ON)'
   2D92 C3D6D5E3D9D6D340 4006
   2D9A E2E3D6D9C540E3C5 4006
   2DA2 E2E3404DE2D2C9D7 4006
   2DAA D7C5C440C9C64DE2 4006
   2DB2 E2E640F1C340D6D5 4006
   2DBA 5D               4006
   2DB8 0000             2DBC 4007 X0000   DC    XL2'0000'
   2DBD 0800             2DBE 4008 X0800   DC    XL2'0800'
   2DBF 0C00             2DC0 4009 X0C00   DC    XL2'0C00'
   2DC1 1000             2DC2 4010 X1000   DC    XL2'1000'
   2DC3 1400             2DC4 4011 X1400   DC    XL2'1400'
   2DC5 1800             2DC6 4012 X1800   DC    XL2'1800'
                         4013
                         4014 ********************************************************************
                         4015 *      ROUTINE 25 - SPARE                                          *
                         4016 ********************************************************************
                         4017
   2DC7 25               2DC7 4018 RT25    DC    XL1'25'           ROUTINE NUMBER
   2DC8 00               2DC8 4019         DC    XL1'00'           NO MANUAL INTERVENTION
   2DC9 2DE4             2DCA 4020         DC    AL2(RT26)         ADDRESS OF NEXT ROUTINE
   2DCB C0 87 021A       4021              B     PRINT
   2DCF 01               2DCF 4022         DC    XL1'01'
   2DD0 0D               2DD0 4023         DC    IL1'13'
   2DD1 2DE3             2DD2 4024         DC    AL2(R25HDR)
   2DD3 C0 87 0216       4025              B     LINK
   2DD7 D9D6E4E340F2F540 2DE3 4026 R25HDR  DC    CL13'ROUT 25 SPARE'
   2DDF E2D7C1D9C5       4026
                         4027
                         4028 ********************************************************************
                         4029 *      ROUTINE 26 - LIO HDB 1A TESTS                               *
                         4030 ********************************************************************
                         4031 *                                                                  *
                         4032 *      THIS ROUTINE CHECKS THE TSN THAT DETERMINES THAT HDB 1A HAS *
                         4033 *      BEEN LOADED BY THE PROGRAM.  IT CHECKS THAT THE TSN COMES ON*
                         4034 *      PROPERLY AND THAT IT IS RESET BY SSF C.  IT ALSO TESTS THAT *
                         4035 *      THE TSN DOES NOT COME ON IF ANY OTHER HDB'S ARE LOADED.     *
                         4036 *                                                                  *
                         4037 ********************************************************************
                         4038
   2DE4 26               2DE4 4039 RT26    DC    XL1'26'           ROUTINE NUMBER
   2DE5 00               2DE5 4040         DC    XL1'00'           NO MANUAL INTERVENTION
   2DE6 2E5F             2DE7 4041         DC    AL2(RT27)         ADDRESS OF NEXT ROUTINE
                         4042
                         2DF4 4043         USING R1BK01,XR1
   2DE8 C2 01 2DF4       4044              LA    R1BK01,XR1        INITIALIZE XR1 FOR INDEXING
                         4045
   2DEC C0 87 021A       4046              B     PRINT             PRINT ROUTINE HEADING
   2DF0 01               2DF0 4047         DC    XL1'01'
   2DF1 15               2DF1 4048         DC    IL1'21'
   2DF2 2E4A             2DF3 4049         DC    AL2(RT180P)
```

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ERR LOC  OBJECT CODE        ADDR STMT SOURCE STATEMENT

                                  4050
    2DF4 C0 87 5918               4051 R1BK01 B      LOADCS              .GO LOAD MICROPROGRAM
    2DF8 83                  2DF8 4052        DC     XL1'83'             .DISABLE UPON ENTRY, FILL 2ND
                                  4053 *                                  FSQ WITH BOS,0 ON ADDRESS
    2DF9 2E4B                2DFA 4054        DC     AL2(R1BMCS)         .START OF MICRO CODE
    2DFB 2E5E                2DFC 4055        DC     AL2(R1BMCE)         .END OF MICROCODE
                                  4056
    2DFD C0 87 54FE               4057        B      DOMICR              .GO DO FIRST PHASE
    2E01 69                  2E01 4058        DC     XL1'69'             .ERROR HALT  -69-
    2E02 5002                2E03 4059        DC     XL2'5002'           .EXPECTED STOP
                                  4060
    2E04 31 4D 0D56               4061        LIO    XAA55,HDE5          .DO LIO TO HDB 1A
                                  4062
    2E08 C0 87 54FE               4063        B      DOMICR              .GO DO NEXT PHASE
    2E0C 6A                  2E0C 4064        DC     XL1'6A'             .ERROR HALT  -6A-
    2E0D 5007                2E0E 4065        DC     XL2'5007'           .EXPECTED STOP
                                  4066
    2E0F 31 48 0D62               4067        LIO    ZERO,HDB0           .DO A LIO TO ALL HDB'S
    2E13 31 49 0D62               4068        LIO    ZERO,HDB1            EXCEPT HDB 1A-1B. THIS MUST
    2E17 31 4A 0D62               4069        LIO    ZERO,HDB2            NOT SET TSN LIO HDB1A
    2E1B 31 4B 0D62               4070        LIO    ZERO,HDB3
    2E1F 31 4C 0D62               4071        LIO    ZERO,HDB4
    2E23 31 4E 0D62               4072        LIO    ZERO,HDB6
    2E27 31 4F 0D62               4073        LIO    ZERO,HDB7
    2E2B C0 87 54FE               4074        B      DOMICR              .GO RESTART MICROPROGRAM
    2E2F 6C                  2E2F 4075        DC     XL1'6C'             .ERROR HALT  -6C-
    2E30 5009                2E31 4076        DC     XL2'5009'           .EXPECTED RESULT
                                  4077
    2E32 C0 87 0216               4078        B      LINK                .GO TO NEXT ROUTINE
                                  4079
    2E36 D9D6E4E340F2F640    2E4A 4080 RT1BOP DC     CL21'ROUT 26 TSN LIO HDB1A'
    2E3E E3E2D540D3C9D640         4080
    2E46 C8C4C2F1C1               4080
                                  4081
                                  4082 *--------------------------------*
                                  4083 * START OF MICROPROGRAM LISTING *
                                  4084 *--------------------------------*
                             2E4B 4085 R1BMCS EQU    *
    2E4B 1C08                2E4C 4086        DC     XL2'1C08'    00  SSF. RESET TSN 9
    2E4D 49E0                2E4E 4087        DC     XL2'49E0'    01  TSN. MUST NOT BRANCH
    2E4F 5002                2E50 4088        DC     XL2'5002'    02  HANG. END OF FIRST PHASE
    2E51 4905                2E52 4089        DC     XL2'4905'    03  TSN.  MUST BRANCH
    2E53 5004                2E54 4090        DC     XL2'5004'    04  ERROR, HANG
    2E55 1C08                2E56 4091        DC     XL2'1C08'    05  SSF. RESET TSN 9
    2E57 49E1                2E58 4092        DC     XL2'49E1'    06  TSN.  MUST NOT BRANCH
    2E59 5007                2E5A 4093        DC     XL2'5007'    07  HANG. END OF PHASE 2
    2E5B 49E2                2E5C 4094        DC     XL2'49E2'    08  TSN.S MUST NOT BRANCH
    2E5D 5009                2E5E 4095 R1BMCE DC     XL2'5009'    09  HANG. END OF TEST
                                  4096
                                  4096
                                  4097 *****************************************************
                                  4098 *      ROUTINE 27 - SPARE
                                  4099 *****************************************************
                                  4100
    2E5F 27                  2E5F 4101 RT27   DC     XL1'27'             ROUTINE NUMBER
    2E60 00                  2E60 4102        DC     XL1'00'             NO MANUAL INTERVENTION
    2E61 2E7C                2E62 4103        DC     AL2(RT28)           ADDRESS OF NEXT ROUTINE
    2E63 C0 87 021A               4104        B      PRINT
    2E67 01                  2E67 4105        DC     XL1'01'
    2E68 0D                  2E68 4106        DC     IL1'13'
    2E69 2E7B                2E6A 4107        DC     AL2(R27HDR)
    2E6B C0 87 0216               4108        B      LINK
    2E6F D9D6E4E340F2F740    2E7B 4109 R27HDR DC     CL13'ROUT 27 SPARE'
    2E77 E2D7C1D9C5               4109
                                  4110
                                  4111
                                  4111
                                  4112 *****************************************************
```



```
ERR LOC  OBJECT CODE        ADDR STMT SOURCE STATEMENT

                                  4113 *      ROUTINE 28 - SIO NON-IMMEDIATE TESTS
                                  4114 ***************************************************************
                                  4115 *                                                             *
                                  4116 *      THIS ROUTINE TESTS THAT WHEN A SIO NON-IMM IS ISSUED. THE *
                                  4117 *      IR/IQ BITS ARE LOADED INTO HDB 16-17, AND THAT THE ATTACHMENT *
                                  4118 *      BECOMES BUSY WHEN THE SIO SVC REQ. LATCH COMES ON.  IT THEN *
                                  4119 *      TESTS THAT THE MICROPROGRAM CAN RESET SIO SVC REQ WITH SSF C. *
                                  4120 *      IT THEN CHECKS TO BE SURE THAT THE HDB'S BEING MANIPULATED *
                                  4121 *      DURING THE IQ/IR CYCLES OF THE SIO NON-IMM WERE HANDLED *
                                  4122 *      CORRECTLY.  THE MICROPROGRAM IS THEN RERUN AND A TEST IS MADE *
                                  4123 *      TO ASSURE THAT A SIO NON-IMMEDIATE ISSUED WHILE THE ATTACH- *
                                  4124 *      MENT IS BUSY WILL HANG THE CPU UNTIL BUSY DROPS.        *
                                  4125 *                                                             *
                                  4126 ***************************************************************
                                  4127
    2E7C 28                  2E7C 4128 RT28   DC     XL1'28'             ROUTINE NUMBER
    2E7D 00                  2E7D 4129        DC     XL1'00'             NO MANUAL INTERVENTION
    2E7E 2E99                2E7F 4130        DC     AL2(RT29)           ADDRESS OF NEXT ROUTINE
                                  4131
    2E80 C0 87 021A               4132        B      PRINT               PRINT ROUTINE HEADING
    2E84 01                  2E84 4133        DC     XL1'01'
    2E85 0D                  2E85 4134        DC     IL1'13'
    2E86 2E98                2E87 4135        DC     AL2(R28HDR)
    2E88 C0 87 0216               4136        B      LINK                .TERMINATE
    2E8C D9D6E4E340F2F840    2E98 4137 R28HDR DC     CL13'ROUT 28 SPARE'
    2E94 E2D7C1D9C5               4137
                                  4138
                                  4139 ***************************************************************
                                  4140 *      ROUTINE 29 - TRANSMIT & RECEIVE WORD READY TESTS
                                  4141 ***************************************************************
                                  4142 *                                                             *
                                  4143 *      THIS ROUTINE CHECKS THAT TRANSMIT AND RECEIVE WORD READY AND *
                                  4144 *      THE INVOLVED TSN'S ARE WORKING PROPERLY.  A WORD OF ZEROES *
                                  4145 *      IS TRANSMITTED AND WRAPPED BACK IN DIAGNOSTIC MODE.  NO CHECK *
                                  4146 *      IS MADE ON THE DATA.                                   *
                                  4147 *                                                             *
                                  4148 ***************************************************************
                                  4149
    2E99 29                  2E99 4150 RT29   DC     XL1'29'             ROUTINE NUMBER
    2E9A 00                  2E9A 4151        DC     XL1'00'             NO MANUAL INTERVENTION
    2E9B 2F40                2E9C 4152        DC     AL2(RT2A)           ADDRESS OF NEXT ROUTINE
                                  4153
                             2EA9 4154        USING  R1EK01,XR1
    2E9D C2 01 2EA9               4155        LA     R1EK01,XR1          INITIALIZE XR1 FOR INDEXING
                                  4156
    2EA1 C0 87 021A               4157        B      PRINT               PRINT ROUTINE HEADING
    2EA5 01                  2EA5 4158        DC     XL1'01'
    2EA6 1D                  2EA6 4159        DC     IL1'29'
    2EA7 2EE5                2EA8 4160        DC     AL2(RT1EOP)
                                  4161
    2EA9 C0 87 5918               4162 R1EK01 B      LOADCS              .GO LOAD MICROPROGRAM
    2EAD 83                  2EAD 4163        DC     XL1'83'             .DISABLE UPON ENTRY, FILL 2ND
                                  4164 *                                  FSQ WITH BCS,0 ON ADDRESS
    2EAE 2EE6                2EAF 4165        DC     AL2(R1EMCS)         .START OF MICRO CODE
    2EB0 2F3F                2EB1 4166        DC     AL2(R1EMCE)         .END OF MICROCODE
                                  4167
    2EB2 F3 58 E0                 4168        SIO    X'E0',SICI          .ENABLE MICROCONTROLLER TO
    2EB5 0D 1D 5512 5512          4169        CLC    REPEAT(30),REPEAT    DO A DRY RUN TO SET UP
    2EBB F3 58 80                 4170        SIO    X'80',SIOI           POWER UP CONDITIONS
                                  4171
    2EBE C0 87 54FE               4172        B      DOMICR              .GO EXECUTE MICROPROGRAM
    2EC2 80                  2EC2 4173        DC     XL1'80'             .ERROR HALT  -80-
    2EC3 5025                2EC4 4174        DC     XL2'5025'           .EXPECTED RESULT
                                  4175
    2EC5 C0 87 0216               4176        B      LINK                .GO TO NEXT ROUTINE
                                  4177
    2EC9 D9D6E4E340F2F940    2EE5 4178 RT1EOP DC     CL29'ROUT 29 XMIT & RCV WORD READY'
    2ED1 E7D4C9E340504040         4178
```

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    2ED9 C3E540E6D6D9C440      4178
    2EE1 D9C5C1C4E8            4178
                               4179
                               4180 *--------------------------------*
                               4181 * START OF MICROPROGRAM LISTING *
                               4182 *--------------------------------*
                          2EE6 4183 R1EMCS EQU   *
    2EE6 5026             2EE7 4184        DC    XL2'5026'   00  BOS.0  GO SET INSIDE WRAP
    2EE8 0B80             2EE9 4185        DC    XL2'0B80'   01  LE. DESELECT ALL LINES
    2EEA 1F04             2EEB 4186        DC    XL2'1F04'   02  SSN.F  TURN ON DIAGNOSTIC MODE
    2EEC 1008             2EED 4187        DC    XL2'1008'   03  SSF.0  RESET I/O REG BITS 2.3.13
    2EEE 0780             2EEF 4188        DC    XL2'0780'   04  LE.  LOAD I/O REG & XMIT WORD (ZEROES)
    2EF0 40E1             2EF1 4189        DC    XL2'40E1'   05  TSN.0  MUST NOT BRANCH
    2EF2 0780             2EF3 4190        DC    XL2'0780'   06  LE.  RELOAD I/O REG
    2EF4 4009             2EF5 4191        DC    XL2'4009'   07  TSN.0  MUST BRANCH
    2EF6 5008             2EF7 4192        DC    XL2'5008'   08  ERROR. HANG
    2EF8 41E2             2EF9 4193        DC    XL2'41E2'   09  TSN.1  MUST NOT BRANCH
    2EFA 400C             2EFB 4194        DC    XL2'400C'   0A  TSN.0  MUST BRANCH
    2EFC 500B             2EFD 4195        DC    XL2'500B'   0B  ERROR. HANG
    2EFE 41E3             2EFF 4196        DC    XL2'41E3'   0C  TSN.1  MUST NOT BRANCH
    2F00 400F             2F01 4197        DC    XL2'400F'   0D  TSN.0  MUST BRANCH
    2F02 500E             2F03 4198        DC    XL2'500E'   0E  ERROR. HANG
    2F04 41E4             2F05 4199        DC    XL2'41E4'   0F  TSN.1  MUST NOT BRANCH
    2F06 4012             2F07 4200        DC    XL2'4012'   10  TSN.0  MUST BRANCH
    2F08 5011             2F09 4201        DC    XL2'5011'   11  ERROR. HANG
    2F0A 41E5             2F0B 4202        DC    XL2'41E5'   12  TSN.1 MUST NOT BRANCH
    2F0C 4015             2F0D 4203        DC    XL2'4015'   13  TSN.0  MUST BRANCH
    2F0E 5014             2F0F 4204        DC    XL2'5014'   14  ERROR. HANG
    2F10 41E6             2F11 4205        DC    XL2'41E6'   15  TSN.1  MUST NOT BRANCH
    2F12 4018             2F13 4206        DC    XL2'4018'   16  TSN.0  MUST BRANCH
    2F14 5017             2F15 4207        DC    XL2'5017'   17  ERROR. HANG
    2F16 411A             2F17 4208        DC    XL2'411A'.  18  TSN.1  MUST BRANCH THIS TIME
    2F18 5019             2F19 4209        DC    XL2'5019'   19  ERROR. HANG
    2F1A 40E7             2F1B 4210        DC    XL2'40E7'   1A  TSN.0  MUST NOT BRANCH THIS TIME
    2F1C 0244             2F1D 4211        DC    XL2'0244'   1B  LE.  PUT I/O REG INTO HDB 02
    2F1E 41E8             2F1F 4212        DC    XL2'41E8'   1C  TSN.1  MUST NOT BRANCH
    2F20 411F             2F21 4213        DC    XL2'411F'   1D  TSN.1  LOOP UNTIL REC. WD. RDY. ON AGAIN
    2F22 501D             2F23 4214        DC    XL2'501D'   1E  BOS.0 BRANCH BACK TO ABOVE WORD
    2F24 7400             2F25 4215        DC    XL2'7400'   1F  IC. SET HDB 4 = 00
    2F26 4122             2F27 4216        DC    XL2'4122'   20  TSN.1 MUST STILL BRANCH
    2F28 5021             2F29 4217        DC    XL2'5021'   21  ERROR. HANG
    2F2A 0244             2F2B 4218        DC    XL2'0244'   22  LE.  PUT I/O REG IN HDB 02
    2F2C 41E9             2F2D 4219        DC    XL2'41E9'   23  TSN.1  MUST NOT BRANCH
    2F2E 1F08             2F2F 4220        DC    XL2'1F08'   24  SSF.F  RESET DIAGNOSTIC MODE
    2F30 5025             2F31 4221        DC    XL2'5025'   25  HANG. TEST COMPLETED
    2F32 1E04             2F33 4222        DC    XL2'1E04'   26  SSN.E  TURN ON INSIDE WRAP
    2F34 7000             2F35 4223        DC    XL2'7000'   27  IC.  PUT 00 IN HDB 00 TO DESELECT LINES
    2F36 0A80             2F37 4224        DC    XL2'0A80'   28  LE.DESELECT ALL ALT LINES.
    2F38 0C80             2F39 4225        DC    XL2'0C80'   29  LE       DESELECTS C
    2F3A 0D80             2F3B 4226        DC    XL2'0D80'   2A  LE       DESELECTS D
    2F3C 0E80             2F3D 4227        DC    XL2'0E80'   2B  LE       DESELECTS E
    2F3E 5001             2F3F 4228 R1EMCE DC    XL2'5001'   2C  BOS.0  TO ADDRESS 001.
                               4229
                               4229
                               4230 ************************************************************
                               4231 *      ROUTINE 2A - DATA WRAP TEST (ALL BITS)                  *
                               4232 ************************************************************
                               4233 *                                                             *
                               4234 *      THIS ROUTINE WRAPS ALL BITS IN DIAGNOSTIC MODE AND TESTS  *
                               4235 *      THAT THE BITS RECEIVED ARE THE SAME AS THOSE TRANSMITTED.  *
                               4236 *      THE DATA TO BE USED IS SUPPLIED BY PRE-LOADING HDB 10-11.  *
                               4237 *      THE DATA PATTERN IS WRAPPED AND CHECKED 255 TIMES.  THE   *
                               4238 *      MICROPROGRAM FOR THIS ROUTINE IS USED FOR THE NEXT 3 ROUTINES *
                               4239 *      BY SUPPLYING DIFFERENT DATA TO HDB 10-11.                 *
                               4240 *                                                             *
                               4241 ************************************************************
                               4242
    2F40 2A               2F40 4243 RT2A   DC    XL1'2A'                     ROUTINE NUMBER
```



```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    2F41 00               2F41 4244        DC    XL1'00'                 NO MANUAL INTERVENTION
    2F42 3049             2F43 4245        DC    AL2(RT2B)               ADDRESS OF NEXT ROUTINE
                               4246
                          2F62 4247        USING R1FK01.XR1
    2F44 C2 01 2F62            4248        LA    R1FK01.XR1              INITIALIZE XR1 FOR INDEXING
                               4249
    2F48 C0 87 021A            4250        B     PRINT                   PRINT ROUTINE HEADING
    2F4C 01               2F4C 4251        DC    XL1'01'
    2F4D 19               2F4D 4252        DC    IL1'25'
    2F4E 2FA6             2F4F 4253        DC    AL2(RT1FOP)
                               4254
    2F50 0C 01 3022 303A       4255        MVC   R1FMCE-6(2).HDB900
    2F56 0C 01 3024 303C       4256        MVC   R1FMCE-4(2).LISELA
    2F5C 0C 01 3026 3046       4257        MVC   R1FMCE-2(2).WRPIN
    2F62 C0 87 5918            4258 R1FK01 B     LOADCS                  .GO LOAD MICROPROGRAM
    2F66 83               2F66 4259        DC    XL1'83'                 .DISABLE UPON ENTRY. FILL 2ND
                               4260 *                                     FSQ WITH BOS.0 ON ADDRESS
    2F67 2FA7             2F68 4261        DC    AL2(R1FMCS)             .START OF MICRO CODE
    2F69 3028             2F6A 4262        DC    AL2(R1FMCE)             .END OF MICROCODE
                               4263
    2F6B 31 48 56E1            4264        LIO   X03FF.HDB0              .LOAD DATA PATTERN
    2F6F 3C 10 5564            4265        MVI   LPCNT.X'10'             .INCREASE MICROPROGRAM TIME
    2F73 3A 01 554D            4266        SBN   EHBP.X'01'              .SET ERROR BYPASS BIT ON
    2F77 C0 87 54FE            4267        B     DOMICR                  .GO EXECUTE MICROPROGRAM
    2F7B 82               2F7B 4268        DC    XL1'82'                 .ERROR HALT  -82-
    2F7C 5037             2F7D 4269 R1FEX1 DC    XL2'5037'               .EXPECTED END OF TEST
    2F7E 4D 01 1B 5FE6         4270        CLC   R1FEX1(2.XR1).STATAC    .TEST FOR ACTUAL END OF TEST
    2F83 F2 81 04              4271        JE    R1FB01                  .JUMP IF SO
    2F86 C0 87 525A            4272        B     PIOREG                  .ERROR GO PRINT I/O REG
                               4273
    2F8A C0 87 02:6            4274 R1FB01 B     LINK                    .GO TO NEXT ROUTINE
                               4275
    2F8E D9D6E4E340F2C140 2FA6 4276 RT1FOP DC    CL25'ROUT 2A XMIT/REC ALL BITS'
    2F96 E7D4C9E361D9C5C3      4276
    2F9E 40C1D3D340C2C9E3      4276
    2FA6 E2                    6276
                               4277
                               4278 *--------------------------------*
                               4279 * START OF MICROPROGRAM LISTING *
                               4280 *--------------------------------*
                               4281 ***************************************************************
                               4282 *  THE FOLLOWING MICROPROGRAM IS USED BY ROUTINES 2A.2B.2C.2D.3C.    *
                               4283 *  WORDS 03D. 03E & 03F ARE MODIFIED TO SUIT THE USING ROUTINE.      *
                               4284 *                                                                    *
                               4285 * SEE BELOW FOR CHOICES
                               4286 ***************************************************************
                               4287
                          2FA7 4288 R1FMCS EQU   *
    2FA7 7A00             2FA8 4289        DC    XL2'7A00'   00  IC ZERO OUT HDB A.
    2FA9 5038             2FAA 4290        DC    XL2'5038'   01  BOS.0 TO ADDR 038.
    2FAB 5002             2FAC 4291        DC    XL2'5002'   02  ERROR. HANG
    2FAD 2010             2FAE 4292        DC    XL2'2010'   03  LR.  HDB 00 = BITS 2.3.13 TO BE WRAPPED
    2FAF 2111             2FB0 4293        DC    XL2'2111'   04  LR.  HDB 01 = BITS 4-11 TO BE WRAPPED
    2FB1 74FF             2FB2 4294        DC    XL2'74FF'   05  IC. SET RESET PATTERN TO FF
    2FB3 E100             2FB4 4295        DC    XL2'E100'   06  CI. TEST BITS TO BE WRAPPED = 00
    2FB5 9C09             2FB6 4296        DC    XL2'9C09'   07  BOC.3  IF SO LEAVE RESET PATTERN = FF
    2FB7 7400             2FB8 4297        DC    XL2'7400'   08  IC. CHANGE RESET PATTERN TO 00
    2FB9 7500             2FBA 4298        DC    XL2'7500'   09  IC. RESET REC. CHK. INDICATOR
    2FBB 1508             2FBC 4299        DC    XL2'1508'   0A  SSF. RESET REC. CHK.
    2FBD 7683             2FBE 4300        DC    XL2'7683'   0B  IC. INITIALIZE RECEIVE HDB 06
    2FBF 2704             2FC0 4301        DC    XL2'2704'   0C  LR. INITIALIZE RECEIVE HDB 07
    2FC1 7301             2FC2 4302        DC    XL2'7301'   0D  INITIALIZE COUNTER TO 01
    2FC3 1008             2FC4 4303        DC    XL2'1008'   0E  RESET I/O REG BITS 2.3.13
    2FC5 1F04             2FC6 4304        DC    XL2'1F04'   0F  SSN. SET ON DIAGNOSTIC MODE
    2FC7 F002             2FC8 4305        DC    XL2'F002'   10  TBN. CHECK FOR BIT 2 TO BE ON
    2FC9 9013             2FCA 4306        DC    XL2'9013'   11  BCC.0  BRANCH IF BIT 2 SHOULD BE OFF
    2FCB 1204             2FCC 4307        DC    XL2'1204'   12  SSN. SET BIT 2 OF I/O REG ON
    2FCD F001             2FCE 4308        DC    XL2'F001'   13  TBN. CHECK FOR BIT 3 TO BE OFF
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2FCF 9016             2FD0 4309         DC    XL2'9016'     14  BOC,0 BRANCH IF SO
   2FD1 1304             2FD2 4310         DC    XL2'1304'     15  SSN, SET BIT 3 OF I/O REG ON
   2FD3 0781             2FD4 4311         DC    XL2'0781'     16  LE, LOAD I/O REG AND TRANSMIT WORD
   2FD5 4017             2FD6 4312         DC    XL2'4017'     17  TSN,0  WAIT A CYCLE
   2FD7 1008             2FD8 4313         DC    XL2'1008'     18  SSF,0 RESET BITS 2,3,13 OF I/O REG
   2FD9 0784             2FDA 4314         DC    XL2'0784'     19  LE, CHANGE BITS 4-11 OF I/O REG AND
                         4315 *                                      START ANOTHER TRANSMIT.
   2FDB 401C             2FDC 4316         DC    XL2'401C'     1A  TSN,0  MUST BRANCH
   2FDD 501B             2FDE 4317         DC    XL2'501B'     1B  ERROR, HANG
   2FDF 411E             2FE0 4318         DC    XL2'411E'     1C  TSN,1 WAIT FOR REC. WORD READY ON
   2FE1 501C             2FE2 4319         DC    XL2'501C'     1D  BOS,0 RETURN TO PREVIOUS WORD
   2FE3 0744             2FE4 4320         DC    XL2'0744'     1E  LE, MOVE I/O REG TO HDB 07
   2FE5 41E1             2FE6 4321         DC    XL2'41E1'     1F  TSN,1 MUST NOT BRANCH
   2FE7 4222             2FE8 4322         DC    XL2'4222'     20  TSN,2 CHECK FOR BIT 2 ON
   2FE9 C602             2FEA 4323         DC    XL2'C602'     21  SBF, SET BIT 2 FLAG OFF IN HDB 06
   2FEB 4324             2FEC 4324         DC    XL2'4324'     22  TSN,3 CHECK FOR BIT 3 ON
   2FED C601             2FEE 4325         DC    XL2'C601'     23  SBF, SET BIT 3 FLAG OFF IN HDB 06
   2FEF 4A26             2FF0 4326         DC    XL2'4A26'     24  TSN,A  CHECK FOR BIT 13 OFF
   2FF1 C680             2FF2 4327         DC    XL2'C680'     25  SBF, SET BIT 13 FLAG OFF IN HDB 06
   2FF3 4B34             2FF4 4328         DC    XL2'4E34'     26  TSN,B  CHECK FOR RECEIVE CHECK
   2FF5 B600             2FF6 4329         DC    XL2'B600'     27  CIR, COMPARE HDB 06 WITH 00
   2FF7 9C2A             2FF8 4330         DC    XL2'9C2A'     28  BOC,3  ERROR IF NOT THE SAME
   2FF9 5035             2FFA 4331         DC    XL2'5035'     29  BOS 0 TO ADR 35, DATA ERROR
   2FFB B701             2FFC 4332         DC    XL2'B701'     2A  CIR, COMPARE HDB 07 WITH 01
   2FFD 9C2D             2FFE 4333         DC    XL2'9C2D'     2B  BOC,3  ERROR IF NOT THE SAME
   2FFF 5035             3000 4334         DC    XL2'5035'     2C  BOS 0 TO ADR 35, DATA ERROR
   3001 7683             3002 4335         DC    XL2'7683'     2D  IC, INITIALIZE HDB 06 AGAIN
   3003 1310             3004 4336         DC    XL2'1310'     2E  INC, INCREMENT THE COUNTER
   3005 9C37             3006 4337         DC    XL2'9C37'     2F  BOC,3 BRANCH IF END OF TEST
   3007 411E             3008 4338         DC    XL2'411E'     30  TSN,1 REC, WD, READY MUST BE ON AGAIN
   3009 F301             300A 4339         DC    XL2'F301'     31  TBN, IF NOT, COUNT MUST BE ODD
   3008 9C0E             300C 4340         DC    XL2'9C0E'     32  BOC,3 IF SO, RESTART PROGRAM
   300D 5033             300E 4341         DC    XL2'5033'     33  ERROR, HANG
   300F 75FF             3010 4342         DC    XL2'75FF'     34  REC, CHK, SET HDB 5 = FF
   3011 5035             3012 4343         DC    XL2'5035'     35  DATA ERROR, HANG
   3013 5036             3014 4344         DC    XL2'5036'     36  DUMMY HANG
   3015 5037             3016 4345         DC    XL2'5037'     37  HANG, END OF PROGRAM
   3017 0A8A             3018 4346         DC    XL2'0A8A'     38  LE A,A     DESEL ALL DR/REC; DECODE A
   3019 0B8A             301A 4347         DC    XL2'0B8A'     39  LE B,A     DESEL ALL DR/REC; DECODE B
   3018 0C8A             301C 4348         DC    XL2'0C8A'     3A  LE C,A     DESEL ALL DR/REC; DECODE C
   301D 0D8A             301E 4349         DC    XL2'0D8A'     3B  LE D,A     DESEL ALL DR/REC; DECODE D
   301F 0E8A             3020 4350         DC    XL2'0E8A'     3C  LE E,A     DESEL ALL DR/REC; DECODE E
   3021 0000             3022 4351         DC    XL2'0000'     3D  IC 9,X'ZZ' FILLED IN BY USER.
   3023 0000             3024 4352         DC    XL2'0000'     3E  LE Z,9     FILLED IN BY USER.
   3025 0000             3026 4353         DC    XL2'0000'     3F  'SET INSIDE WR' OR' BOS TO 040
   3027 5003             3028 4354 R1FMCE  DC    XL2'5003'     40  BOS,0 TO ADDR 003.                    BY USER.
                         4355
                         4356
                         4357 * CHOICES FOR WORD 03D
   3029 7980             302A 4358 HDB980  DC    XL2'7980'       IC HDB 9 EQUAL 80          LOADED BY USER
   3028 7940             302C 4359 HDB940  DC    XL2'7940'       IC HDB 9 EQUAL 40          LOADED BY USER
   302D 7920             302E 4360 HDB920  DC    XL2'7920'       IC HDB 9 EQUAL 20          LOADED BY USER
   302F 7910             3030 4361 HDB910  DC    XL2'7910'       IC HDB 9 EQUAL 10          LOADED BY USER
   3031 7908             3032 4362 HDB908  DC    XL2'7908'       IC HDB 9 EQUAL 08          LOADED BY USER
   3033 7904             3034 4363 HDB904  DC    XL2'7904'       IC HDB 9 EQUAL 04          LOADED BY USER
   3035 7902             3036 4364 HDB902  DC    XL2'7902'       IC HDB 9 EQUAL 02          LOADED BY USER
   3037 7901             3038 4365 HDB901  DC    XL2'7901'       IC HDB 9 EQUAL 01          LOADED BY USER
   3039 7900             303A 4366 HDB900  DC    XL2'7900'       IC HDB 9 EQUAL 00          LOADED BY USER
                         4367
                         4368 * CHOICES FOR WORD 03E
   303B 0A89             303C 4369 LISELA  DC    XL2'0A89'     LE LINE-SEL-A FROM HDB 9. LOADED BY USER
   303D 0B89             303E 4370 LISELB  DC    XL2'0B89'     LE LINE-SEL-B FROM HDB 9. LOADED BY USER
   303F 0C89             3040 4371 LISELC  DC    XL2'0C89'     LE LINE-SEL-C FROM HDB 9. LOADED BY USER
   3041 0D89             3042 4372 LISELD  DC    XL2'0D89'     LE LINE-SEL-D FROM HDB 9. LOADED BY USER
   3043 0E89             3044 4373 LISELE  DC    XL2'0E89'     LE LINE-SEL-E FROM HDB 9. LOADED BY USER
                         4374
                         4375 * CHOICES FOR WORD 03F
   3045 1E04             3046 4376 WRPIN   DC    XL2'1E04'     CSNE       SET INSIDE WRAP
```


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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3047 5040             3048 4377 WRPOUT  DC    XL2'5040'       BOS,0 TO ADR 040
                         4378 ********************************************************************
                         4379 *       ROUTINE 2B - DATA WRAP (NO BITS)                           *
                         4380 ********************************************************************
                         4381 *                                                                  *
                         4382 *       THIS ROUTINE IS SIMILAR TO THE LAST ROUTINE EXCEPT THAT NO  *
                         4383 *       BITS ARE WRAPPED.  THE MICROPROGRAM LOADED AND EVERYTHING   *
                         4384 *       EXCEPT THE DATA IS THE SAME.                               *
                         4385 *                                                                  *
                         4386 ********************************************************************
                         4387
   3049 2B               3049 4388 RT2B    DC    XL1'2B'         ROUTINE NUMBER
   304A 00               304A 4389         DC    XL1'00'         NO MANUAL INTERVENTION
   304B 30C1             304C 4390         DC    AL2(RT2C)       ADDRESS OF NEXT ROUTINE
                         4391
                         3077 4392         USING R20K01,XR1
   304D C2 01 3077       4393         LA    R20K01,XR1      INITIALIZE XR1 FOR INDEXING
                         4394
   3051 C0 87 021A       4395         B     PRINT           PRINT ROUTINE HEADING
   3055 01               3055 4396         DC    XL1'01'
   3056 18               3056 4397         DC    IL1'24'
   3057 308A             3058 4398         DC    AL2(RT20OP)
                         4399
   3059 C0 87 5918       4400         B     LOADCS          *LOAD PGM TO SET CURAR
   305D 83               305D 4401         DC    XL1'83'
   305E 308B             305F 4402         DC    AL2(R20MCS)
   3060 30C0             3061 4403         DC    AL2(R20MCE)
   3062 F3 58 E0         4404         SIO   X'E0',SIOI      *ENABLE MICRO CONTROLLER
                         4405 *                                TO SET CURAR
   3065 0C 01 3022 303A  4406         MVC   R1FMCE-6(2),HDB900
   306B 0C 01 3024 303C  4407         MVC   R1FMCE-4(2),LISELA
   3071 0C 01 3026 3046  4408         MVC   R1FMCE-2(2),WRPIN
   3077 C0 87 5918       4409 R20K01 B     LOADCS          *GO LOAD MICROPROGRAM
   307B 83               307B 4410         DC    XL1'83'         *DISABLE UPON ENTRY, FILL 2ND
                         4411 *                                FSQ WITH BOS,0 ON ADDRESS
   307C 2FA7             307D 4412         DC    AL2(R1FMCS)     *START OF MICRC CODE
   307E 3028             307F 4413         DC    AL2(R1FMCE)     *END OF MICROCODE
                         4414
   3080 31 48 0D62       4415         LIO   ZERO,HDB0       *LOAD DATA PATTERN
   3084 3C 10 5564       4416         MVI   LPCNT,X'10'     *INCREASE MICROPROGRAM TIME
   3088 3A 01 554D       4417         SBN   EHBP,X'01'      *SET ERROR BYPASS BIT ON
   308C C0 87 54FE       4418         B     DOMICR          *GO EXECUTE MICROPROGRAM
   3090 84               3090 4419         DC    XL1'84'         *ERROR HALT  -84-
   3091 5037             3092 4420 R20EX1  DC    XL2'5037'       *EXPECTED END OF TEST
   3093 4D 01 1B 5FE6    4421         CLC   R20EX1(2,XR1),STATAC    *TEST FOR ACTUAL END OF TEST
   3098 F2 81 04         4422         JE    R20B01          *JUMP IF SO
   309B C0 87 525A       4423         B     PIOREG          *ERROR GO PRINT I/O REG
                         4424
   309F C0 87 0216       4425 R20B01 B     LINK            *GO TO NEXT ROUTINE
                         4426
   30A3 D9D6E4E340F2C240 30BA 4427 RT20OP  DC    CL24'ROUT 2B XMIT/REC NO BITS'
   30AB E7D4C9E361D9C3C3 4427
   30B3 40D5D640C2C9E3E2 4427
                         4428 *-------------------------------*
                         4429 * START OF MICROPROGRAM LISTING *
                         4430 *-------------------------------*
                         30BB 4431 R20MCS  EQU   *
   30BB 7000             30BC 4432         DC    XL2'7000'   00  IC, SET HDB 00 TO ZERO
   30BD 7171             30BE 4433         DC    XL2'7171'   01  IC, SET HDB 01 TO 71
   30BF 1704             30C0 4434 R20MCE  DC    XL2'1704'   02  SSN, LOAD CURAR FROM MBAR
                         4435
                         4436 ********************************************************************
                         4437 *       ROUTINE 2C - DATA WRAP (ALTERNATE BITS AA)                 *
                         4438 ********************************************************************
                         4439 *                                                                  *
                         4440 *       THIS ROUTINE IS LIKE THE LAST ROUTINE EXCEPT THAT ALT. (AA) *
                         4441 *       BITS ARE WRAPPED.  THE MICROPROGRAM LOADED AND EVERYTHING   *
                         4442 *       EXCEPT THE DATA IS THE SAME.                               *
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              4443 *
                              4444 ************************************************************************
                              4445
    30C1 2C               30C1 4446 RT2C    DC    XL1'2C'                 ROUTINE NUMBER
    30C2 00               30C2 4447         DC    XL1'00'                 NO MANUAL INTERVENTION
    30C3 3130             30C4 4448         DC    AL2(RT2D)               ADDRESS OF NEXT ROUTINE
                              4449
    30C5 C0 87 021A            4450         B     PRINT                   PRINT ROUTINE HEADING
    30C9 01               30C9 4451         DC    XL1'01'
    30CA 19               30CA 4452         DC    IL1'25'
    30CB 312F             30CC 4453         DC    AL2(RT21CP)
                              4454
                          30E3 4465         USING R21K01,XR1
    30CD C2 01 30E3            4456 R21ST   LA    R21K01,XR1              INITIALIZE XR1 FOR INDEXING
                              4457
    30D1 0C 01 3022 303A       4458         MVC   R1FMCE-6(2),HDB900
    30D7 0C 01 3024 303C       4459         MVC   R1FMCE-4(2),LISELA
    30DD 0C 01 3026 3046       4460         MVC   R1FMCE-2(2),WRPIN
    30E3 C0 87 5918            4461 R21K01  B     LOADCS                  .GO LOAD MICROPROGRAM
    30E7 83               30E7 4462         DC    XL1'83'                 .DISABLE UPON ENTRY, FILL 2ND
                              4463 *                                       FSQ WITH BOS,0 ON ADDRESS
    30E8 2FA7             30E9 4464         DC    AL2(R1FMCS)             .START OF MICRO CODE
    30EA 3028             30EB 4465         DC    AL2(R1FMCE)             .END OF MICROCODE
                              4466
    30EC 31 48 274D            4467         LIO   X02AA,HDE0              .LOAD DATA PATTERN
    30F0 3C 10 5564            4468         MVI   LPCNT,X'10'             .INCREASE MICROPROGRAM TIME
    30F4 3A 01 554D            4469         SBN   EHBP,X'01'              .SET ERROR BYPASS BIT ON
    30F8 C0 87 54FE            4470         B     DOMICR                  .GO EXECUTE MICROPROGRAM
    30FC 86               30FC 4471         DC    XL1'86'                 .ERROR HALT  -86-
    30FD 5037             30FE 4472 R21EX1  DC    XL2'5037'               .EXPECTED END OF TEST
    30FF 4D 01 1B 5FE6         4473         CLC   R21EX1(2,XR1),STATAC    .TEST FOR ACTUAL END OF TEST
    3104 F2 81 04              4474         JE    R21B01                  .JUMP IF SO
    3107 C0 87 525A            4475         B     PIOREG                  .ERROR GO PRINT I/O REG
                              4476
    310B 3D 42 0A03            4477 R21B01  CLI   PRTN,X'42'              .TEST FOR ROUTINE 42
    310F C0 81 4FF4            4478         BE    R40R2                   .RETURN IF SO
    3113 C0 87 0216            4479         B     LINK                    .GO TO NEXT ROUTINE
                              4480
    3117 D9D6E4E340F2C340 312F 4481 RT21OP  DC    CL25'ROUT 2C XMIT/REC ALT BITS'
    311F E7D4C9E361D9C5C3      4481
    3127 40C1D3E340C2C9E3      4481
    312F E2                    4481
                              4482
                              4482
                              4483 ************************************************************************
                              4484 *      ROUTINE 2D - DATA WRAP (ALTERNATE BITS 55)                      *
                              4485 ************************************************************************
                              4486 *                                                                      *
                              4487 *      THIS ROUTINE IS LIKE THE LAST ROUTINE EXCEPT THAT ALT. (55)     *
                              4488 *      BITS ARE WRAPPED.  THE MICROPROGRAM LOADED AND EVERYTHING       *
                              4489 *      EXCEPT THE DATA IS THE SAME.                                    *
                              4490 *                                                                      *
                              4491 ************************************************************************
                              4492
    3130 2D               3130 4493 RT2D    DC    XL1'2D'                 ROUTINE NUMBER
    3131 00               3131 4494         DC    XL1'00'                 NO MANUAL INTERVENTION
    3132 3199             3133 4495         DC    AL2(RT2E)               ADDRESS OF NEXT ROUTINE
                              4496
                          3152 4497         USING R22K01,XR1
    3134 C2 01 3152            4498         LA    R22K01,XR1              INITIALIZE XR1 FOR INDEXING
                              4499
    3138 C0 87 021A            4500         B     PRINT                   PRINT ROUTINE HEADING
    313C 01               313C 4501         DC    XL1'01'
    3130 19               313D 4502         DC    IL1'25'
    313E 3196             313F 4503         DC    AL2(RT22OP)
                              4504
    3140 0C 01 3022 303A       4505         MVC   R1FMCE-6(2),HDB900
    3146 0C 01 3024 303C       4506         MVC   R1FMCE-4(2),LISELA
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8912   DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    314C 0C 01 3026 3046       4507         MVC   R1FMCE-2(2),WRPIN
    3152 C0 87 5918            4508 R22K01  B     LOADCS                  .GO LOAD MICROPROGRAM
    3156 83               3156 4509         DC    XL1'83'                 .DISABLE UPON ENTRY, FILL 2ND
                              4510 *                                       FSQ WITH BOS,0 ON ADDRESS
    3157 2FA7             3158 4511         DC    AL2(R1FMCS)             .START OF MICRO CODE
    3159 3028             315A 4512         DC    AL2(R1FMCE)             .END OF MICROCODE
                              4513
    315B 31 48 3198            4514         LIO   X0155,HDE0              .LOAD DATA PATTERN
    315F 3C 10 5564            4515         MVI   LPCNT,X'10'             .INCREASE MICROPROGRAM TIME
    3163 3A 01 554D            4516         SBN   EHBP,X'01'              .SET ERROR BYPASS BIT ON
    3167 C0 87 54FE            4517         B     DOMICR                  .GO EXECUTE MICROPROGRAM
    316B 88               316B 4518         DC    XL1'88'                 .ERROR HALT  -88-
    316C 5037             316D 4519 R22EX1  DC    XL2'5037'               .EXPECTED END OF TEST
    316E 4D 01 1B 5FE6         4520         CLC   R22EX1(2,XR1),STATAC    .TEST FOR ACTUAL END OF TEST
    3173 F2 81 04              4521         JE    R22B01                  .JUMP IF SO
    3176 C0 87 525A            4522         B     PIOREG                  .ERROR GO PRINT I/O REG
                              4523
    317A C0 87 0216            4524 R22B01  B     LINK                    .GO TO NEXT ROUTINE
                              4525
    317E D9D6E4E340F2C440 3196 4526 RT22OP  DC    CL25'ROUT 2D XMIT/REC ALT BITS'
    3186 E7D4C9E361D9C5C3      4526
    318E 40C1D3E340C2C9E3      4526
    3196 E2                    4526
    3197 0155             3198 4527 X0155   DC    XL2'0155'               .ALTERNATE BIT PATTERN
                              4528
                              4528
                              4529 ************************************************************************
                              4530 *      ROUTINE 2E - TRANSMIT ZEROES TEST                               *
                              4531 ************************************************************************
                              4532 *                                                                      *
                              4533 *      THIS ROUTINE CHECKS SSN 0 WHICH CAUSES THE ATTACHMENT TO        *
                              4534 *      TRANSMIT 13 ZEROES INSTEAD OF THE DATA IN THE I/O REGISTER.     *
                              4535 *      SSN 0 IS TURNED ON AND THE I/O REG IS LOADED TWICE.  AT THE     *
                              4536 *      END OF 13 CYCLES RECEIVE WORD READY IS CHECKED TO ASSURE IT     *
                              4537 *      DID NOT COME ON (INDICATES ALL ZEROES TRANSMITTED).  THEN,      *
                              4538 *      13MORE CYCLES LATER RECEIVE WORD READY MUST COME ON AND THE     *
                              4539 *      WORD RECEIVED IS CHECKED TO BE SURE IT IS THE SAME AS THE       *
                              4540 *      ONE TRANSMITTED.  THIS ROUTINE IS DONE BY WRAPPING IN DIAG-     *
                              4541 *      NOSTIC MODE.                                                    *
                              4542 *                                                                      *
                              4543 ************************************************************************
                              4544
    3199 2E               3199 4545 RT2E    DC    XL1'2E'                 ROUTINE NUMBER
    319A 00               319A 4546         DC    XL1'00'                 NO MANUAL INTERVENTION
    319B 3244             319C 4547         DC    AL2(RT2F)               ADDRESS OF NEXT ROUTINE
                              4548
                          31A9 4549         USING R23K01,XR1
    319D C2 01 31A9            4550         LA    R23K01,XR1              INITIALIZE XR1 FOR INDEXING
                              4551
    31A1 C0 87 021A            4552         B     PRINT                   PRINT ROUTINE HEADING
    31A5 01               31A5 4553         DC    XL1'01'
    31A6 13               31A6 4554         DC    IL1'19'
    31A7 3103             31A8 4555         DC    AL2(RT23CP)
                              4556
    31A9 C0 87 5918            4557 R23K01  B     LOADCS                  .GO LOAD MICROPROGRAM
    31AD 83               31AD 4558         DC    XL1'83'                 .DISABLE UPON ENTRY, FILL 2ND
                              4559 *                                       FSQ WITH BOS,0 ON ADDRESS
    31AE 31D4             31AF 4560         DC    AL2(R23MCS)             .START OF MICRO CODE
    31B0 3243             31B1 4561         DC    AL2(R23MCE)             .END OF MICROCODE
                              4562
    31B2 3C 20 5564            4563         MVI   LPCNT,X'20'             .INCREASE MICRO DELAY TIME
    31B6 C0 87 54FE            4564         B     DOMICR                  .GO EXECUTE MICROPROGRAM
    31BA 8A               31BA 4565         DC    XL1'8A'                 .ERROR HALT  -8A-
    31BB 5033             31BC 4566         DC    XL2'5033'               .EXPECTED DATA
                              4567
    31BD C0 87 0216            4568         B     LINK                    .GO TO NEXT ROUTINE
                              4569
    31C1 D9D6E4E340F2C540 31D3 4570 RT23OP  DC    CL19'ROUT 2E XMIT ZEROES'
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   31C9 E7D4C9E340E9C5D9      4570
   31D1 D6C5E2                4570
                              4571
                         31D4 4572 R23MCS EQU   *
   31D4 5034             31D5 4573         DC    XL2'5034'    00  BOS.0  GO SET INSIDE WRAP
   31D6 0B89             31D7 4574         DC    XL2'0B89'    01  LE. DESELECT ALL LINES
   31D8 7300             31D9 4575         DC    XL2'7300'    02  IC. SET COUNTER (HDB 03) TO ZERO
   31DA 1008             31DB 4576         DC    XL2'1008'    03  SSF.0  RESET I/O REG BITS 2,3,13
   31DC 7FAA             31DD 4577         DC    XL2'7FAA'    04  IC. SET HDB 0F = AA (BITS TO BE XMITTED)
   31DE 7400             31DF 4578         DC    XL2'7400'    05  IC. RESET HDB 04 (RECEIVE REG.)
   31E0 1304             31E1 4579         DC    XL2'1304'    06  SSN.3  SET BIT 3 OF I/O REG ON
   31E2 1F04             31E3 4580         DC    XL2'1F04'    07  SSN.F  SET DIAGNOSTIC MODE ON
   31E4 1004             31E5 4581         DC    XL2'1004'    08  SSN.0  SET XMIT ZEROES ON
   31E6 078F             31E7 4582         DC    XL2'078F'    09  LOAD I/O REG & XMIT 13 ZEROES
   31E8 500B             31E9 4583         DC    XL2'500B'    0A  BOS.0 WAIT A CYCLE
   31EA 078F             31EB 4584         DC    XL2'078F'    0B  LOAD I/O REG AGAIN TO XMIT DATA
   31EC 400E             31ED 4585         DC    XL2'400E'    0C  TSN.0  MUST BRANCH (XMIT WD RDY ON)
   31EE 500D             31EF 4586         DC    XL2'500D'    0D  ERROR. HANG
   31F0 41E1             31F1 4587         DC    XL2'41E1'    0E  TSN.1  MUST NOT BRANCH (REC. WD RDY OFF)
   31F2 5010             31F3 4588         DC    XL2'5010'    0F  BOS.0 TO COUNT CYCLES
   31F4 5011             31F5 4589         DC    XL2'5011'    10
   31F6 5012             31F7 4590         DC    XL2'5012'    11
   31F8 5013             31F9 4591         DC    XL2'5013'    12
   31FA 5014             31FB 4592         DC    XL2'5014'    13
   31FC 5015             31FD 4593         DC    XL2'5015'    14
   31FE 5016             31FF 4594         DC    XL2'5016'    15
   3200 5017             3201 4595         DC    XL2'5017'    16
   3202 5018             3203 4596         DC    XL2'5018'    17
   3204 41E2             3205 4597         DC    XL2'41E2'    18  TSN.1  MUST NOT BRANCH
   3206 40E3             3207 4598         DC    XL2'40E3'    19  TSN.0  MUST NOT BRANCH
   3208 41E4             3209 4599         DC    XL2'41E4'    1A  TSN.1  MUST NOT BRANCH
   320A 1008             320B 4600         DC    XL2'1008'    1B  SSF.0  RESET I/O REG BITS 2,3,13
   320C 41E5             320D 4601         DC    XL2'41E5'    1C  TSN.1  MUST NOT BRANCH
   320E 41E6             320F 4602         DC    XL2'41E6'    1D   IN FOLLOWING SEQUENCE OF WORDS
   3210 41E7             3211 4603         DC    XL2'41E7'    1E
   3212 41E8             3213 4604         DC    XL2'41E8'    1F
   3214 41E9             3215 4605         DC    XL2'41E9'    20
   3216 41EA             3217 4606         DC    XL2'41EA'    21
   3218 41EB             3219 4607         DC    XL2'41EB'    22
   321A 41EC             321B 4608         DC    XL2'41EC'    23
   321C 4127             321D 4609         DC    XL2'4127'    24  TSN.1 MUST BE ON (REC. WD RDY.)
   321E 5025             321F 4610         DC    XL2'5025'    25  DUMMY WORD
   3220 5026             3221 4611         DC    XL2'5026'    26  ERROR. HANG
   3222 0444             3223 4612         DC    XL2'0444'    27  LE. EMPTY I/O REG
   3224 41EE             3225 4613         DC    XL2'41EE'    28  TSN.1 MUST NOT BRANCH AGAIN
   3226 42EF             3227 4614         DC    XL2'42EF'    29  TSN.2 MUST NOT BRANCH (I/O REG 2 OFF)
   3228 432C             3229 4615         DC    XL2'432C'    2A  TSN.3 MUST BRANCH (I/O REG 3 ON)
   322A 502B             322B 4616         DC    XL2'502B'    2B  ERROR. HANG
   322C B40F             322D 4617         DC    XL2'B40F'    2C  CIR. CHECK DATA SAME AS XMITTED
   322E 9C2F             322F 4618         DC    XL2'9C2F'    2D  BOS.3  MUST BRANCH
   3230 502E             3231 4619         DC    XL2'502E'    2E  ERROR. HANG
   3232 4BFF             3233 4620         DC    XL2'4BFF'    2F  TSN.B  REC. CHK. MUST BE OFF
   3234 1310             3235 4621         DC    XL2'1310'    30  INC.  INCR. COUNTER
   3236 9C33             3237 4622         DC    XL2'9C33'    31  BOC.3  BRANCH IF TEST OVER
   3238 5008             3239 4623         DC    XL2'5008'    32  BOS.0  RESTART TEST
   323A 5033             323B 4624         DC    XL2'5033'    33  HANG. TEST COMPLETED OKAY
   323C 1E04             323D 4625         DC    XL2'1E04'    34  SSN.E  TURN ON INSIDE WRAP
   323E 7900             323F 4626         DC    XL2'7900'    35  IC.  PUT 00 IN HDB 9 TO DESELECT LINES
   3240 0A89             3241 4627         DC    XL2'0A89'    36  LE.DESELECT ALL ALT LINES.
   3242 5001             3243 4628 R23MCE  DC    XL2'5001'    37  BOS.0  RETURN TO ADDRESS 001
                              4629
                              4630 ********************************************************************************
                              4631 *      ROUTINE 2F - RECEIVE CHECK TESTS                                        *
                              4632 ********************************************************************************
                              4633 *                                                                              *
                              4634 *      THIS ROUTINE TESTS THAT THE PARITY CHECK CIRCUITS ON THE DATA            *
                              4635 *      RECEIVED BY THE I/O REG ARE WORKING PROPERLY.  THIS IS DONE BY           *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              4636 *      PUTTING THE ATTACHMENT IN DIAGNOSTIC MODE AND ACTIVATING SSN 6 *
                              4637 *      WHICH BLOCKS THE PARITY BIT ON THE WORD TRANSMITTED THEREBY    *
                              4638 *      CAUSING A PARITY CHECK IF BIT 12 SHOULD HAVE BEEN ON.  ALL     *
                              4639 *      BITS ARE USED IN BOTH THEIR 0 AND 1 STATES.                    *
                              4640 *                                                                     *
                              4641 ********************************************************************************
                              4642
   3244 2F                3244 4643 RT2F   DC    XL1'2F'      ROUTINE NUMBER
   3245 00                3245 4644        DC    XL1'00'      NO MANUAL INTERVENTION
   3246 32EB              3247 4645        DC    AL2(RT30)    ADDRESS OF NEXT ROUTINE
                              4646
                         3254 4647        USING R24K01,XR1
   3248 C2 01 3254             4648        LA    R24K01,XR1   INITIALIZE XR1 FOR INDEXING
                              4649
   324C C0 87 021A             4650        B     PRINT        PRINT ROUTINE HEADING
   3250 01                3250 4651        DC    XL1'01'
   3251 17                3251 4652        DC    IL1'23'
   3252 3282              3253 4653        DC    AL2(RT24CP)
                              4654
   3254 C0 87 5918            4655 R24K01 B     LOADCS       .GO LOAD MICROPROGRAM
   3258 83                3258 4656        DC    XL1'83'      .DISABLE UPON ENTRY. FILL 2ND
                              4657 *                           FSQ WITH BCS,0 ON ADDRESS
   3259 3283              325A 4658        DC    AL2(R24MCS)  .START OF MICRO CODE
   325B 32EA              325C 4659        DC    AL2(R24MCE)  .END OF MICROCODE
                              4660
   325D 3C 0F 5564            4661        MVI   LPCNT,X'0F'  .INCREASE MICROPROGRAM DELAY
   3261 C0 87 54FE            4662        B     DOMICR       .GO EXECUTE MICROPROGRAM
   3265 8E                3265 4663        DC    XL1'8E'      .ERROR HALT  -8E-
   3266 502F              3267 4664        DC    XL2'502F'    .EXPECTED DATA
                              4665
   3268 C0 87 0216            4666        B     LINK         .GO TO NEXT ROUTINE
                              4667
   326C D9D6E4E340F2C640 3282 4668 RT24OP DC    CL23'ROUT 2F TEST REC. CHECK'
   3274 E3C5E2E340D9C5C3      4668
   327C 4B40C3C8C5C3D2        4668
                              4669
                              4670 *-----------------------------*
                              4671 * START OF MICROPROGRAM LISTING *
                              4672 *-----------------------------*
   3283 5030              3283 4673 R24MCS EQU   *
   3285 0B89              3284 4674        DC    XL2'5030'    00  BOS.0  GO SET INSIDE WRAP
   3287 7300              3286 4675        DC    XL2'0B89'    01  DESELECT LINES
   3289 1008              3288 4676        DC    XL2'7300'    02  IC. SET COUNTER TO ZERO
   328B 1508              328A 4677        DC    XL2'1008'    03  SSF.0  RESET I/O REG BITS 2,3,13
   328D 74AA              328C 4678        DC    XL2'1508'    04  SSF.5  RESET REC. CHK.
   328F 1F04              328E 4679        DC    XL2'74AA'    05  IC. SET HDB 4 TO XMIT 1ST PATTERN
   3291 1604              3290 4680        DC    XL2'1F04'    06  SSN.F SET DIAGNOSTIC MODE
   3293 1204              3292 4681        DC    XL2'1604'    07  SSN.6 SET BLOCK BIT 12 (PARITY)
   3295 0784              3294 4682        DC    XL2'1204'    08  SSN.2  TURN ON BIT 2 OF I/O REG
   3297 410C              3296 4683        DC    XL2'0784'    09  LE. LOAD I/O REG & XMIT WORD
   3299 500A              3298 4684        DC    XL2'410C'    0A  TSN.1 WAIT FOR REC. WD. RDY ON
   329B 480E              329A 4685        DC    XL2'500A'    0B  BOS.0 BRANCH BACK
   329D 500D              329C 4686        DC    XL2'480E'    0C  TSN.B REC. CHK MUST BE ON
   329F 1508              329E 4687        DC    XL2'500D'    0D  ERROR. HANG
   32A1 4BE1              32A0 4688        DC    XL2'1508'    0E  SSF.5 RESET RECEIVE CHK.
   32A3 0644              32A2 4689        DC    XL2'4BE1'    0F  TSN.B MUST NOT BRANCH
   32A5 1008              32A4 4690        DC    XL2'0644'    10  LE. PUT I/O REG IN HDB 06
   32A7 1604              32A6 4691        DC    XL2'1008'    11  SSF.0  RESET I/O REG 2,3,13
   32A9 7555              32A8 4692        DC    XL2'1604'    12  SSN.6  SET BLOCK BIT 12 (PARITY)
   32AB 1304              32AA 4693        DC    XL2'7555'    13  SET HDB 5 TO NEW PATTERN
   32AD 0785              32AC 4694        DC    XL2'1304'    14  SSN.3  SET BIT 3 OF I/O REG
   32AF 4118              32AE 4695        DC    XL2'0785'    15  LE.  LOAD I/O REG WITH NEW PATTERN
   3281 5016              3280 4696        DC    XL2'4118'    16  TSN.1  WAIT FOR REC WD RDY TO COME ON
   3283 0644              3282 4697        DC    XL2'5016'    17  BOS.0  LOOP BACK TO PREV. WD
   3285 481B              3284 4698        DC    XL2'0644'    18  LE. UNLOAD I/O REG TO HDB 6
   3287 501A              3286 4699        DC    XL2'481B'    19  TSN.B  REC. CHK. MUST BE ON
   3289 1508              3288 4700        DC    XL2'501A'    1A  ERROR. HANG
                          328A 4701        DC    XL2'1508'    1B  SSF.5  RESET REC. CHK.
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3288 4BE2             328C 4702         DC    XL2'4BE2'    1C  TSN.8  MUST NOT BRANCH NOW
                              4703 *
   328D 501E             328E 4704         DC    XL2'501E'    1D  DUMMY WORD
   328F 1008             32C0 4705         DC    XL2'1008'    1E  SSF.0  RESET I/O REG 2,3,13
   32C1 1204             32C2 4706         DC    XL2'1204'    1F  SSN.2 TURN BIT 2 OF I/O REG ON
   32C3 0784             32C4 4707         DC    XL2'0784'    20  LE. LOAD I/O REG & XMIT WD
   32C5 4123             32C6 4708         DC    XL2'4123'    21  TSN.1  WAIT FOR REC. WD. RDY
   32C7 5021             32C8 4709         DC    XL2'5021'    22  BOS.0  BRANCH BACK
   32C9 4BE3             32CA 4710         DC    XL2'4BE3'    23  TSN.8  MUST NOT BRANCH
   32CB 43E4             32CC 4711         DC    XL2'43E4'    24  TSN.3  MUST NOT BRANCH
   32CD 4AE5             32CE 4712         DC    XL2'4AE5'    25  TSN.A  MUST NOT BRANCH
   32CF 4228             32D0 4713         DC    XL2'4228'    26  TSN.2  MUST BRANCH
   32D1 5027             32D2 4714         DC    XL2'5027'    27  ERROR, HANG
   32D3 0644             32D4 4715         DC    XL2'0644'    28  LE. UNLOAD I/O REG IN HDB 06
   32D5 8406             32D6 4716         DC    XL2'8406'    29  CIR, CHECK FOR EXPECTED RESULT
   32D7 9C2C             32D8 4717         DC    XL2'9C2C'    2A  BOC.3 BRANCH IF OKAY
   32D9 502B             32DA 4718         DC    XL2'502B'    2B  ERROR, HANG
   32DB 1310             32DC 4719         DC    XL2'1310'    2C  INC. INCREMENT COUNTER
   32DD 942F             32DE 4720         DC    XL2'942F'    2D  BOC,2 EXIT AFTER 16 TIMES
   32DF 5003             32E0 4721         DC    XL2'5003'    2E  BOS.0 RESTART TEST
   32E1 502F             32E2 4722         DC    XL2'502F'    2F  HANG, TEST COMPLETED OKAY
   32E3 1E04             32E4 4723         DC    XL2'1E04'    30  SSN.E  TURN ON INSIDE WRAP
   32E5 7900             32E6 4724         DC    XL2'7900'    31  IC,  PUT 00 IN HDB 9 TO DESELECT LINES
   32E7 0A89             32E8 4725         DC    XL2'0A89'    32  LE.DESELECT ALL ALT LINES.
   32E9 5001             32EA 4726 R24MCE  DC    XL2'5001'    33  BOS,0  RETURN TO ADDRESS 001
                              4727
                              4727
                              4728 ********************************************************************************
                              4729 *      ROUTINE 30 -  CURAR SET DURING RECEIVE DATA MODE                        *
                              4730 ********************************************************************************
                              4731 *                                                                              *
                              4732 *      THIS ROUTINE TESTS THAT WHEN THE ATTACHMENT IS RECEIVING DATA           *
                              4733 *      WITH SSN B (RECEIVE DATA MODE) ACTIVATED, MBAR WILL BE                  *
                              4734 *      MOVED TO CURAR WHEN THE CURSOR BIT (BIT 3) IS RECEIVED.                 *
                              4735 *      THE VALUES OF MBAR MOVED ARE 5AA AND 255.  CURAR IS THEN RESET          *
                              4736 *      TO ZERO AND RECEIVE DATA MODE (TSN B) IS TURNED OFF.  THE               *
                              4737 *      TEST IS THEN REPEATED TO BE SURE MBAR DOES NOT GET TRANSFERRED          *
                              4738 *      TO CURAR IN THIS CASE.                                                  *
                              4739 *                                                                              *
                              4740 ********************************************************************************
                              4741
   32EB 30               32EB 4742 RT30    DC    XL1'30'      ROUTINE NUMBER
   32EC 00               32EC 4743         DC    XL1'00'      NO MANUAL INTERVENTION
   32ED 33F5             32EE 4744         DC    AL2(RT31)    ADDRESS OF NEXT ROUTINE
                              4745
                         32FB 4746         USING R25K01,XR1
   32EF C2 01 32FB            4747         LA    R25K01,XR1   INITIALIZE XR1 FOR INDEXING
                              4748
   32F3 C0 87 021A            4749         B     PRINT        PRINT ROUTINE HEADING
   32F7 01               32F7 4750         DC    XL1'01'
   32F8 21               32F8 4751         DC    IL1'33'
   32F9 3350             32FA 4752         DC    AL2(RT250P)
                              4753
   32FB C0 87 5918            4754 R25K01 B     LOADCS       .GO LOAD MICROPROGRAM
   32FF 83               32FF 4755         DC    XL1'83'      .DISABLE UPON ENTRY, FILL 2ND
                              4756 *                           FSO WITH BOS,0 ON ADDRESS
   3300 3351             3301 4757         DC    AL2(R25MCS)  .START OF MICRO CODE
   3302 33F4             3303 4758         DC    AL2(R25MCE)  .END OF MICROCODE
                              4759
   3304 0C 01 5564 31 98      4760         MVC   LPCNT,X0185(2) .EXTEND MICROPROGRAM DELAY
   330A C0 87 54FE            4761         B     DOMICR       .GO EXECUTE MICROPROGRAM
   330E 90               330E 4762         DC    XL1'90'      .ERROR HALT  -90-
   330F 503B             3310 4763         DC    XL2'503B'    .EXPECTED DATA
                              4764
   3311 30 4D 5FE6            4765         SNS   STATAC,HDB5  .SENSE ACTUAL CURAR
   3315 F3 58 80              4766         SIO   X'80',SIOI  .DISABLE ATTACHMENT
   3318 30 49 3328            4767         SNS   R25EX1,HDB1  .SENSE EXPECTED DATA
   331C 1D 01 5FE6 30         4768         CLC   STATAC,R25EX1(2,XR1) .COMPARE FOR EXPECTED
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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3321 F2 81 08              4769         JE    R25B01       .JUMP IF OKAY
                              4770
   3324 C0 87 5DA5            4771 R25ERR B     STATUS       .ERROR, GO PRINT OUT
   3328 08               3328 4772         DC    XL1'08'      .PRINT CURAR ERROR MESSAGE
   3329 91               3329 4773         DC    XL1'91'      .ERROR HALT  -91-
   332A 0000             332B 4774 R25EX1 DC    XL2'0'       .EXPECTED DATA GETS FILLED IN
                              4775
   332C C0 87 0216            4776 R25B01 B     LINK         .GO TO NEXT ROUTINE
                              4777
   3330 D9D6E4E340F3F640 3350 4778 RT250P DC    CL33'ROUT 30 CURAR SET DURING REC DATA'
   3338 C3E4D9C1D940E2C5      4778
   3340 E340C4E4D9C9D5C7      4778
   3348 40D9C5C340C4C3E3      4778
   3350 C1                    4778
                              4779
                              4780 *-------------------------------*
                              4781 * START OF MICROPROGRAM LISTING *
                              4782 *-------------------------------*
                         3351 4783 R25MCS EQU   *
   3351 504E             3352 4784         DC    XL2'504E'    00  BOS.0 GO SET INSIDE WRAP
   3353 0889             3354 4785         DC    XL2'0889'    01  LE. DESELECT ALL LINES
   3355 7000             3356 4786         DC    XL2'7000'    02  IC. SET MBAR HI = 0
   3357 7100             3358 4787         DC    XL2'7100'    03  IC. SET MBAR LO = 0
   3359 1704             335A 4788         DC    XL2'1704'    04  SSN,7 RESET CURAR
   335B 7205             335C 4789         DC    XL2'7205'    05  IC. SET HDB 02 TO 1ST EXP. VALUE
   335D 73AA             335E 4790         DC    XL2'73AA'    06  IC. SET HDB 03 TO 1ST EXP. VALUE
   335F 76F1             3360 4791         DC    XL2'76F1'    07  IC. SET DATA XMITTED TO F1
   3361 1F04             3362 4792         DC    XL2'1F04'    08  SSN,F  SET DIAGNOSTIC MODE
   3363 1B04             3364 4793         DC    XL2'1B04'    09  SSN.B  SET REC. DATA MODE
   3365 1008             3366 4794         DC    XL2'1008'    0A  SSF.0  RESET I/O REG BITS 2,3,13
   3367 0786             3368 4795         DC    XL2'0786'    0B  LE. LOAD I/O REG & XMIT WORD
   3369 410E             336A 4796         DC    XL2'410E'    0C  TSN.1 WAIT FOR REC. WD. RDY
   3368 500C             336C 4797         DC    XL2'500C'    0D  BOS.0 LOOP BACK
   3360 0744             336E 4798         DC    XL2'0744'    0E  LE. EMPTY I/O REG TO HDB 7
   336F 1110             3370 4799         DC    XL2'1110'    0F  INC. INCR. MBAR LO
   3371 9C33             3372 4800         DC    XL2'9C33'    10  BOC.3 BRANCH IF MBAR HI NEEDS INC.
   3373 B200             3374 4801         DC    XL2'B200'    11  CIR, CHECK FOR MATCH
   3375 9C14             3376 4802         DC    XL2'9C14'    12  BOC.3  BRANCH IF HI MATCH
   3377 5018             3378 4803         DC    XL2'5018'    13  BOS.0 IF NOT BRANCH TO CHECK MBAR
   3379 B301             337A 4804         DC    XL2'B301'    14  CIR, CHECK FOR LO MATCH
   337B 9C17             337C 4805         DC    XL2'9C17'    15  BOC.3 IF MATCH, SET BIT 3
   337D 5018             337E 4806         DC    XL2'5018'    16  BOS.0  NO MATCH CHECK MBAR
   337F 503C             3380 4807         DC    XL2'503C'    17  BOS.0 BRANCH TO SET BIT 3 (CURSOR)
   3381 E007             3382 4808         DC    XL2'E007'    18  CI. CHECK MBAR HI = 07
   3383 9C1B             3384 4809         DC    XL2'9C1B'    19  BOC.3 IF SO CHECK MBAR LO
   3385 500A             3386 4810         DC    XL2'500A'    1A  BOS.0 RETURN TO LOOP
   3387 E1E0             3388 4811         DC    XL2'E1E0'    1B  CI. CHECK MBAR LO = E0
   3389 9C1E             338A 4812         DC    XL2'9C1E'    1C  BOC.3 IF SO, END LOOP
   3388 500A             338C 4813         DC    XL2'500A'    1D  BOS.0 RETURN TO LOOP
   338D 5041             338E 4814         DC    XL2'5041'    1E  BOS.0 GO CHECK CURAR VALUE & SET HDB 1A-1B
   338F 501F             3390 4815         DC    XL2'501F'    1F DUMMY WORD
   3391 B21A             3392 4816         DC    XL2'821A'    20  CIR, CHECK FOR CORRECT VALUE
   3393 9C23             3394 4817         DC    XL2'9C23'    21  BOC,3  BRANCH IF MATCH
   3395 5025             3396 4818         DC    XL2'5025'    22  BOS.0 BRANCH TO CHECK MISCOMPARE VALID
   3397 B31B             3398 4819         DC    XL2'831B'    23  CIR, CHECK FOR CORRECT VALUE LO
   3399 9C26             339A 4820         DC    XL2'9C26'    24  BOC.3  BRANCH IF CORRECT
   3398 5035             339C 4821         DC    XL2'5035'    25  BOS.0 CHECK FOR VALID MISCOMPARE
   339D E355             339E 4822         DC    XL2'E355'    26  CI. CHECK FOR 2ND OR 3RD PASS
   339F 9C3E             33A0 4823         DC    XL2'9C3E'    27  BOC.3 BRANCH IF SO
   33A1 7000             33A2 4824         DC    XL2'7000'    28  IC. RESET MBAR HI
   33A3 7100             33A4 4825         DC    XL2'7100'    29  IC. RESET MBAR LO
   33A5 7202             33A6 4826         DC    XL2'7202'    2A  IC. SET NEW MATCH VALUE
   33A7 7355             33A8 4827         DC    XL2'7355'    2B  IC. SET NEW MATCH VALUE LO
   33A9 500A             33AA 4828         DC    XL2'500A'    2C  BOS.0 RESTART WITH NEW VALUE
   33AB 76F2             33AC 4829         DC    XL2'76F2'    2D  IC, CHANGE DATA VALUE TO F2
   33AD 7000             33AE 4830         DC    XL2'7000'    2E  IC. RESET MBAR HI
   33AF 7100             33B0 4831         DC    XL2'7100'    2F  IC,RESET MBAR LO
   33B1 1704             33B2 4832         DC    XL2'1704'    30  SSN.7  RESET CURAR
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    3383 1808            3384 4833        DC     XL2'1808'   31  SSF.B  RESET REC. DATA MODE
    3385 500A            3386 4834        DC     XL2'500A'   32  BOS.0 GO RESTART LOOP
    3387 1010            3388 4835        DC     XL2'1010'   33  INC. INCR. MEAR HI
    3389 5011            338A 4836        DC     XL2'5011'   34  BOS.0 RETURN TO LOOP
    3388 E6F2            338C 4837        DC     XL2'E6F2'   35  CI. CHECK DATA = F2
    338D 9C38            338E 4838        DC     XL2'9C38'   36  BOC.3 IF SO ERROR MAY BE LEGIT.
    338F 503B            33C0 4839        DC     XL2'503B'   37  ERROR. BUT GO TO END ANYHOW
    33C1 7200            33C2 4840        DC     XL2'7200'   38  IC. SET HI EXP RESULT TO ZERO
    33C3 7300            33C4 4841        DC     XL2'7300'   39  IC. SET LO EXP RESULT TO ZERO
    33C5 1F08            33C6 4842        DC     XL2'1F08'   3A  SSF. RESET DIAGNOSTIC MODE
    33C7 503B            33C8 4843        DC     XL2'503B'   3B  HANG. TEST IS COMPLETED
    33C9 1304            33CA 4844        DC     XL2'1304'   3C  SSN. TURN ON BIT 3 OF I/O REG
    33CB 500B            33CC 4845        DC     XL2'500B'   3D  BOS.0  RETURN AND XMIT CURSOR BIT
    33CD E6F2            33CE 4846        DC     XL2'E6F2'   3E  CI. CHECK FOR 3RD PASS
    33CF 9C38            33D0 4847        DC     XL2'9C38'   3F  BOC.3 GO TERMINATE IF SO
    33D1 502D            33D2 4848        DC     XL2'502D'   40  BOS.0  GO DO 3RD PASS
    33D3 7000            33D4 4849        DC     XL2'7000'   41  IC. SET MBAR HI = 00
    33D5 7100            33D6 4850        DC     XL2'7100'   42  IC. SET MBAR LO = 00
    33D7 544A            33D8 4851        DC     XL2'544A'   43  BOS.1 BRANCH IF MBAR = CURAR
    33D9 1110            33DA 4852        DC     XL2'1110'   44  INC.  INCR. MBAR LO
    33DB 9043            33DC 4853        DC     XL2'9043'   45  BOC.0 BRANCH BACK IF NOT ZERO
    33DD 1010            33DE 4854        DC     XL2'1010'   46  INC.  INCR. MBAR HI
    33DF E080            33E0 4855        DC     XL2'E080'   47  CI.  TEST FOR END OF MBAR
    33E1 9C4D            33E2 4856        DC     XL2'9C4D'   48  BOC.3 BRANCH IF ERROR
    33E3 5043            33E4 4857        DC     XL2'5043'   49  BOS.0 BRANCH BACK
    33E5 2A20            33E6 4858        DC     XL2'2A20'   4A  LR. LOAD HI CURAR HDE 1A
    33E7 2B21            33E8 4859        DC     XL2'2B21'   4B  LR. LOAD LO CURAR HDB 1B
    33E9 5020            33EA 4860        DC     XL2'5020'   4C  BOS.0  RETURN TO MAIN LOOP
    33EB 504D            33EC 4861        DC     XL2'504D'   4D  BOS.0  ERROR. HANG NO MATCH FOUND
    33ED 1E04            33EE 4862        DC     XL2'1E04'   4E  SSN.E  TURN ON INSIDE WRAP
    33EF 7900            33F0 4863        DC     XL2'7900'   4F  IC.  PUT 00 IN HDB 9 TO DESELECT LINES
    33F1 0A89            33F2 4864        DC     XL2'0A89'   50  LE,DESELECT ALL ALT LINES.
    33F3 5001            33F4 4865 R25MCE DC     XL2'5001'   51  BOS.0  RETURN TO ADDRESS 001
                              4866
                              4866
                              4867 *************************************************************
                              4868 *      ROUTINE 31 - TEST XMIT BIT 3 WHEN MBAR = CURAR      *
                              4869 *************************************************************
                              4870 *                                                           *
                              4871 *      THIS ROUTINE ASSURES THAT A CURSOR BIT (BIT 3) IS TRANSMITTED  *
                              4872 *      WHEN CURAR = MEAR.  IT IS DCNE BY TRANSMITTING DATA IN         *
                              4873 *      DIAGNOSTIC MODE AND CHECKING THAT BIT 3 RECEIVED IS ALLWAYS   *
                              4874 *      OFF UNLESS MBAR = CURAR.  ADDRESSES WHERE CURSOR IS INJECTED  *
                              4875 *      ARE SAA AND 255 TO ASSURE THAT ALL BITS IN THE COMPARE        *
                              4876 *      CIRCUITS ARE CHECKED.                                         *
                              4877 *                                                           *
                              4878 *************************************************************
                              4879
    33F5 31              33F5 4880 RT31   DC     XL1'31'                     ROUTINE NUMBER
    33F6 00              33F6 4881        DC     XL1'00'                     NO MANUAL INTERVENTION
    33F7 3498            33F8 4882        DC     AL2(RT32)                   ADDRESS OF NEXT ROUTINE
                              4883
                         3405 4884        USING R26K01.XR1
    33F9 C2 01 3405           4885        LA     R26K01.XR1                  INITIALIZE XR1 FOR INDEXING
                              4886
    33FD C0 87 021A           4887        B      PRINT                       PRINT ROUTINE HEADING
    3401 01              3401 4888        DC     XL1'01'
    3402 1D              3402 4889        DC     IL1'29'
    3403 3438            3404 4890        DC     AL2(RT260P)
                              4891
    3405 C0 87 5918           4892 R26K01 B      LOADCS                      .GO LOAD MICROPROGRAM
    3409 83              3409 4893        DC     XL1'83'                     .DISABLE UPON ENTRY. FILL 2ND
                              4894 *                                          FSQ WITH BOS.0 ON ADDRESS
    340A 343C            340B 4895        DC     AL2(R26MCS)                 .START OF MICRO CODE
    340C 3497            340D 4896        DC     AL2(R26MCE)                 .END OF MICROCODE
                              4897
    340E 0C 01 55E4 3158      4898        MVC    LPCNT.X0155(2)              .INCREASE MICROPROGRAM DELAY
    3414 C0 87 54FE           4899        B      DOMICR                      .GO DO MICRORROGRAM
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    3418 93              3418 4900        DC     XL1'93'                     .ERROR HALT  -93-
    3419 5027            341A 4901        DC     XL2'5027'                   .EXPECTED DATA
                              4902
    341B C0 87 0216           4903        B      LINK                        .GO TO NEXT ROUTINE
                              4904
    341F D9D6E4E340F3F140 3438 4905 RT260P DC    CL29'ROUT 31 XMIT BIT 3 FROM CURAR'
    3427 E7D4C9E340C2C9E3     4905
    342F 40F340C6D9D6D440     4905
    3437 C3E4D9C1D9           4905
                              4906
                              4907 *-------------------------------*
                              4908 * START OF MICROPROGRAM LISTING *
                              4909 *-------------------------------*
                         343C 4910 R26MCS EQU    *
    343C 502A            343D 4911        DC     XL2'502A'   00  GO SET INSIDE WRAP ON
    343E 0889            343F 4912        DC     XL2'0889'   01  LE. DESELECT ALL LINES
    3440 7005            3441 4913        DC     XL2'7005'   02  IC. SET MBAR HI = 05
    3442 71AA            3443 4914        DC     XL2'71AA'   03  IC. SET MBAR LO = AA
    3444 1704            3445 4915        DC     XL2'1704'   04  SSN.7 SET CURAR FROM MBAR
    3446 2200            3447 4916        DC     XL2'2200'   05  LR. SET HDB 02 = MBAR HI
    3448 2301            3449 4917        DC     XL2'2301'   06  LR. SET HDB 03 = MBAR LO
    344A 76F3            344B 4918        DC     XL2'76F3'   07  IC. SET HDB 06 = CHAR TO XMIT
    344C 1F04            344D 4919        DC     XL2'1F04'   08  SSN.F SET DIAGNOSTIC MODE
    344E 7000            344F 4920        DC     XL2'7000'   09  IC. SET MBAR HI = 00
    3450 7100            3451 4921        DC     XL2'7100'   0A  IC. SET MBAR LO = 00
    3452 1008            3453 4922        DC     XL2'1008'   0B  SSF.0  RESET BITS 2.3.13 I/O REG
    3454 0786            3455 4923        DC     XL2'0786'   0C  LE. LCAD I/O REG & XMIT WORD
    3456 410F            3457 4924        DC     XL2'410F'   0D  TSN.1  WAIT FOR REC. WD RDY TO GO ON
    3458 500D            3459 4925        DC     XL2'500D'   0E  BOS.0  BRANCH BACK
    345A 0744            345B 4926        DC     XL2'0744'   0F  LE. PUT I/O REG IN HDB 07
    345C B002            345D 4927        DC     XL2'B002'   10  CIR. CHECK HI MBAR ADDRESS
    345E 9C13            345F 4928        DC     XL2'9C13'   11  BOC.3  BRANCH IF = TO TEST LO
    3460 5015            3461 4929        DC     XL2'5015'   12  BOS.0  NO MATCH. BIT 3 MUST BE OFF
    3462 B103            3463 4930        DC     XL2'B103'   13  CIR. CHECK LO MBAR ADDRESS
    3464 9C17            3465 4931        DC     XL2'9C17'   14  BOC.3  IF EQUAL  BIT 3 MUST BE ON
    3466 43E1            3467 4932        DC     XL2'43E1'   15  TSN.3  MUST NOT BRANCH
    3468 5019            3469 4933        DC     XL2'5019'   16  BOS.0  BRANCH TO INCR. MBAR
    346A 4319            346B 4934        DC     XL2'4319'   17  TSN.3  MUST BRANCH
    346C 5018            346D 4935        DC     XL2'5018'   18  BOS.0  ERROR. HANG
    346E 1110            346F 4936        DC     XL2'1110'   19  INC.  INCR. MBAR LO
    3470 9C28            3471 4937        DC     XL2'9C28'   1A  BOC.3  BRANCH IF HI NEEDS INCR.
    3472 E008            3473 4938        DC     XL2'E008'   1B  CI. CHECK MBAR HI = 08
    3474 9C1E            3475 4939        DC     XL2'9C1E'   1C  BOC.3  IF SO. CHECK LOW
    3476 500B            3477 4940        DC     XL2'500B'   1D  BOS.0  RETURN TO LOOP
    3478 E1E0            3479 4941        DC     XL2'E1E0'   1E  CI. CHECK MBAR LO = E0
    347A 9C21            347B 4942        DC     XL2'9C21'   1F  BOC.3  END OF PHASE IF SO
    347C 500B            347D 4943        DC     XL2'500B'   20  BOS.0  RETURN TO LOOP
    347E E355            347F 4944        DC     XL2'E355'   21  CI. TEST FOR END OF TEST
    3480 9C26            3481 4945        DC     XL2'9C26'   22  BRANCH IF SO
    3482 7002            3483 4946        DC     XL2'7002'   23  IC. SET MBAR HI = 02 FOR NEXT PHASE
    3484 7155            3485 4947        DC     XL2'7155'   24  IC. SET MBAR LO = 55 FOR NEXT PHASE
    3486 5004            3487 4948        DC     XL2'5004'   25  BOS.0  BRANCH BACK TO DO NEXT PHASE
    3488 1F08            3489 4949        DC     XL2'1F08'   26  SSF.  RESET DIAGNOSTIC MODE
    348A 5027            348B 4950        DC     XL2'5027'   27  HANG. TEST IS COMPLETED OKAY
    348C 1010            348D 4951        DC     XL2'1010'   28  INC.  INCR. MBAR HI
    348E 500B            348F 4952        DC     XL2'500B'   29  RETURN TO LOOP
    3490 1E04            3491 4953        DC     XL2'1E04'   2A  SSN.E  TURN ON INSIDE WRAP
    3492 7900            3493 4954        DC     XL2'7900'   2B  IC.  PUT 00 IN HDB 9 TO DESELECT LINES
    3494 0A89            3495 4955        DC     XL2'0A89'   2C  LE,DESELECT ALL ALT LINES.
    3496 5001            3497 4956 R26MCE DC     XL2'5001'   2D  BOS.0  RETURN TO ADDRESS 001
                              4957
                              4957
                              4958 *************************************************************
                              4959 *      ROUTINE 32 - ATTACHMENT RESET TESTS                  *
                              4960 *************************************************************
                              4961 *                                                           *
                              4962 *      THIS ROUTINE TESTS THAT VARIOUS LINES AND SIGNALS ARE RESET   *
                              4963 *      BY ATTACHMENT RESET.  THIS IS DONE IN TWO PHASES.  THE FIRST  *
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         4964 *      PHASE SETS UP THE VARIOUS SIGNALS.  AN ATTACHMENT RESET IS      *
                         4965 *      THEN GIVEN AND THE SECOND PHASE OF THE MICROPROGRAM TESTS THAT  *
                         4966 *      THE LINES WERE PROPERLY RESET.  THE LINES TESTED ARE:           *
                         4967 *            SSN F DIAGNOSTIC MODE                                     *
                         4968 *            TSN 0 TRANSMIT WORD READY                                 *
                         4969 *            TSN 1 RECEIVE WORD READY                                  *
                         4970 *            SSN B RECEIVE DATA MODE                                   *
                         4971 *            SSN D INTERRUPT REQUEST                                   *
                         4972 *                                                                      *
                         4973 ************************************************************************
                         4974
  3498 32                3498 4975 RT32   DC    XL1'32'          ROUTINE NUMBER
  3499 00                3499 4976        DC    XL1'00'          NO MANUAL INTERVENTION
  349A 355A              349B 4977        DC    AL2(RT33)        .ADDRESS OF NEXT ROUTINE
                              4978
                         34A8 4979        USING R29K01,XR1       INITIALIZE XR1 FOR INDEXING
  349C C2 01 34A8              4980        LA    R29K01,XR1
                               4981
  34A0 C0 87 021A              4982        B     PRINT            PRINT ROUTINE HEADING
  34A4 01                34A4 4983        DC    XL1'01'
  34A5 12                34A5 4984        DC    IL1'18'
  34A6 34DD              34A7 4985        DC    AL2(RT29CP)
                               4986
  34A8 C0 87 5918              4987 R29K01 B     LOADCS           .GO LOAD MICROPROGRAM
  34AC 83                34AC 4988        DC    XL1'83'          .DISABLE UPON ENTRY. FILL 2ND
                               4989 *                             FSQ WITH BCS,0 ON ADDRESS
  34AD 34DE              34AE 4990        DC    AL2(R29MCS)      .START OF MICRO CODE
  34AF 3559              34B0 4991        DC    AL2(R29MCE)      .END OF MICROCODE
                               4992
  34B1 31 48 0D62              4993        LIO   ZERO,HDB0        .SET HDB 10-11 = 0
  34B5 F3 58 E0                4994        SIO   X'E0',SIOI       .START MICROPROGRAM
  34B8 0D 12 34A8 34A8         4995        CLC   R29K01(15),R29K01 .DELAY 42 CYCLES
  34BE F3 58 80                4996        SIO   X'80',SIOI       .DISABLE ATTACHMENT (RESET)
                               4997
  34C1 C0 87 54FE              4998        B     DOMICR           .GO DO SECOND PART OF MICRO
  34C5 99                34C5 4999        DC    XL1'99'          .ERROR HALT -99-
  34C6 5036              34C7 5000        DC    XL2'5036'        .EXPECTED RESULT
                               5001
  34C8 C0 87 0216              5002        B     LINK             .GO TO NEXT ROUTINE
                               5003
  34CC D9D6E4E340F3F240 34DD   5004 RT29OP DC    CL18'ROUT 32 ATTACH RST'
  34D4 C1E3E3C1C3C84D9         5004
  34DC E2E3                    5004
                               5005
                               5006 *-------------------------------*
                               5007 * START OF MICROPROGRAM LISTING *
                               5008 *-------------------------------*
                         34DE 5009 R29MCS EQU   *
  34DE 5037                    5010        DC    XL2'5037'   00  BOS,0 GO TO ADD,37
  34E0 7900                    5011        DC    XL2'7900'   01  IC, SET HDB 09 TO DE-SELECT
  34E2 0A89                    5012        DC    XL2'0A89'   02  LE, DE-SELECT FIRST DR/RC
  34E4 F2FF                    5013        DC    XL2'F2FF'   03  TBN, CHECK HDB 02 FOR 2ND PHASE (FF)
  34E6 9C1C                    5014        DC    XL2'9C1C'   04  BOC,3 IF SO BRANCH TO 2ND PHASE
  34E8 72FF                    5015        DC    XL2'72FF'   05  IC, SET HDB 2 TO FF
  34EA 2022                    5016        DC    XL2'2022'   06  LR, SET HDB 10 TO FF
  34EC 7000                    5017        DC    XL2'7000'   07  IC, SET MBAR HI = 00
  34EE 7100                    5018        DC    XL2'7100'   08  IC, SET MBAR LO = 00
  34F0 1804                    5019        DC    XL2'1804'   09  SSN,B  SET REC, DATA MODE
  34F2 500B                    5020        DC    XL2'500B'   0A  DUMMY WORD
  34F4 1E04                    5021        DC    XL2'1E04'   0B  SSN,E  SET INSIDE WRAP ON
  34F6 1C04                    5022        DC    XL2'1C04'   0C  SSN,C  SET INTR, REQ, ON
  34F8 1F04                    5023        DC    XL2'1F04'   0D  SSN,F  SET DIAGNOSTIC MODE ON
  34FA 1008                    5024        DC    XL2'1008'   0E  SSF,0  RESET BITS 2,3,13 IN I/O REG
  34FC 7443                    5025        DC    XL2'7443'   0F  IC,  SET HDB 04 = 43
  34FE 1204                    5026        DC    XL2'1204'   10  SSN,2  SET BIT 2 OF I/O REG
  3500 1304                    5027        DC    XL2'1304'   11  SSN,3  SET BIT 3 OF I/O REG ON
  3502 1004                    5028        DC    XL2'1004'   12  SSN,0  SET TRANSMIT ZEROES
  3504 0784                    5029        DC    XL2'0784'   13  LE,  LOAD I/O REG TO XMIT ZEROES
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  3506 5015              3507 5030        DC    XL2'5015'   14  BOS,0 DELAY 1 CYCLE
  3508 0784              3509 5031        DC    XL2'0784'   15  LE,  LOAD I/O REG TO XMIT WORD
  350A 4118              350B 5032        DC    XL2'4118'   16  TSN,1  WAIT FOR REC, WD RDY TO COME ON
  350C 5016              350D 5033        DC    XL2'5016'   17  BOS,0 LOOP BACK TO PREV, WD
  350E 0784              350F 5034        DC    XL2'0784'   18  LE,  LOAD I/O REG TO XMIT AGAIN
  3510 501A              3511 5035        DC    XL2'501A'   19  BOS,0 DELAY 1 CYCLE
  3512 0784              3513 5036        DC    XL2'0784'   1A  LE,  FORM XMIT WD RDY ON
  3514 5018              3515 5037        DC    XL2'5018'   1B  BOS,0  HANG, END OF PHASE 1
                              5038 *
                              5039 *      END OF PHASE 1, NEXT TIME MICROPROGRAM IS ENABLED IT WILL
                              5040 *      BRANCH TO THE FOLLOWING WORD -
                              5041 *
  3516 40E1              3517 5042        DC    XL2'40E1'   1C  TSN,0 XMIT WD RDY MUST NOT BE ON
  3518 41E2              3519 5043        DC    XL2'41E2'   1D  TSN,1 REC WD RDY MUST NOT BE ON
  351A 4EE3              351B 5044        DC    XL2'4EE3'   1E  TSN,E DATA LOOP MUST NOT BE ON
  351C 4BE4              351D 5045        DC    XL2'4BE4'   1F  TSN,B REC, CHK MUST NOT BE ON
  351E 4DE5              351F 5046        DC    XL2'4DE5'   20  TSN,D INT, REQ, MUST NOT BE ON
  3520 1008              3521 5047        DC    XL2'1008'   21  SSF,0  RESET BITS 2,3,13 OF I/O REG
  3522 1204              3523 5048        DC    XL2'1204'   22  SSN,2  SET BIT 2 OF I/O REG
  3524 1304              3525 5049        DC    XL2'1304'   23  SSN,3  SET BIT 3 OF I/O REG
  3526 1E04              3527 5050        DC    XL2'1E04'   24  SSN,E  SET INSIDE WRAP ON
  3528 0784              3529 5051        DC    XL2'0784'   25  LE, LOAD I/O REG & XMIT WD
  352A 7680              352B 5052        DC    XL2'7680'   26  IC, SET HDB 6 = 80 FOR DELAY
  352C 1640              352D 5053        DC    XL2'1640'   27  SL, SHIFT HDB 6 LEFT
  352E F610              352F 5054        DC    XL2'F610'   28  TBN, TEST HDB 6 FOR END OF DELAY
  3530 9027              3531 5055        DC    XL2'9027'   29  LOOP BACK TIL 16 CYCLE DELAY OVER
  3532 41E6              3533 5056        DC    XL2'41E6'   2A  TSN,1  REC, WD RDY MUST NOT BE ON
  3534 1704              3535 5057        DC    XL2'1704'   2B  SSN,7  RESET CURAR TC ZERO
  3536 7001              3537 5058        DC    XL2'7001'   2C  IC, SET MBAR HI = 01
  3538 7122              3539 5059        DC    XL2'7122'   2D  IC, SET MBAR LO = 22
  353A 1F04              353B 5060        DC    XL2'1F04'   2E  SSN,F TURN DIAG, MODE BACK ON
  353C 0784              353D 5061        DC    XL2'0784'   2F  LE,  LOAD I/O REG & XMIT
  353E 4132              353F 5062        DC    XL2'4132'   30  TSN, 1 WAIT FOR REC, WD RDY ON
  3540 5030              3541 5063        DC    XL2'5030'   31  BOS,0 LOOP BACK TO PREV, WD
  3542 7000              3543 5064        DC    XL2'7000'   32  IC,  SET MBAR HI = 0
  3544 7100              3545 5065        DC    XL2'7100'   33  IC,  SET MBAR LO = 0
  3546 5436              3547 5066        DC    XL2'5436'   34  BOS,1  MUST BRANCH
  3548 5035              3549 5067        DC    XL2'5035'   35  BOS,0  ERROR, HANG
  354A 5036              354B 5068        DC    XL2'5036'   36  HANG, END OF TEST
  354C 2210              354D 5069        DC    XL2'2210'   37 LR,MOVE HDB 10 TO 02
  354E 7900              354F 5070        DC    XL2'7900'   38 IC,SET HDB 09 TO 00
  3550 0889              3551 5071        DC    XL2'0889'   39  DESELECT DR/REC
  3552 0C89              3553 5072        DC    XL2'0C89'   3A  DESELECT DR/REC
  3554 0D89              3555 5073        DC    XL2'0D89'   3B  DESELECT DR/REC
  3556 0E89              3557 5074        DC    XL2'0E89'   3C  DESELECT DR/REC
  3558 5001              3559 5075 R29MCE DC    XL2'5001'   3D BOS,0 RETURN TO ADD,01
                              5076
                              5076
                              5077 ************************************************************************
                              5078 * ROUTINES 33,34,35  SPARE.                                           *
                              5079 ************************************************************************
  355A 33                355A 5080 RT33   DC    XL1'33'
  355B 00                355B 5081        DC    XL1'00'
  355C 3568              355D 5082        DC    AL2(RT34)
  355E 0C 01 3596 35FF         5083        MVC   SPARUT(2),DEC33
  3564 C0 87 3584              5084        B     SPAREX
                               5085 *
  3568 34                3568 5086 RT34   DC    XL1'34'
  3569 00                3569 5087        DC    XL1'00'
  356A 3576              356B 5088        DC    AL2(RT35)
  356C 0C 01 3596 35A1         5089        MVC   SPARUT(2),DEC34
  3572 C0 87 3584              5090        B     SPAREX
                               5091 *
  3576 35                3576 5092 RT35   DC    XL1'35'
  3577 00                3577 5093        DC    XL1'00'
  3578 35A4              3579 5094        DC    AL2(RT36)
  357A 0C 01 3596 35A3         5095        MVC   SPARUT(2),DEC35
  3580 C0 87 3584              5096        B     SPAREX
```

8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         5097 *
   3584 C0 87 021A       5098 SPAREX B     PRINT
   3588 01               3588 5099        DC    XL1'01'
   3589 0E               3589 5100        DC    IL1'14'
   358A 359D             3588 5101        DC    AL2(SPARMS)
   358C C0 87 0216       5102             B     LINK
                         5103 *
   3590 D9D6E4E340E7E740 359D 5104 SPARMS DC    CL14'ROUT XX SPARE.'
   3598 E2C7C1D9C54B     5104
                         3596 5105 SPARUT EQU   SPARMS-7
   359E F3F3             359F 5106 DEC33  DC    CL2'33'
   35A0 F3F4             35A1 5107 DEC34  DC    CL2'34'
   35A2 F3F5             35A3 5108 DEC35  DC    CL2'35'
                         5109
                         5110 ********************************************************************
                         5111 * ROUTINE 36 SIO IMMEDIATE TO ENABLE/DISABLE BSCA                 *
                         5112 ********************************************************************
                         5113 *    MICRO INSURES BSCA NOT ENABLED.                               *
                         5114 *    MACRO ENABLES BSCA.                                           *
                         5115 *    MICRO INSURES BSCA NOW ENABLED.                               *
                         5116 *    MACRO DISABLES BSCA.                                          *
                         5117 *    MICRO INSURES BSCA DISABLED.                                  *
                         5118 ********************************************************************
   35A4 36               35A4 5119 RT36   DC    XL1'36'                  ROUTINE NUMBER
   35A5 00               35A5 5120        DC    XL1'00'                  NO MANUAL INTERVENTION
   35A6 3612             35A7 5121        DC    AL2(RT37)                ADDR OF NEXT ROUTINE
                         5122 *
   35A8 C0 87 021A       5123             B     PRINT                    PRINT ROUTINE TITLE
   35AC 01               35AC 5124        DC    XL1'01'
   35AD 22               35AD 5125        DC    IL1'34'
   35AE 35D5             35AF 5126        DC    AL2(R35HDR)
   35B0 C0 87 35D6       5127             B     RT35GO
   35B4 D9D6E4E340F3F4404 35D5 5128 R35HDR DC    CL34'ROUT 36 BSCA SIO IMMED; ENAB/DISAB'
   35BC C2E2C3C140E2C5D6 5128
   35C4 40C9D4D4C5C54540 5128
   35CC C5D5C1C261C4C5E2 5128
   35D4 C1C2             5128
   35D6 C0 87 5918       5129 RT35GO B     LOADCS                   LOAD MICROPROGRAM
   35DA 83               35DA 5130        DC    XL1'83'
   35DB 3604             35DC 5131        DC    AL2(R35MCS)
   35DD 3611             35DE 5132        DC    AL2(R35MCE)
   35DF C0 87 54FE       5133             B     DOMICR                   DO MICROPROGRAM
   35E3 35               35E3 5134        DC    XL1'35'                  ERR. HALT
   35E4 5001             35E5 5135        DC    XL2'5001'                EXPECTED RESULTS
   35E6 F3 58 E0         5136             SIO   X'E0',SIOI               SIO ENABLE MC
   35E9 F3 88 C0         5137             SIO   X'C0',X'88'              SIO ENABLE BSCA
   35EC C0 87 54FE       5138             B     DOMICR                   DO MICROPROGRAM 2ND TIME
   35F0 36               35F0 5139        DC    XL1'36'                  ERROR HALT
   35F1 5004             35F2 5140        DC    XL2'5004'                EXPECTED RESULTS
   35F3 F3 58 E0         5141             SIO   X'E0',SIOI               ENABLE MC
   35F6 F3 88 80         5142             SIO   X'80',X'88'              SIO DISABLE BSCA
   35F9 C0 87 54FE       5143             B     DOMICR                   DO MICROPROGRAM 3RD TIME
   35FD 37               35FD 5144        DC    XL1'37'                  ERR. HALT
   35FE 5006             35FF 5145        DC    XL2'5006'                EXPECTED RESULTS
   3600 C0 87 0216       5146             B     LINK                     GO TO NEXT ROUTINE.
                         5147 *
                         5148 *-------------------------------*
                         5149 * START OF MICROPROGRAM LISTING *
                         5150 *-------------------------------*
                         3604 5151 R35MCS EQU   *
   3604 4700             3605 5152        DC    XL2'4700'   000   TSN.7   BR TO SELF IF BSCA ENAB.
   3606 5001             3607 5153        DC    XL2'5001'   001   BOS.0   EXPECTED RESULTS
   3608 4704             3609 5154        DC    XL2'4704'   002   TSN.7   BR TO ADDR 004 IF BSCA ENAB.
   360A 5002             360B 5155        DC    XL2'5002'   003   BOS.0   LOOP BACK TO ADDR 002 WAITING
                         5156 *                                          FOR BSCA TO BE ENABLED.
   360C 5004             360D 5157        DC    XL2'5004'   004   BOS.0   SECOND EXPECTED RESULTS
   360E 4705             360F 5158        DC    XL2'4705'   005   TSN.7   BR TO SELF WAITING FOR
                         5159 *                                          BSCA TO BE DISABLED.
```


8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   3610 5006             3611 5160 R35MCE DC    XL2'5006'   006   BOS.0   THIRD EXPECTED RESULTS
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         5162 ************************************************************************
                         5163 * ROUTINE 37 SIO IMMED.  ENAB BSCA W/2-SEC TIMEOUT REQUEST.           *
                         5164 ************************************************************************
                         5165 * 1.MICRO INSURES BSCA NOT ENABLED AND NO 2-SEC T.O. REQUEST          *
                         5166 *   MACRO ENABLES BSCA                                                 *
                         5167 * 2.MICRO INSURES BSCA IS ENAB. BUT NO 2-SEC T.O. REQUEST             *
                         5168 *   MACRO TURNS ON 2-SEC T.O. REQUEST                                  *
                         5169 * 3.MICRO INSURES 2-SEC T.O. REQUEST IS ON                            *
                         5170 *   MACRO RESETS 2-SEC T.O. WITH TIMEOUT CANCEL COMMAND                *
                         5171 * 4.MICRO INSURES BSCA IS STILL ENABLED BUT NO 2-SEC T.O. REQUEST      *
                         5172 *   MACRO SETS 2-SEC T.O. REQUEST AGAIN                                *
                         5173 * 5.MICRO INSURES 2-SEC T.O. REQUEST IS ON.                           *
                         5174 *   MACRO DISABLES BSCA                                                *
                         5175 * 6.MICRO INSURES BSCA DISABLED AND 2-SEC T.O. REQUEST RESET          *
                         5176 ************************************************************************
3612 37                  3612 5177 RT37    DC    XL1'37'                    ROUTINE NUMBER
3613 00                  3613 5178         DC    XL1'00'                    NO MANUAL INTERVENTION
3614 36DF                3615 5179         DC    AL2(RT38)                  ADDRESS OF NEXT ROUTINE
                              5180 *
3616 C0 87 021A                5181         B     PRINT                      PRINT ROUTINE TITLE
361A 01                  361A 5182         DC    XL1'01'
361B 2D                  361B 5183         DC    IL1'45'
361C 364E                361D 5184         DC    AL2(R36HDR)
361E C0 87 364F                5185         B     RT36GO
3622 D9D6E4E340F3F740    364E 5186 R36HDR  DC    CL45'ROUT 37 BSCA SIO IMMED: ENAB/DISAB W/T.O. REQ'
362A C2E2C3C140E2C5D6          5186
3632 40C9D4D4C5C45E40          5186
363A C5D5C1C261C4C5E2          5186
3642 C1C240E661E34ED6          5186
364A 4B40D9C5D8                5186
364F C0 87 5918                5187 RT36GO B     LOADCS                     LOAD MICROPROGRAM
3653 83                  3653 5188         DC    XL1'83'
3654 36A7                3655 5189         DC    AL2(R36NCS)
3656 36DE                3657 5190         DC    AL2(R36NCE)
3658 C0 87 54FE                5191         B     DOMICR                     DO 1ST MICROPROGRAM
365C 36                  365C 5192         DC    XL1'36'                     ERR. HALT
365D 5002                365E 5193         DC    XL2'5002'                   1ST EXPECTED RESULTS
365F F3 58 E0                  5194         SIO   X'E0',SIOI                ENABLE MC
3662 F3 88 C0                  5195         SIO   X'C0',X'88'                ENABLE BSCA
3665 F3 58 04                  5196         SIO   X'04',SIOI
3668 C0 87 54FE                5197         B     DOMICR                     DO 2ND MICROPROGRAM
366C 37                  366C 5198         DC    XL1'37'                     ERR. HALT
366D 5008                366E 5199         DC    XL2'5008'                   2ND EXPECTED RESULTS
366F F3 58 E0                  5200         SIO   X'E0',SIOI                ENABLE MC
3672 F3 88 04                  5201         SIO   X'04',X'88'                BSCA 2-SEC T.O. REQUEST
3675 C0 87 54FE                5202         B     DOMICR                     DO 3RD MICROPROGRAM
3679 38                  3679 5203         DC    XL1'38'                     ERR. HALT
367A 5008                367B 5204         DC    XL2'5008'                   3RD EXPECTED RESULTS
367C F3 58 E0                  5205         SIO   X'E0',SIOI                ENABLE MC
367F F3 88 00                  5206         SIO   X'00',X'88'                BSCA 2-SEC T.O. CANCEL
3682 C0 87 54FE                5207         B     DOMICR                     DO 4TH MICROPROGRAM
3686 39                  3686 5208         DC    XL1'39'                     ERROR HALT
3687 5010                3688 5209         DC    XL2'5010'                   4TH EXPECTED RESULTS
3689 F3 58 E0                  5210         SIO   X'E0',SICI                ENABLE MC
368C F3 88 04                  5211         SIO   X'04',X'88'                BSCA 2-SEC T.O. REQ.
368F C0 87 54FE                5212         B     DOMICR                     DO 5TH MICROPROGRAM
3693 3A                  3693 5213         DC    XL1'3A'                     ERR. HALT
3694 5013                3695 5214         DC    XL2'5013'                   5TH EXPECTED RESULTS
3696 F3 58 E0                  5215         SIO   X'E0',SIOI                ENABLE MC
3699 F3 88 80                  5216         SIO   X'80',X'88'                DISABLE BSCA
369C C0 87 54FE                5217         B     DOMICR                     DO 6TH MICROPROGRAM
36A0 3B                  36A0 5218         DC    XL1'3B'                     ERR. HALT
36A1 5016                36A2 5219         DC    XL2'5016'                   6TH EXPECTED RESULTS
36A3 C0 87 0216                5220         B     LINK                       GO TO NEXT ROUTINE
                               5221 *
                               5222 *-----------------------------*
                               5223 * START OF MICROPROGRAM LISTING *
                               5224 *-----------------------------*
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         36A7 5225 R36NCS EQU   *
36A7 4700                36A8 5226         DC    XL2'4700'    000   TSN.7 BR TO SELF IF BSCA ENAB.
36A9 4601                36AA 5227         DC    XL2'4601'    001   TSN.6 BR TO SELF IF 2-SEC T.O. REQ ON.
36AB 5002                36AC 5228         DC    XL2'5002'    002   BOS.0 1ST EXPECTED RESULTS
36AD 4705                36AE 5229         DC    XL2'4705'    003   TSN.7 BR TO 005 WHEN BSCA ENAB.
36AF 5003                36B0 5230         DC    XL2'5003'    004   BOS.0 TO ADDR 003. WAIT FOR BSCA ENAB.
36B1 5007                36B2 5231         DC    XL2'5007'    005   BOS.0 TO ADDR 007.
36B3 5006                36B4 5232         DC    XL2'5006'    006   BOS.0 ERROR. HANG
36B5 4606                36B6 5233         DC    XL2'4606'    007   TSN.6 BR TO ADDR 006 IF 2-SEC T.O. REQ.
36B7 5008                36B8 5234         DC    XL2'5008'    008   BOS.0 2ND EXPECTED RESULTS
36B9 4619                36BA 5235         DC    XL2'4619'    009   TSN.6 BR TO ADDR 019 IF 2-SEC T.O. REQ.
36BB 5009                36BC 5236         DC    XL2'5009'    00A   BOS.0 TO ADDR 009. WAIT FOR T.O. REQ.
36BD 500B                36BE 5237         DC    XL2'500B'    00B   BOS.0 3RD EXPECTED RESULTS
36BF 4717                36C0 5238         DC    XL2'4717'    00C   TSN.7 BR TO 017 IF BSCA STILL ENAB.
36C1 500C                36C2 5239         DC    XL2'500C'    00D   BOS.0 TO ADDR 00C WAIT FOR BSCA ENAB.
36C3 500E                36C4 5240         DC    XL2'500E'    00E   BOS.0 ERROR. HANG
36C5 460E                36C6 5241         DC    XL2'460E'    00F   TSN.6 BR TO ADDR 00E IF 2-SEC T.O. REQ.
36C7 5010                36C8 5242         DC    XL2'5010'    010   BOS.0 4TH EXPECTED RESULTS
36C9 4613                36CA 5243         DC    XL2'4613'    011   TSN.6 BR TO ADDR 013 IF 2-SEC T.O. REQ.
36CB 5011                36CC 5244         DC    XL2'5011'    012   BOS.0 TO ADDR 011. WAIT FOR T.O. REQ.
36CD 5013                36CE 5245         DC    XL2'5013'    013   BOS.0 5TH EXPECTED RESULTS
36CF 4614                36D0 5246         DC    XL2'4614'    014   TSN.6 BR TO SELF IF BSCA STILL ENAB.
36D1 4715                36D2 5247         DC    XL2'4715'    015   TSN.7 BR TO SELF IF T.O. REQ STILL ON.
36D3 5016                36D4 5248         DC    XL2'5016'    016   BOS.0 6TH EXPECTED RESULTS
36D5 5018                36D6 5249         DC    XL2'5018'    017   BOS.0 TO ADDR 018  DUMMY CYCLE
36D7 500F                36D8 5250         DC    XL2'500F'    018   BOS.0 TO ADDR 00F DUMMY CYCLE
36D9 1908                36DA 5251         DC    XL2'1908'    019   SSF.9 SHOULD NOT RST T.O. REQ
36DB 460B                36DC 5252         DC    XL2'460B'    01A   TSN.6 BR TO ADDR 00B IF STILL T.O.REQ.
36DD 501B                36DE 5253 R36NCE  DC    XL2'501B'    01A   BOS.0 ERROR HANG
```

```
ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

                                5255 ************************************************************************
                                5256 * ROUTINE 38 BSCA SIO NON-IMMEDIATE                                    *
                                5257 ************************************************************************
                                5258 *                                                                      *
                                5259 * 1. MICRO.  INSURE NC'SIO SVC REQ ESCA BUSY'.                          *
                                5260 *            ZERO OUT HDB 16.17.26.27.                                 *
                                5261 *                                                                      *
                                5262 * 1A MACRO   INSURE TIO BSCA NOT BUSY..                                *
                                5263 *            ENABLE BSCA WITH A NON-IMMEDIATE SIO                      *
                                5264 *            INSURE BSCA BUSY                                          *
                                5265 *                                                                      *
                                5266 * 2. MICRO   INSURE BSCA ENABLED.                                      *
                                5267 *            INSURE 'SIO SVC REQ BUSY' IS ON.                          *
                                5268 *            INSURE HDB 26.27 EQUAL IR. IQ.                            *
                                5269 *            INSURE HDB 16.17 NOT CHANGED.                             *
                                5270 *                                                                      *
                                5271 * 3. MICRC   RESET BSCA BUSY                                           *
                                5272 *            INSURE BSCA BUSY IS RESET.                                *
                                5273 *                                                                      *
                                5274 * 3A MACRO   INSURE TIO BSCA NOT BUSY                                  *
                                5275 *            ENABLE BSCA AGAIN WITH ANOTHER NON-IMMEDIATE SIO.         *
                                5276 *            INSURE TIO BSCA BUSY                                      *
                                5277 *            DISABLE BSCA                                              *
                                5278 *            INSURE BSCA NOT BUSY                                      *
                                5279 *            LIO HDB 16.17 EQUAL 0000                                  *
                                5280 *            LIO HDB 26.27 EQUAL 0000                                  *
                                5281 *            ISSUE BSCA SIO CONTROL ONLY                               *
                                5282 *            INSURE BSCA NOT BUSY                                      *
                                5283 *            INSURE HDB 16,17 AND 26.27 STILL 0000                     *
                                5284 *            ISSUE BSCA SIO NON-IMMEDIATE                              *
                                5285 *            ISSUE 32XX SIO NON-IMMEDIATE                              *
                                5286 *            SNS BACK IQ.IR FROM BOTH COMMANDS AND CHECK               *
                                5287 *                                                                      *
                                5288 ************************************************************************
    36DF 38                36DF 5289 RT38     DC    XL1'38'                      ROUTINE NO.
    36E0 00                36E0 5290          DC    XL1'00'                      NO MANUAL INTERVENTION
    36E1 3843              36E2 5291          DC    AL2(RT39)                    ADDR OF NEXT ROUTINE
                                5292
    36E3 C0 87 021A             5293          B     PRINT
    36E7 01                36E7 5294          DC    XL1'01'
    36E8 28                36E8 5295          DC    IL1'43'
    36E9 3719              36EA 5296          DC    AL2(R37HDR)
    36EB C0 87 371A             5297          B     RT37GO
    36EF D9D6E4E340F3F840  3719 5298 R37HDR   DC    CL43'ROUT 38 BSCA SIO NON-IMMEDIATE AND TIO BUSY'
    36F7 C2E2C3C140E2C9D6       5298
    36FF 40D5D6D560C9D4D4       5298
    3707 C5C4C9C1E3C540C1       5298
    370F D5C440E3C9D640C2       5298
    3717 E4E2E8                 5298
    371A C0 87 5918             5299 RT37GO   B     LOADCS                       GO LOAD MICROCODE
    371E 83                371E 5300          DC    XL1'83'
    371F 3801              3720 5301          DC    AL2(R37MCS)
    3721 3842              3722 5302          DC    AL2(R37MCE)
    3723 C0 87 54FE             5303          B     DOMICR                       DO MICROCODE
    3727 37                3727 5304          DC    XL1'37'                       ERROR HALT  -37-
    3728 5006              3729 5305          DC    XL2'5006'                     FIRST EXPECTED RESULTS
    372A F3 58 E0               5306          SIO   X'E0'.SIOI                   ENABLE MC
    372D C1 8A 3743             5307          TIO   BSYERR.X'8A'                 TIC BSCA BUSY. SHOULDN'T BE.
    3731 F3 88 C0               5308          SIO   X'C0'.X'88'                  ENABLE BSCA
    3734 F3 8A C4               5309          SIO   X'C4'.X'8A'                  SIO NON-IMMED
    3737 C1 8A 374B             5310          TIO   R37MC2.X'8A'                 TIO BSCA BUSY. SHOULD BE.
    373B C0 87 5B72             5311          B     PRINTM                       ERROR HALT 40
    373F 40                373F 5312          DC    XL1'40'
    3740 16                3740 5313          DC    IL1'22'
    3741 60F7              3742 5314          DC    AL2(STATMB)
                                5315
    3743 C0 87 5B72             5316 BSYERR   B     PRINTM                       ERROR HALT 41
    3747 41                3747 5317          DC    XL1'41'
```



```
ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

    3748 0F                3748 5318          DC    IL1'15'
    3749 60C2              374A 5319          DC    AL2(STATM9)
                                5320
    374B C0 87 54FE             5321 R37MC2   B     DOMICR                       DO 2ND MICROPROGRAM
    374F 38                374F 5322          DC    XL1'38'                      ERROR HALT -38-
    3750 501B              3751 5323          DC    XL2'501B'                    EXPECTED RESULTS
    3752 C0 87 54FE             5324          B     DOMICR                       DO 3RD MICROPROGRAM
    3756 39                3756 5325          DC    XL1'39'                       ERR HALT
    3757 5020              3758 5326          DC    XL2'5020'                     EXPECTED RESULTS
    3759 F3 58 E0               5327          SIO   X'E0'.SIOI                   ENABLE MC
    375C C1 8A 3772             5328          TIO   BSYER2.X'8A'                 TIO BSCA BUSY. SHOULDN'T BE
    3760 F3 88 C0               5329          SIO   X'C0'.X'88'                  ENABLE BSCA
    3763 F3 8A C4               5330          SIO   X'C4'.X'8A'                  SIO NON-IMMED
    3766 C1 8A 377C             5331          TIO   R37NS1.X'8A'                 TIO BSCA BUSY. SHOULD BE
    376A C0 87 5B72             5332          B     PRINTM                       ERROR HALT 42
    376E 42                376E 5333          DC    XL1'42'
    376F 16                376F 5334          DC    IL1'22'
    3770 60F7              3771 5335          DC    AL2(STATMB)
    3772 C0 87 5B72             5336 BSYER2   B     PRINTM                       ERROR HALT 49
    3776 49                3776 5337          DC    XL1'49'
    3777 0F                3777 5338          DC    IL1'15'
    3778 60C2              3779 5339          DC    AL2(STATM9)
    377A 0000              377B 5340 SNSIT    DC    XL2'00'                      SENSE HDB'S HERE.
    377C F3 88 80               5341 R37NS1   SIO   X'80'.X'88'                  DISABLE BSCA
    377F C1 8A 37D9             5342          TIO   DISERR.X'8A'                 TIO BSCA BUSY. SHOULDN'T BE
    3783 31 48 0D62             5343          LIO   ZERO.HDB3                    HDB 16.17 SET TO ZERO
    3787 F3 58 80               5344          SIO   X'80'.SICI                   DISABLE MC
    378A 31 88 0D62             5345          LIO   ZERO.X'88'                   HDB 26.27 SET TO ZERO
    378E F3 58 E0               5346          SIO   X'E0'.SIOI                   ENABLE MC
    3791 F3 88 04               5347          SIO   X'04'.X'88'                  SIO BSCA CTL ONLY NO-OP.
    3794 C1 8A 37F9             5348          TIO   R37H48.X'8A'                 TIO BSCA BUSY. SHLD NOT BE
    3798 30 48 377B             5349          SNS   SNSIT.HDB3                   SNS HDB'S 16.17
    379C 0D 01 377B 0D62        5350          CLC   SNSIT(2).ZERO
    37A2 C0 01 37E1             5351          BNE   HDBER1
    37A6 F3 58 80               5352          SIO   X'80'.SICI                   DISABLE MC
    37A9 30 88 377B             5353          SNS   SNSIT.X'88'                  SNS HDB'S 26;27
    37AD F3 58 E0               5354          SIO   X'E0'.SICI                   ENABLE MC
    37B0 0D 01 377B 0D62        5355          CLC   SNSIT(2).ZERO
    37B6 C0 01 37E9             5356          BNE   HDBER2
    37BA F3 88 C0               5357          SIO   X'C0'.X'88'                  ENABLE BSCA
    37BD F3 8A C0               5358          SIO   X'C0'.X'8A'                  SIO NON-IMMED
    37C0 F3 58 80               5359          SIO   X'80'.SICI                   DISABLE MC
    37C3 30 88 377B             5360          SNS   SNSIT.X'88'                  SNS HDB'S 26.27
    37C7 F3 58 E0               5361          SIO   X'E0'.SIOI                   ENABLE MC
    37CA 3D 8A 377B             5362          CLI   SNSIT.X'8A'                  DID IQ OF '8A' GET TO HDB 27?
    37CE C0 01 37F1             5363          BNE   R37E47                       BR IF NOT
    37D2 F3 58 80               5364          SIO   X'80'.SIOI                   DISABLE RESET
    37D5 C0 87 0216             5365          B     LINK                         BR TO NEXT ROUTINE
                                5366
    37D9 C0 87 5B72             5367 DISERR   B     PRINTM                       ERROR HALT 43
    37DD 43                37DD 5368          DC    XL1'43'
    37DE 0F                37DE 5369          DC    IL1'15'
    37DF 60C2              37E0 5370          DC    AL2(STATM9)
                                5371
    37E1 C0 87 5B72             5372 HDBER1   B     PRINTM                       ERROR HALT 44
    37E5 44                37E5 5373          DC    XL1'44'
    37E6 16                37E6 5374          DC    IL1'22'
    37E7 6176              37E8 5375          DC    AL2(STATB3)
                                5376
    37E9 C0 87 5B72             5377 HDBER2   B     PRINTM                       ERROR HALT 45
    37ED 45                37ED 5378          DC    XL1'45'
    37EE 16                37EE 5379          DC    IL1'22'
    37EF 6176              37F0 5380          DC    AL2(STATB3)
                                5381
    37F1 C0 87 5B72             5382 R37E47   B     PRINTM                       ERROR HALT 47
    37F5 47                37F5 5383          DC    XL1'47'
    37F6 16                37F6 5384          DC    IL1'22'
    37F7 6176              37F8 5385          DC    AL2(STATB3)
```

8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   37F9 C0 87 5872          5386 R37H48 B     PRINTM                    ERR HALT 48
   37FD 48                  37FD 5387       DC    XL1'48'
   37FE 0F                  37FE 5388       DC    IL1'15'
   37FF 60C2                3800 5389       DC    AL2(STATM9)
                                 5390
                                 5391 *-------------------------------*
                                 5392 * START OF MICROPROGRAM LISTING *
                                 5393 *-------------------------------*
                            3801 5394 R37MCS EQU   *
   3801 7000                3802 5395       DC    XL2'7000'   000   IC HDB 00=00
   3803 2620                3804 5396       DC    XL2'2620'   001   LR HDB 00 TO HDB 16
   3805 2720                3806 5397       DC    XL2'2720'   002   LR HDB 00 TO HDB 17
   3807 2680                3808 5398       DC    XL2'2680'   003   LR HDB 00 TO HDB 26
   3809 2780                380A 5399       DC    XL2'2780'   004   LR HDB 00 TO HDB 27
   380B 5805                380C 5400       DC    XL2'5805'   005   BOS,2 BR ON BSCA SIO SVC REQ. ERR. HANG
   380D 5006                380E 5401       DC    XL2'5006'   006   BOS.0 1ST EXPECTED RESULTS.
   380F 5808                3810 5402       DC    XL2'5808'   007   BOS,2 BR ON BSCA SIO SVC REQ TO ADD 08
   3811 5007                3812 5403       DC    XL2'5007'   008   BOS.0 WAIT LOOP
   3813 500A                3814 5404       DC    XL2'500A'   009   BOS,0 DUMMY
   3815 500A                3816 5405       DC    XL2'500A'   00A   BOS.0 ERROR. HANG
   3817 8016                3818 5406       DC    XL2'8016'   00B   CIR.00.16
   3819 9C0E                381A 5407       DC    XL2'9C0E'   00C   BOC.3  BR IF EQUAL TO ADDRESS 00E.
   381B 500D                381C 5408       DC    XL2'500D'   00D   BOS.0 ERROR. HANG
   381D 8720                381E 5409       DC    XL2'8720'   00E   CIR 17.00
   381F 9C11                3820 5410       DC    XL2'9C11'   00F   BOC.3  BR IF EQUAL TO ADDRESS 011
   3821 5010                3822 5411       DC    XL2'5010'   010   BOS.0 ERROR. HANG
   3823 2446                3824 5412       DC    XL2'2446'   011   LR HDB 26 TO HDB 04. (IR BYTE)
   3825 2547                3826 5413       DC    XL2'2547'   012   LR HDB 27 TO HDB 05. (IQ BYTE)
   3827 76C4                3828 5414       DC    XL2'76C4'   013   IC HDB 06 EQUAL C4
   3829 778A                382A 5415       DC    XL2'778A'   014   IC HDB 07 EQUAL 8A
   382B 8406                382C 5416       DC    XL2'8406'   015   CIR 04.06  TEST IF IR EQUAL C4
   382D 9C18                382E 5417       DC    XL2'9C18'   016   BOC.3  BR IF EQUAL TO ADDRESS 018
   382F 5017                3830 5418       DC    XL2'5017'   017   BOS.0  ERROR. HANG
   3831 8507                3832 5419       DC    XL2'8507'   018   CIR 05.07  TEST IF IQ EQUALS 89
   3833 9C1B                3834 5420       DC    XL2'9C1B'   019   BOC.3   BR IF EQUAL TO ADDRESS 01B
   3835 501A                3836 5421       DC    XL2'501A'   01A   BOS.0   ERROR. HANG
   3837 501B                3838 5422       DC    XL2'501B'   01B   BOS.0   2ND EXPECTED RESULTS
   3839 581E                383A 5423       DC    XL2'581E'   01C   BOS.2   BR ON BSCA SIO SVC REQ TO 01E
   383B 501D                383C 5424       DC    XL2'501D'   01D   BOS.0   ERROR. HANG
   383D 1308                383E 5425       DC    XL2'1308'   01E   SSF.3   RESET BSCA SIO SVC REQ
   383F 581F                3840 5426       DC    XL2'581F'   01F   BOS.2   ERROR. HANG
   3841 5020                3842 5427 R37MCE DC    XL2'5020'   020   BOS.0   3RD EXPECTED RESULTS
                                 5428
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                 5430 ********************************************************************************
                                 5431 * ROUTINE 39 BSCA INTERRUPT TEST                                              *
                                 5432 ********************************************************************************
                                 5433 *                                                                              *
                                 5434 * MACRO-1   DISABLES BSCA INTERRUPTS                                          *
                                 5435 *                                                                              *
                                 5436 * MICRO-1   PRESENTS INT REQ. (NO INT SHOULD OCCUR YET.)                      *
                                 5437 *                                                                              *
                                 5438 * MACRO-2   INSURES TIO INT THAT AN INT IS PENDING.                           *
                                 5439 *                                                                              *
                                 5440 *           INSURES TIO OP-END INT IS PENDING.                                 *
                                 5441 *             (THIS SHOULD RESET THE OP-END INT PENDING)                       *
                                 5442 *           INSURES TIO OP-END INT PENDING NOW NEGATIVE                         *
                                 5443 *           ENABLES INT.  (INT SHOULD OCCUR.)                                  *
                                 5444 *           RESETS INT REQ.  (INTERRUPT SHOULD TERMINATE)                      *
                                 5445 *           DISABLES INTERRUPTS                                                *
                                 5446 *                                                                              *
                                 5447 * MICRO-2   PRESENTS INT REQ. (NO INT SHOULD OCCUR)                           *
                                 5448 *                                                                              *
                                 5449 * MACRO-3   INSURES OP-END INT PENDING.                                       *
                                 5450 *           DISABLES BSCA                                                      *
                                 5451 *           INSURES NO OP-END INT PENDING.                                     *
                                 5452 *                                                                              *
                                 5453 * MACRO-4   CAUSE ATTACHMENT CK & INSURE INT. OCCURS.                         *
                                 5454 *                                                                              *
                                 5455 ********************************************************************************
   3843 39                  3843 5456 RT39    DC    XL1'39'                   ROUTINE NO.
   3844 00                  3844 5457       DC    XL1'00'                   NO MANUAL INTERVENTION
   3845 39B3                3846 5458       DC    AL2(RT3A)                 ADDRESS OF NEXT ROUTINE
                                 5459
   3847 C0 87 021A                5460       B     PRINT                     PRINT ROUTINE HDR
   3848 01                  384B 5461       DC    XL1'01'
   384C 1C                  384C 5462       DC    IL1'28'
   384D 386E                384E 5463       DC    AL2(R38HDR)
   384F C0 87 386F                5464       B     RT38GO
   3853 D9D6E4E340F3F540    386E 5465 R38HDR DC    CL28'ROUT 39 BSCA INTERRUPT TEST'
   3858 C2E2C3C140C9D5E3          5465
   3863 C5D9D9E4D7E34DE3          5465
   3868 C5E2E340                  5465
                                 5466 * START MACRO-1
   386F C0 87 5918                5467 RT38GO B     LOADCS                    GO LOAD MICROCODE
   3873 83                  3873 5468       DC    XL1'83'
   3874 39A7                3875 5469       DC    AL2(R38MCS)                START ADDRESS
   3876 39B2                3877 5470       DC    AL2(R38MCE)                END ADDRESS
   3878 F3 58 80                  5471       SIO   X'80',SIOI                 DISABLE RESET 32XX
   387B F3 58 E0                  5472       SIO   X'E0',SIOI                 ENABLE 32XX
   387E 3C 00 394C                5473       MVI   INTFLG,X'00'               RESET INTFLG
   3882 F3 88 C2                  5474       SIO   X'C2',X'88'                ENABLE BSCA
   3885 F3 88 00                  5475       SIO   X'00',X'88'
   3888 38 A0 3948                5476       L     INT38A,IAR2                LOAD INT LVL 2 IAR
   388C 3C 00 394C                5477       MVI   INTFLG,X'00'               RESET INT FLAG
                                 5478 * START MICRO-1 AND MACRO-2
   3890 F3 58 E0                  5479       SIO   X'E0',SIOI                 ENABLE MC
   3893 C1 88 393A                5480       TIO   R38E4I,X'88'               BSCA ITB INT SHLD NOT BE PENDING
   3897 C1 8C 38A3                5481       TIO   R38INT,X'8C'               BSCA INT SHOULD BE PENDING
   3898 C0 87 5872                5482       B     PRINTM                     ERROR HALT 39
   389F 39                  389F 5483       DC    XL1'39'
   38A0 1F                  38A0 5484       DC    IL1'31'
   38A1 60E1                38A2 5485       DC    AL2(STATMA)
                                 5486
   38A3 C1 89 38AF                5487 R38INT TIO   R38IOE,X'89'               BSCA OP-END INT SHLD BE PENDING
   38A7 C0 87 5872                5488       B     PRINTM                     ERROR HALT 3A
   38AB 3A                  38AB 5489       DC    XL1'3A'
   38AC 1F                  38AC 5490       DC    IL1'31'
   38AD 60E1                38AE 5491       DC    AL2(STATMA)
                                 5492
   38AF C1 89 391C                5493 R38IOE TIO   R38E42,X'89'               BSCA OP-END INT SHLD NOT BE PEND
   38B3 3C 01 394C                5494       MVI   INTFLG,X'01'               SET INT EXPECTED FLAG BIT
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   38B7 F3 88 02                5495          SIO   X'02',X'88'
   38BA C0 87 38BE              5496          B     NXT38
   38BE 3D 02 394C              5497 NXT38    CLI   INTFLG,X'02'
   38C2 C0 01 3924              5498          BNE   R38E43
   38C6 F3 58 E0                5499          SIO   X'E0',SIOI
   38C9 F3 88 C0                5500          SIO   X'C0',X'88'
                                5501 * START MICRO-2
   38CC C0 87 54FE              5502          B     COMICR
   38D0 45                38D0  5503          DC    XL1'45'
   38D1 5003              38D2  5504          DC    XL2'5003'
                                5505 * START MACRO-3
   38D3 F3 58 E0                5506          SIO   X'E0',SIOI
   38D6 C1 8C 38E2              5507          TIO   HAVINT,X'8C'
   38DA C0 87 5872              5508          B     PRINTM
   38DE 44                38DE  5509          DC    XL1'44'
   38DF 1F                38DF  5510          DC    IL1'31'
   38E0 60E1              38E1  5511          DC    AL2(STATMA)
                                5512
   38E2 F3 88 80                5513 HAVINT SIO   X'80',X'88'
   38E5 C1 8C 3932              5514          TIO   R38E40,X'8C'
   38E9 F3 58 80                5515          SIO   X'80',SIOI
                                5516 * START MACRO-4
   38EC C0 87 5918              5517          B     LOADCS
   38F0 01                38F0  5518          DC    XL1'01'
   38F1 F3 58 84                5519          SIO   X'84',SIOI
   38F4 31 59 5D8D              5520          LIO   X2205,OPDEC
   38F8 F3 58 80                5521          SIO   X'80',SIGI
   38FB F3 58 E0                5522          SIO   X'E0',SIOI
   38FE 3C 01 394C              5523          MVI   INTFLG,X'01'
   3902 35 A0 3948              5524          L     INT38A,IAR2
   3906 F3 88 C2                5525          SIO   X'C2',X'88'
   3909 C0 87 390D              5526          B     NXT111
   390D 3D 02 394C              5527 NXT111   CLI   INTFLG,X'02'
   3911 C0 01 3942              5528          BNE   R38E48
   3915 F3 58 80                5529          SIO   X'80',SIOI
   3918 C0 87 0216              5530          B     LINK
                                5531
   391C C0 87 5872              5532 R38E42   B     PRINTM
   3920 42                3920  5533          DC    XL1'42'
   3921 11                3921  5534          DC    IL1'17'
   3922 6087              3923  5535          DC    AL2(STATM6)
                                5536
   3924 0C 01 3990 39EE         5537 R38E43   MVC   R1CIC(2),WORDNO
   392A C0 87 5872              5538          B     PRINTM
   392E 43                392E  5539          DC    XL1'43'
   392F 18                392F  5540          DC    IL1'24'
   3930 39A6              3931  5541          DC    AL2(R1CM1)
   3932 C0 87 5872              5542 R38E40   B     PRINTM
   3936 40                3936  5543          DC    XL1'40'
   3937 11                3937  5544          DC    IL1'17'
   3938 6087              3939  5545          DC    AL2(STATM6)
                                5546
   393A C0 87 5872              5547 R38E41   B     PRINTM
   393E 41                393E  5548          DC    XL1'41'
   393F 11                393F  5549          DC    IL1'17'
   3940 6087              3941  5550          DC    AL2(STATM6)
                                5551
   3942 C0 87 5872              5552 R38E48   B     PRINTM
   3946 48                3946  5553          DC    XL1'48'
   3947 12                3947  5554          DC    IL1'18'
   3948 6190              3949  5555          DC    AL2(STAT85)
                                5556
                                5557 ************************************
                                5558 * ROUTINE 39 INTERRUPT SUBROUTINE  *
                                5559 ************************************
   394A 394D              3948  5560 INT38A   DC    AL2(INT38)
   394C 00                394C  5561 INTFLG   DC    XL1'00'
                                5562 *
```

ENABLE BSCA INTERRUPTS
DUMMY OP
DID INT OCCUR?
BR IF NOT
ENABLE MC
DISABLE BSCA INT., ENABLE BSCA

DO 2 ND MICRO
ERROR HALT -45-
2ND EXPECTED RESULTS

ENABLE MC
BSCA INT SHOULD BE PENDING
ERROR HALT 44

DISABLE BSCA W/O INT RESET
BSCA INT. SHOULD NOT BE PENDING
DISABLE RESET 32XX

GO PUT BCS-TO-ADDR
IN FIRST 256 WORDS
SET DIAG-2 LATCH
LOAD OP-DEC WITH BAD PARITY
DISABLE RESET, ENABLE MC,
ATTACH CK SHOULD OCCUR
SET INT-EXPECTED FLAG BIT
LOAD INT LVL-2 IAR
ENABLE BSCA INT
DUMMY OP
DID INT OCCUR?
BR IF NOT
DISABLE RESET
BR TO NEXT ROUTINE

ERROR HALT 42

'BSCA OP-END INT PENDING'

ERROR HALT 43

ERR HALT 40

ERR HALT 41

ERR HALT 48

ADDRESS FOR INT LVL-2 IAR
INTERRUPT FLAG
00=NO INT EXPECTED


```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                5563 *                                  01=INT EXPECTED
                                5564 *                                  02=INT OCCURRED
   394D 3D 01 394C              5565 INT38    CLI   INTFLG,X'01'        INT EXPECTED?
   3951 C0 81 3964              5566          BE    INTEX1
   3955 35 20 398A              5567          L     AEH39,P1IAR
   3959 F3 88 01                5568          SIO   X'01',X'88'         RESET INT
   395C C0 87 5872              5569 EH39     B     PRINTM              ERROR HALT 39
   3960 39                3960  5570          DC    XL1'39'
   3961 0F                3961  5571          DC    IL1'15'
   3962 613E              3963  5572          DC    AL2(STATB0)
                                5573
   3964 3C 02 394C              5574 INTEX1   MVI   INTFLG,X'02'         SET 'INT OCCURRED' IN FLAG BYTE
   3968 F3 88 01                5575          SIO   X'01',X'88'         RESET PENDING BSCA INT
   396B 3D 01 394C              5576          CLI   INTFLG,X'01'        INT EXPECTED?
   396F C0 81 3982              5577          BE    INTEX2
   3973 35 20 398C              5578          L     AEH3C,P1IAR
   3977 F3 88 01                5579          SIO   X'01',X'88'         RESET INT
   397A C0 87 5872              5580 EH3C     B     PRINTM              ERROR HALT 3C
   397E 3C                397E  5581          DC    XL1'3C'
   397F 0F                397F  5582          DC    IL1'15'
   3980 613E              3981  5583          DC    AL2(STATB0)
                                5584
   3982 F3 88 01                5585 INTEX2   SIO   X'01',X'88'         RESET PENDING BSCA INT
   3985 C0 87 394D              5586          B     INT38
   3989 395C              398A  5587 AEH39    DC    AL2(EH39)
   3988 397A              398C  5588 AEH3C    DC    AL2(EH3C)
                                5589
   398D D5F0                398E  5590 WORDNO   DC    CL2'NO'
   398F C3C3                3990  5591 R1CIC    DC    CL2'CC'
   3991 C9D5E3C5D9D9E4D7    39A6  5592 R1CM1    DC    CL22'INTERRUPTS TOOK PLACE'
   3999 E3E240E3D6D6D240
   39A1 D7C3C1C3C540
                                5592
                                5593 *-------------------------------*
                                5594 * START OF MICROPROGRAM LISTING *
                                5595 *-------------------------------*
                          39A7  5596 R38MCS   EQU   *
   39A7 4702                39A8  5597          DC    XL2'4702'           TSN.7 BSCA ENABLED
   39A9 5000                39AA  5598          DC    XL2'5000'           BOS.0
   39AB 1404                39AC  5599          DC    XL2'1404'           SET INT ON
   39AD 5003                39AE  5600          DC    XL2'5003'           HANG
   39AF 1404                39B0  5601          DC    XL2'1404'           SSN.4 SET INT AGAIN
   39B1 5005                39B2  5602 R38MCE   DC    XL2'5005'           HANG AGAIN
```

8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         5604 ************************************************************
                         5605 * ROUTINE 3A BSCA TIO NOT RDY/UNIT CK                     *
                         5606 ************************************************************
                         5607 *                                                          *
                         5608 *  MACRO  ENABLE MC                                        *
                         5609 *         DISABLE BSCA                                     *
                         5610 *         TIO SHOULD BE NOT RDY/UNIT CK                    *
                         5611 *         ENABLE BSCA                                      *
                         5612 *         TIO SHOULD NOT BE NOT RDY/UNIT CK                *
                         5613 *         DISABLE BSCA                                     *
                         5614 *         TIO SHOULD BE NOT RDY/UNIT CK                    *
                         5615 *         ENABLE BSCA                                      *
                         5616 *                                                          *
                         5617 *  MICRO  SET UNIT CHECK                                   *
                         5618 *                                                          *
                         5619 *  MACRO  TIO SHOULD BE NOT RDY/UNIT CK                    *
                         5620 *         SIO NON IMMEDIATE TO BSCA                        *
                         5621 *         TIO SHOULD NOT BE NOT RDY/UNIT CK                *
                         5622 *                                                          *
                         5623 ************************************************************
3983 3A                  3983 5624 RT3A   DC    XL1'3A'                    ROUTINE NO.
3984 00                  3984 5625        DC    XL1'00'
3985 3AA9                3986 5626        DC    AL2(RT3B)                  ADDR OF NEXT ROUTINE
                              5627
3987 C0 87 021A                5628        B     PRINT                      PRINT ROUTINE HEADER
3988 01                  3988 5629        DC    XL1'01'
398C 23                  398C 5630        DC    IL1'36'
398D 39E5                398E 5631        DC    AL2(R39HDR)
398F C0 87 39E6                5632        B     R39G0
39C3 D9D6E4E340F3C340    39E5 5633 R39HDR DC    CL35'ROUT 3A BSCA TIO NOT RDY/UNIT CHECK'
39CB C2E2C3C140E3C5D6          5633
39D3 40D5D6E340D9C4E8          5633
39DB 61E4D5C9E340C3C8          5633
39E3 C5C302                    5633
39E6 F3 58 80                  5634 R39G0  SIO   X'80',SIOI                 DISABLE RESET.  32XX
39E9 C0 87 5918                5635        B     LOADCS                     LOAD MICROCODE
39ED 83                  39ED  5636        DC    XL1'83'
39EE 3A93                39EF  5637        DC    AL2(R39MCS)                START ADDRESS
39F0 3AA8                39F1  5638        DC    AL2(R39MCE)                END ADDRESS
39F2 F3 58 E0                  5639        SIO   X'E0',SIOI                 ENABLE MC
39F5 C1 88 3A01                5640        TIO   R39S1,X'88'                BSCA NR/UC.  SHOULD BRANCH
39F9 C0 87 5B72                5641        B     PRINTM                     ERROR HALT 39
39FD 39                  39FD  5642        DC    XL1'39'
39FE 13                  39FE  5643        DC    IL1'19'
39FF 6160                3A00  5644        DC    AL2(STATB2)
3A01 F3 88 C0                  5645 R39S1  SIO   X'C0',X'88'                ENABLE BSCA
3A04 38 20 0A0E                5646        TBN   UDT3-1,X'20'               IS BSCA-1 INSTALLED
3A08 C0 90 3A10                5647        BF    R39T1                      BR IF NOT
3A0C C1 80 3A10                5648        TIO   R39T1,X'80'                TIO U.C. TO BSCA-1
3A10 C1 88 3A83                5649 R39T1  TIO   R39E3A,X'88'               BSCA NR/UC. SHOULDN'T BRANCH
3A14 F3 88 80                  5650        SIO   X'80',X'88'               DISABLE BSCA
3A17 C1 88 3A23                5651        TIO   R39S2,X'88'                BSCA NR/UC.  SHOULD BRANCH
3A1B C0 87 5B72                5652        B     PRINTM                     ERROR HALT 41
3A1F 41                  3A1F  5653        DC    XL1'41'
3A20 13                  3A20  5654        DC    IL1'19'
3A21 6160                3A22  5655        DC    AL2(STATB2)
                               5656
3A23 F3 58 E0                  5657 R39S2  SIO   X'E0',SIOI                ENABLE MC
3A26 F3 88 C0                  5658        SIO   X'C0',X'88'                ENABLE BSCA
3A29 C0 87 54FE                5659        B     DOMICR
3A2D 42                  3A2D  5660        DC    XL1'42'                    HALT -42-
3A2E 5004                3A2F  5661        DC    XL2'5004'                  1ST EXPECTED RESULT
3A30 F3 58 E0                  5662        SIO   X'E0',SIOI                 ENABLE MC
3A33 C0 87 54FE                5663        B     DOMICR
3A37 43                  3A37  5664        DC    XL1'43'                    HALT -43-
3A38 5006                3A39  5665        DC    XL2'5006'                  2ND EXPECTED RESULT
3A3A F3 58 E0                  5666        SIO   X'E0',SIOI                 ENABLE MC
3A3D F3 88 C0                  5667        SIO   X'C0',X'88'                ENABLE BSCA
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

3A40 38 20 0A0E                5668        TBN   UDT3-1,X'20'               IS BSCA-1 INSTALLED
3A44 C0 90 3A4C                5669        BF    R39S4                      BR IF NOT
3A48 C1 80 3A4C                5670        TIO   R39S4,X'80'                TIO UC TO BSCA-1
3A4C C1 88 3A58                5671 R39S4  TIO   R39S3,X'88'                BSCA NR/UC. SHLD BRANCH. UNIT CK
3A50 C0 87 5872                5672        B     PRINTM                     ERROR HALT 3C.
3A54 3C                  3A54  5673        DC    XL1'3C'
3A55 13                  3A55  5674        DC    IL1'19'
3A56 6160                3A57  5675        DC    AL2(STATB2)
                               5676
3A58 C1 88 3A68                5677 R39S3  TIO   R39S3A,X'88'               TIO NR/UC SHOULD BRANCH
3A5C C0 87 5872                5678        B     PRINTM
3A60 49                  3A60  5679        DC    XL1'49'                    ERROR HALT 49
3A61 13                  3A61  5680        DC    IL1'19'
3A62 6160                3A63  5681        DC    AL2(STATE2)
                               5682        B     LINK                       ERROR EXIT
3A66 C0 87 54FE                5683 R39S3A B     DOMICR
3A6A 45                  3A6C  5684        DC    XL1'45'                    ERROR HALT -45-
3A6D 500A                3A6E  5685        DC    XL2'500A'                  3RD EXPECTED RESULTS
3A6F F3 58 E0                  5686        SIO   X'E0',SIOI                 ENABLE MC
3A72 F3 88 C0                  5687        SIO   X'C0',X'88'                ENABLE BSCA
3A75 F3 8A 00                  5688        SIO   X'00',X'8A'                BSCA SIO NON IMMEDIATE TO RST UC
3A78 C1 88 3A8B                5689        TIO   R39E3D,X'88'               BSCA NR/UC. SHOULD NOT BRANCH
3A7C F3 58 80                  5690        SIO   X'80',SICI                 DISABLE RESET 32XX
3A7F C0 87 0216                5691        B     LINK                       BR TO NEXT ROUTINE
                               5692
3A83 C0 87 5872                5693 R39E3A B     PRINTM
3A87 3A                  3A87  5694        DC    XL1'3A'                    ERROR HALT 3A
3A88 0F                  3A88  5695        DC    IL1'15'
3A89 614D                3A8A  5696        DC    AL2(STATB1)
                               5697
3A8B C0 87 5B72                5698 R39E3D B     PRINTM
3A8F 44                  3A8F  5699        DC    XL1'44'                    ERROR HALT 44
3A90 0F                  3A90  5700        DC    IL1'15'
3A91 614D                3A92  5701        DC    AL2(STATE1)
                               5702
                               5703
                               5704 *-----------------------------*
                               5705 * START OF MICROPROGRAM LISTING *
                               5706 *-----------------------------*
3A93 73FF                3A93  5707 R39MCS EQU   *
3A95 2FA3                3A94  5708        DC    XL2'73FF'     000    PUT 'FF' IN HDB 3
3A97 4704                3A96  5709        DC    XL2'2FA3'     001    MOVE IT TO HDB 3F
3A99 5002                3A98  5710        DC    XL2'4704'     002    BSCA ENABLED
3A9B 5004                3A9A  5711        DC    XL2'5002'     003    WAIT & LOOP
3A9D 1104                3A9C  5712        DC    XL2'5004'     004    1ST EXPECTED RESULT
3A9F 5006                3A9E  5713        DC    XL2'1104'     005    SET U/C
3AA1 1104                3AA0  5714        DC    XL2'5006'     006    2ND EXP RESULT
3AA3 BFA3                3AA2  5715        DC    XL2'1104'     007    SET U/C
3AA5 900F                3AA4  5716        DC    XL2'BFA3'     008    TEST HDB 3F STILL = HDB 3
3AA7 500A                3AA6  5717        DC    XL2'900F'     009    BRANCH TO ERROR IF NOT
                         3AA8  5718 R39MCE DC    XL2'500A'     00A    HANG 3RD EXP RESULT
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         5720 ************************************************************
                         5721 * ROUTINE 3B BSCA MODE CYCLE STEAL TEST                   *
                         5722 ************************************************************
                         5723 *
                         5724 *   MACRO 1  CLEAR CYCLE STEAL AREA AND SET LAST BYTE = FF.  *
                         5725 *
                         5726 *            LOAD CRTAR                                     *
                         5727 *
                         5728 *   MICRO 1  TEST BSCA MODE CYCLE STEAL LATCH IS OFF        *
                         5729 *              SET BSCA MODE CYCLE STEAL MODE LATCH ON       *
                         5730 *            TEST FOR ON. SHOULD BE .                       *
                         5731 *
                         5732 *   MACRO 2  ENABLE MC                                      *
                         5733 *            TEST BSCA BUSY-SHOULD NOT BE.                  *
                         5734 *            ENABLE BSCA WITH NON-IMMEDIATE SIO.            *
                         5735 *            LOAD BSCA-2- CURRENT ADDR REG                  *
                         5736 *            TEST BSCA BUSY SHOULD BE.                      *
                         5737 *
                         5738 *   MICRO 2  TEST BSCA ENABLED.                             *
                         5739 *            TEST BSCA MODE CS LATCH, SHOULD BE ON.         *
                         5740 *            DO 4 CYCLE STEAL OPERATIONS USING 'FFAA5528' DATA PATTERN*
                         5741 *
                         5742 *   MACRO 3  COMPARE STORED DATA PATTERN.                   *
                         5743 *            SNS CRTAR FOR SAME AS ORIGINAL. SHOULD BE THE SAME.*
                         5744 *
                         5745 *   MICRO 3  DO 4 FETCH CYCLE STEALS AND COMPARES           *
                         5746 *
                         5747 *   MACRO 4  ENABLE MC
                         5748 *            DISABLE BSCA AND TIO BSCA BUSY. SHOULD NOT BE. *
                         5749 *
                         5750 *   MICRO 4  TEST BSCA MODE CYCLE STEAL LATCH. SHOULD BE ON. *
                         5751 *
                         5752 *   MACRO 5  DISABLE RESET                                  *
                         5753 *            BRANCH TO NEXT ROUTINE                         *
                         5754 *
                         5755 ************************************************************
3AA9 38                  3AA9 5756 RT3B   DC    XL1'3B'          ROUTINE NUMBER
3AAA 00                  3AAA 5757        DC    XL1'00'          NO MANUAL INTERVENTION
3AAB 400C                3AAC 5758        DC    AL2(RT3C)        ADDR OF NEXT ROUTINE
                         5759
                         3ADF 5760        USING R3BG01,XR1
3AAD C2 01 3ADF                 5761        LA    R3BG01,X'1'      INITIALIZE XR1 FOR INDEXING.
                         5762
3AB1 C0 87 021A                 5763        B     PRINT
3AB5 01                  3AB5 5764        DC    XL1'01'
3AB6 22                  3AB6 5765        DC    XL1'34'
3AB7 3ADE                3AB8 5766        DC    AL2(R3BHDR)
3AB9 C0 87 3ADF                 5767        B     R3BG01
3ABD D9D6E4E340F3C240    3ADE 5768 R3BHDR DC    CL34'ROUT 3B BSCA MODE CYCLE STEAL TEST'
3AC5 C2E2C3C140D4D6C4            5768
3ACD C5A0C3E8C3D3C140            5768
3AD5 E2E3C5C1D340E3C5            5768
3ADD E2E3                        5768
3ADF C0 87 5918          3AE3 5769 R3BG01 B     LOADCS           GO LOAD MICROCODE
3AE3 83                  3AE5 5770        DC    XL1'83'
3AE4 3B8F                3AE7 5771        DC    AL2(R3BMCS)
3AE6 3C5A                     5772        DC    AL2(R3BMCE)
                              5773
3AE8 5F 05 D8 D8              5774        SLC   PASTCS(6,XR1),PASTCS(,XR1) CLEAR OUT CYCLE STEAL AREA
3AEC 3C FF 3B89               5775        MVI   BCYSTA,X'FF'             SET LAST CYCLE STEAL BYTE =FF
3AF0 C0 87 54FE               5776        B     COMICR           DO MICROCODE
3AF4 38                  3AF4 5777        DC    XL1'38'          ERROR HALT -38-
3AF5 5004                3AF6 5778        DC    XL2'5004'        FIRST EXPECTED RESULTS
3AF7 F3 58 E0                 5779        SIO   X'E0',SIOI       ENABLE MC
3AFA C1 8A 3814               5780        TIO   BSYER1,X'8A'     TIO BSCA BUSY, SHOULD NOT BE
3AFE F3 88 C0                 5781        SIO   X'C0',X'88'       ENABLE BSCA WITH SIO IMMEDIATE.
3B01 31 8C 388C               5782        LIO   BCYSTL,BSDAR           LOAD BSCA CURRENT ADDR REG
3B05 F3 8A C4                 5783        SIO   X'C4',X'8A'            SIO NON-IMMEDIATE SET BUSY
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

3B08 C1 8A 3B1C                 5784        TIO   R3BMC2,X'8A'     TIO BSCA BUSY
3B0C C0 87 5B72                 5785        B     PRINTM           ERROR HALT -3C-
3B10 3C                  3B10 5786        DC    XL1'3C'
3B11 16                  3B11 5787        DC    IL1'22'
3B12 60F7                3B13 5788        DC    AL2(STATM8)
                                5789
3B14 C0 87 5B72                 5790 BSYER1 B     PRINTM           ERROR HALT -3D-
3B18 3D                  3B18 5791        DC    XL1'3D'
3B19 0F                  3B19 5792        DC    IL1'15'
3B1A 60C2                3B18 5793        DC    AL2(STATM9)
                                5794
3B1C C0 87 54FE                 5795 R3BMC2 B     DOMICR           DO 2ND MICROPROGRAM (STORE CS)
3B20 3E                  3B20 5796        DC    XL1'3E'          ERROR HALT -3E-
3B21 5021                3B22 5797        DC    XL2'5021'        EXPECTED RESULTS
                                5798
3B23 5D 01 57 D8                5799        CLC   R3BEX1(2,XR1),BCYSTA-2(,XR1)  CHECK FIRST 2 BYTES.
3B27 F2 81 0D                   5800        JE    R3BB01           JUMP IF OKAY
382A 1C 01 5FE6 D8              5801        MVC   STATAC,BCYSTA-2(2,XR1) PUT ERROR RESULTS IN STATUS
3B2F C0 87 5DA5                 5802        B     STATUS
3B33 20                  3B33 5803        DC    XL1'20'          PRINT EXP & ACT RESULT
3B34 3F                  3B34 5804        DC    XL1'3F'          ERROR HALT -3F-
3B35 FFAA                3B36 5805 R3BEX1 DC    XL2'FFAA'        EXPECTED RESULTS
                                5806
3B37 5D 01 6B DA                5807 R3BB01 CLC   R3BEX2(2,XR1),BCYSTA(,XR1) CHECK 2ND 2 BYTES
3B3B F2 81 0D                   5808        JE    R3BB02           JUMP IF OKAY
3B3E 1C 01 5FE6 DA              5809        MVC   STATAC,BCYSTA(2,XR1)  PUT ERROR RESULTS IN STATUS
3B43 C0 87 5DA5                 5810        B     STATUS
3B47 20                  3B47 5811        DC    XL1'20'          PRINT EXP & ACT RESULTS
3B48 40                  3B48 5812        DC    XL1'40'          ERROR HALT
3B49 5528                384A 5813 R3BEX2 DC    XL2'5528'        EXPECTED RESULT
                                5814
3B4B 7D 00 D6                   5815 R3BB02 CLI   PRBCS(,XR1),X'00'  FIRST BYTE OF 'B'CS AREA = 00
3B4E F2 01 06                   5816        JNE   R3BB03           JUMP IF NOT - EQUAL
3B51 7D 00 DB                   5817        CLI   PASTCS(,XR1),X'00'  LAST BYTE OF 'B'CS AREA = 00
3B54 F2 81 12                   5818        JE    R3BB05           JUMP AROUND ERROR
3B57 1C 00 5FE5 D6              5819 R3BB03 MVC   STATAC-1,PRBCS(1,XR1) MOVE 1ST BYTE TO STATUS
385C 1C 00 5FE6 DB              5820        MVC   STATAC,PASTCS(1,XR1)  MOVE LAST BYTE TO STATUS
3B61 C0 87 5DA5                 5821        B     STATUS
3B65 20                  3B65 5822        DC    XL1'20'
3B66 41                  3B66 5823        DC    XL1'41'          ERROR HALT -41-
3B67 0000                3B68 5824        DC    XL2'0000'        EXPECTED RESULTS
                                5825
                                5826
3B69 F3 88 80                   5827 R3BB05 SIO   X'80',X'88'
386C C1 8A 3B86                 5828        TIO   BSSER2,X'8A'       DISABLE BSCA
3B70 F3 88 C0                   5829        SIO   X'C0',X'88'       TIO BSCA BUSY SHOULD NOT BE
3B73 31 8C 388C                 5830        LIO   BCYSTL,BSDAR       ENABLE BSCA IMMEDIATE SIO
3B77 F3 8A C4                   5831        SIO   X'C4',X'8A'       LOAD BSCA CURRENT ADDR REG
387A C1 8A 3B96                 5832        TIO   R3BB06,X'8A'       SIO NON IMMEDIATE SET BUSY
387E C0 87 5B72                 5833        B     PRINTM           TIO BSCA BUSY - GO DO MICRO
3B82 44                  3B82 5834        DC    XL1'44'
3B83 16                  3B83 5835        DC    IL1'22'          ERROR HALT -44-
3B84 60F7                3B85 5836        DC    AL2(STATM8)
3B86 C0 87 5B72                 5837 BSSER2 B     PRINTM
3B8A 45                  3B8A 5838        DC    XL1'45'          ERROR HALT -45-
3B8B 0F                  3B8B 5839        DC    IL1'15'
3B8C 60C2                3B8D 5840        DC    AL2(STATM9)
                                5841
3B8E C0 87 5B72                 5842 BSYER3 B     PRINTM
3B92 46                  3B92 5843        DC    XL1'46'          ERROR HALT -46-
3B93 0F                  3B93 5844        DC    IL1'15'
3B94 60C2                3B95 5845        DC    AL2(STATM9)
3B96 C0 87 54FE                 5846 R3BB06 B     DOMICR           DO 3RD MICRO PROGRAM (FETCH CS)
3B9A 42                  3B9A 5847        DC    XL1'42'          ERROR HALT -42-
3B9B 503E                3B9C 5848        DC    XL2'503E'        EXPECTED RESULTS
3B9D F3 58 E0                   5849        SIO   X'E0',SIOI       ENABLE MC
3BA0 F3 88 80                   5850        SIO   X'80',X'88'      DISABLE BSCA
3BA3 C1 8A 3B8E                 5851        TIO   BSYER3,X'8A'     TIO BSCA BUSY SHOULD NOT BE
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    3BA7 C0 87 54FE           5852        B     DOMICR                 DO 4TH MICRO
    3BAB 47              3BAB 5853        DC    XL1'47'                ERROR HALT -47-
    3BAC 504C            3BAD 5854        DC    XL2'504C'              EXPECTED RESULTS
                              5855
    3BAE F3 58 80             5856        SIO   X'80',SIOI             DISABLE RESET
                              5857
    3BB1 C0 87 0216           5858        B     LINK                   BR TO NEXT ROUTINE
    3BB5 00              3BB5 5859 PRBCS  DC    XL1'00'                START OF 'B' CYCLE STEAL AREA
                         3BB6 5860 BCYST  EQU   *
    3BB6 00000000        3BB9 5861 BCYSTA DC    XL4'0'                 ACTUAL CYCLE STEAL AREA
    3BBA 00              3BBA 5862 PASTCS DC    XL1'0'                 END OF 'B' CYCLE STEAL AREA
    3BBB 3BB6            3BBC 5863 BCYSTL DC    AL2(BCYST)             ADDRESS OF CYCLE STEAL AREA
    3BBD 0000            3BBE 5864 CCYSTL DC    XL2'00'                SNS CRTAR HERE
                              5865 *------------------------------*
                              5866 * START OF MICROPROGRAM LISTING *
                              5867 *------------------------------*
                         3BBF 5868 R3BMCS EQU   *
    3BBF 4500            3BC0 5869        DC    XL2'4500'    000   TSN BSCA MODE CS LATCH SHCULD BE OFF
    3BC1 1504            3BC2 5870        DC    XL2'1504'    001   SSN.5 SET BSCA MODE LATCH ON
    3BC3 4504            3BC4 5871        DC    XL2'4504'    002   TSN.5 BSCA MODE LATCH ON? SHOULD BE.
    3BC5 5003            3BC6 5872        DC    XL2'5003'    003   BOS.0 ERROR HANG
    3BC7 5004            3BC8 5873        DC    XL2'5004'    004   BCS.0 1ST EXPECTED RESULTS
    3BC9 5807            3BCA 5874        DC    XL2'5807'    005   BOS.2  BR IF SIO SVC REQ
    3BCB 5005            3BCC 5875        DC    XL2'5005'    006   BOS.0 LOOP & WAIT
    3BCD 1504            3BCE 5876        DC    XL2'1504'    007   SSN SET BSCA MODE CS LATCH ON
    3BCF 450A            3BD0 5877        DC    XL2'450A'    008   TSN BSCA MODE LATCH SHOULD BE ON
    3BD1 5009            3BD2 5878        DC    XL2'5009'    009   ERROR HANG
    3BD3 500B            3BD4 5879        DC    XL2'500B'    00A   BCS.0 NEXT ADDR - DUMMY CYCLE
    3BD5 500C            3BD6 5880        DC    XL2'500C'    00B   BOS.0 NEXT ADDR - DUMMY CYCLE
    3BD7 500D            3BD8 5881        DC    XL2'500D'    00C   BCS.0 NEXT ADDR - DUMMY CYCLE
    3BD9 7FFF            3BDA 5882        DC    XL2'7FFF'    00D   IC SET HDB OF=FF
    3BDB 1904            3BDC 5883        DC    XL2'1904'    00E   SSN. SET STORE CYCLE STEAL LATCH ON
    3BDD 4811            3BDE 5884        DC    XL2'4811'    00F   TSN. TEST STORE CSR .MUST BE ON
    3BDF 5010            3BE0 5885        DC    XL2'5010'    010   ERROR HANG
    3BE1 4811            3BE2 5886        DC    XL2'4811'    011   TSN WAIT FOR STORE CSR.TO GO OFF
    3BE3 7FAA            3BE4 5887        DC    XL2'7FAA'    012   IC SET HDB OF=AA
    3BE5 1904            3BE6 5888        DC    XL2'1904'    013   SSN SET STORE CS LATCH ON
    3BE7 4816            3BE8 5889        DC    XL2'4816'    014   TSN TEST STORE CS SR.MUST BE ON
    3BE9 5015            3BEA 5890        DC    XL2'5015'    015   ERROR HANG
    3BEB 4816            3BEC 5891        DC    XL2'4816'    016   TSN WAIT FOR STORE CSR.TO GO OFF
    3BED 7F55            3BEE 5892        DC    XL2'7F55'    017   IC. SET HDB OF=55
    3BEF 1904            3BF0 5893        DC    XL2'1904'    018   SSN. SET STORE CS LATCH ON
    3BF1 481B            3BF2 5894        DC    XL2'481B'    019   TSN TEST STORE CSR.MUST BE ON
    3BF3 501A            3BF4 5895        DC    XL2'501A'    01A   ERROR HANG
    3BF5 481B            3BF6 5896        DC    XL2'481B'    01B   TSN WAIT FOR STORE CSR.TO GO OFF
    3BF7 7F28            3BF8 5897        DC    XL2'7F28'    01C   IC. SET HDB OF=28
    3BF9 1904            3BFA 5898        DC    XL2'1904'    01D   SSN SET STORE CS LATCH ON
    3BFB 4820            3BFC 5899        DC    XL2'4820'    01E   TSN TEST STORE CSR. MUST BE ON
    3BFD 501F            3BFE 5900        DC    XL2'501F'    01F   ERROR HANG
    3BFF 4820            3C00 5901        DC    XL2'4820'    020   TSN WAIT FOR STORE CSR.TO GO OFF
    3C01 5021            3C02 5902        DC    XL2'5021'    021   BCS,0 2ND EXPECTED RESULTS
                              5903 *  THE NEXT PART IS ENTERED TO TEST FETCH CYCLE STEAL IN BSCA MODE.
    3C03 5042            3C04 5904        DC    XL2'5042'    022   BOS,0 GO DO SET UP FOR FETCH.
    3C05 5024            3C06 5905        DC    XL2'5024'    023   BCS.0 DUMMY
    3C07 5025            3C08 5906        DC    XL2'5025'    024   BOS,0 DUMMY
    3C09 5026            3C0A 5907        DC    XL2'5026'    025   BCS.0 DUMMY
    3C0B EFFF            3C0C 5908        DC    XL2'EFFF'    026   CI TEST HDB OF=FF
    3C0D 9C29            3C0E 5909        DC    XL2'9C29'    027   BOC.3 MUST BRANCH
    3C0F 5028            3C10 5910        DC    XL2'5028'    028   ERROR HANG
    3C11 1804            3C12 5911        DC    XL2'1804'    029   SSN SET FETCH CS LATCH ON
    3C13 482C            3C14 5912        DC    XL2'482C'    02A   TSN TEST FETCH CSR.MUST BE ON
    3C15 5028            3C16 5913        DC    XL2'5028'    02B   ERROR HANG
    3C17 482C            3C18 5914        DC    XL2'482C'    02C   TSN WAIT FOR FETCH CSR.TO GO OFF
    3C19 EFAA            3C1A 5915        DC    XL2'EFAA'    02D   CI TEST HDB OF=AA
    3C1B 9C30            3C1C 5916        DC    XL2'9C30'    02E   BCC.3 MUST BRANCH
    3C1D 502F            3C1E 5917        DC    XL2'502F'    02F   ERROR HANG
    3C1F 1804            3C20 5918        DC    XL2'1804'    030   SSN SET FETCH CS LATCH ON
    3C21 4833            3C22 5919        DC    XL2'4833'    031   TSN TEST FETCH CSR.MUST BE ON
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    3C23 5032            3C24 5920        DC    XL2'5032'    032   ERROR HANG
    3C25 4833            3C26 5921        DC    XL2'4833'    033   TSN WAIT FOR FETCH CSR.TO GO OFF
    3C27 EF55            3C28 5922        DC    XL2'EF55'    034   CI. TEST HDB OF=55
    3C29 9C37            3C2A 5923        DC    XL2'9C37'    035   BCS.3 MUST BRANCH
    3C2B 5036            3C2C 5924        DC    XL2'5036'    036   ERROR HANG
    3C2D 1804            3C2E 5925        DC    XL2'1804'    037   SSN SET FETCH CS LATCH ON
    3C2F 483A            3C30 5926        DC    XL2'483A'    038   TSN TEST FETCH CSR.MUST BE ON
    3C31 5039            3C32 5927        DC    XL2'5039'    039   ERROR HANG
    3C33 483A            3C34 5928        DC    XL2'483A'    03A   TSN WAIT FOR FETCH CSR.TO GO OFF
    3C35 EF28            3C36 5929        DC    XL2'EF28'    03B   CI TEST HDB OF=28
    3C37 9C3E            3C38 5930        DC    XL2'9C3E'    03C   BOS.3 MUST BRANCH
    3C39 503D            3C3A 5931        DC    XL2'503D'    03D   ERROR HANG
    3C3B 503E            3C3C 5932        DC    XL2'503E'    03E   BOS.0 3RD EXPECTED RESULTS
    3C3D 4541            3C3E 5933        DC    XL2'4541'    03F   TSN TEST BSCA CS LATCH SHOULD BE.
    3C3F 5040            3C40 5934        DC    XL2'5040'    040   ERROR HANG
    3C41 504A            3C42 5935        DC    XL2'504A'    041   BOS.0 TO ADDR.04A
    3C43 1504            3C44 5936        DC    XL2'1504'    042   SSN.5 ALT CYCLE STEAL
    3C45 4545            3C46 5937        DC    XL2'4545'    043   TSN.5 BR IF ON.
    3C47 5044            3C48 5938        DC    XL2'5044'    044   BOS.0 ERROR HANG
    3C49 1804            3C4A 5939        DC    XL2'1804'    045   SSN.SET FETCH C.S.
    3C4B 4848            3C4C 5940        DC    XL2'4848'    046   TSN. TEST FETCH C.S. ON
    3C4D 5047            3C4E 5941        DC    XL2'5047'    047   BOS.0 ERROR HANG
    3C4F 4848            3C50 5942        DC    XL2'4848'    048   TSN. WAIT FOR C.S. TO GO OFF.
    3C51 5026            3C52 5943        DC    XL2'5026'    049   RTN TO FETCH OP.
    3C53 1308            3C54 5944        DC    XL2'1308'    04A   SSF.3 RESET BSCA C.S. LATCH
    3C55 454D            3C56 5945        DC    XL2'454D'    04B   TSN.5 TEST BSCA C.S. LATCH,BR OTO 04D
    3C57 504C            3C58 5946        DC    XL2'504C'    04C   BOS.0 4TH EXPECTED RESULT
    3C59 504D            3C5A 5947 R3BMCE DC    XL2'504D'    04D   BOS,0ERROR HANG
                              5948
                              5948
                              5949 ****** C A U T I O N ******** DO NCT MOVE THE FOLLOWING CODE.
                              5950 ****** IT MUST REMAIN ORG'D AT THIS LOCATION TO AGREE WITH U.G.
                              5951
    3FBE                      5952        ORG   X'3FBE'                ORG CE MICRCPROGRAM STUFF
    3FBE 5000            3FBF 5953 R2BEXD DC    XL2'5000'              .INSERT STOP ADDR. IN LO BYTE
                         3FC0 5954 R2BMCS EQU   *
    3FC0 5000500150025003 3FD3 5955       DC    XL20'50005001500250035004500550065007500850 09'
    3FC8 5004500550065007     5955
    3FD0 50085009             5955
    3FD4 500A500B500C500D 3FE7 5956       DC    XL20'500A500B500C500D500E500F501050115012 5013'
    3FDC 500E500F50105011     5956
    3FE4 50125013             5956
    3FE8 5014501550165017 3FFB 5957       DC    XL20'5014501550165017501850195 01A501B501C501D'
    3FF0 501850195 01A501B     5957
    3FF8 501C501D             5957
    3FFC 501E501F        3FFF 5958 R2BMCE DC    XL4'501E501F'
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                            5960 ********************************************************************
                            5961 * ROUTINE 3C.                                                      *
                            5962 * SERIAL WRAP THROUGH IDA DRIVER RECEIVERS. (AS DEFINED IN UDT.)  *
                            5963 ********************************************************************
   4000 3C                  4000 5964 RT3C   DC    XL1'3C'                  ROUTINE NO.
   4001 00                  4001 5965        DC    XL1'00'
   4002 453B                4003 5966        DC    AL2(RT3D)
   4004 C0 87 021A               5967        B     PRINT                    PRINT ROUT TITLE
   4008 01                  4008 5968        DC    XL1'01'
   4009 1C                  4009 5969        DC    IL1'28'
   400A 402B                400B 5970        DC    AL2(R3CTTL)
   400C C0 87 402C               5971        B     DOR3C
   4010 D9D6E4E340F3C340 402B    5972 R3CTTL DC    CL28'ROUT 3C DRIVER/RECEIVER WRAP'
   4018 C4D9C9E5C5D961D9         5972
   4020 C5C3C5C9E5C5D140         5972
   4028 E6D9C1D7                 5972
                                 5973 *
                                 5974 * FIRST A WRAP WITH NO DRIVER/RECEIVER SELECTED.
                                 5975 * THE WRAP SHOULD NOT WORK.
   402C 0C 01 3022 303A          5976 DOR3C  MVC   R1FMCE-6(2),HDB900           NO BIT ON IN HDB 9
   4032 0C 01 3024 303C          5977        MVC   R1FMCE-4(2),LISELA           DESELECT W/DECODE A (AGAIN.)
   4038 0C 01 3026 3048          5978        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   403E C0 87 5918               5979        B     LOADCS                       LOAD MICROPROGRAM
   4042 83                  4042 5980        DC    XL1'83'
   4043 2FA7                4044 5981        DC    AL2(R1FMCS)
   4045 3028                4046 5982        DC    AL2(R1FMCE)
   4047 31 48 453A               5983        LIO   X0343,HDB0                   LIO VALUE TO BE USED.
   404B 3C 10 5564               5984        MVI   LPCNT,X'10'                  INCREASE MICROPROGRAM TIME.
   404F C0 87 54FE               5985        B     DOMICR
   4053 5F                  4053 5986        DC    XL1'5F'                      ERROR HALT -5F-
   4054 501C                4055 5987        DC    XL2'501C'                    EXPECTED RESULTS
                                 5988 *
                                 5989 * NOW TEST FIRST 3 DRIVER/RECEIVER CIRCUITS. (BASIC)
   4056 0C 01 3022 303A          5990        MVC   R1FMCE-6(2),HDB980           BIT 0
   405C 0C 01 3024 303C          5991        MVC   R1FMCE-4(2),LISELA           LINE SEL A
   4062 0C 01 3026 3048          5992        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   4068 3C 40 4538               5993        MVI   DEVADR,X'40'                 ADDR 40
   406C 3C 10 4443               5994        MVI   WRAPEH,X'10'                 ERROR 10
   4070 C0 87 4426               5995        B     WRAP
   4074 0C 01 3022 303C          5996        MVC   R1FMCE-6(2),HDB940           BIT 1
   407A 0C 01 3024 303C          5997        MVC   R1FMCE-4(2),LISELA           LINE SEL A
   4080 0C 01 3026 3048          5998        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   4086 3C C1 4538               5999        MVI   DEVADR,X'C1'                 ADDR C1
   408A 3C 11 4443               6000        MVI   WRAPEH,X'11'                 ERROR 11
   408E C0 87 4426               6001        B     WRAP
   4092 0C 01 3022 303E          6002        MVC   R1FMCE-6(2),HDB920           BIT 2
   4098 0C 01 3024 303C          6003        MVC   R1FMCE-4(2),LISELA           LINE SEL A
   409E 0C 01 3026 3049          6004        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   40A4 3C C2 4538               6005        MVI   DEVADR,X'C2'                 ADDR C2
   40A8 3C 12 4443               6006        MVI   WRAPEH,X'12'                 ERROR 12
   40AC C0 87 4426               6007        B     WRAP
                                 6008 * CHECK FOR TEX1 FEATURE.
                                 6009 * TEST 3 LINES IF PRESENT.
                                 6010 * EXIT IF NOT.
   40B0 38 08 0A0C               6011        TBN   UDT2,X'08'
   40B4 C0 90 0216               6012        BF    LINK
   40B8 0C 01 3022 3030          6013        MVC   R1FMCE-6(2),HDB910           BIT 3
   40BE 0C 01 3024 303C          6014        MVC   R1FMCE-4(2),LISELA           LINE SEL A
   40C4 0C 01 3026 3048          6015        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   40CA 3C C3 4538               6016        MVI   DEVADR,X'C3'                 ADDR C3
   40CE 3C 13 4443               6017        MVI   WRAPEH,X'13'                 ERROR 13
   40D2 C0 87 4426               6018        B     WRAP
   40D6 0C 01 3022 3032          6019        MVC   R1FMCE-6(2),HDB908           BIT 4
   40DC 0C 01 3024 303C          6020        MVC   R1FMCE-4(2),LISELA           LINE SEL A
   40E2 0C 01 3026 3048          6021        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   40E8 3C C4 4538               6022        MVI   DEVADR,X'C4'                 ADDR C4
   40EC 3C 14 4443               6023        MVI   WRAPEH,X'14'                 ERROR 14
   40F0 C0 87 4426               6024        B     WRAP
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   40F4 0C 01 3022 3034          6025        MVC   R1FMCE-6(2),HDB904           BIT 5
   40FA 0C 01 3024 303C          6026        MVC   R1FMCE-4(2),LISELA           LINE SEL A
   4100 0C 01 3026 3048          6027        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   4106 3C C5 4538               6028        MVI   DEVADR,X'C5'                 ADDR C5
   410A 3C 15 4443               6029        MVI   WRAPEH,X'15'                 ERROR 15
   410E C0 87 4426               6030        B     WRAP
                                 6031 * CHECK FOR TEX 2 FEATURE.
                                 6032 * TEST 3 LINES IF PRESENT.
                                 6033 * EXIT IF NOT.
   4112 38 10 0A0C               6034        TBN   UDT2,X'10'
   4116 C0 90 0216               6035        BF    LINK
   411A 0C 01 3022 3036          6036        MVC   R1FMCE-6(2),HDB902           BIT 6
   4120 0C 01 3024 303E          6037        MVC   R1FMCE-4(2),LISELB           LINE SEL B
   4126 0C 01 3026 3048          6038        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   412C 3C C6 4538               6039        MVI   DEVADR,X'C6'                 ADDR C6
   4130 3C 16 4443               6040        MVI   WRAPEH,X'16'                 ERROR 16
   4134 C0 87 4426               6041        B     WRAP
   4138 0C 01 3022 3038          6042        MVC   R1FMCE-6(2),HDB901           BIT 7
   413E 0C 01 3024 303E          6043        MVC   R1FMCE-4(2),LISELB           LINE SEL B
   4144 0C 01 3026 3048          6044        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   414A 3C C7 4538               6045        MVI   DEVADR,X'C7'                 ADDR C7
   414E 3C 17 4443               6046        MVI   WRAPEH,X'17'                 ERROR 17
   4152 C0 87 4426               6047        B     WRAP
   4156 0C 01 3022 302A          6048        MVC   R1FMCE-6(2),HDB980           BIT 0
   415C 0C 01 3024 303E          6049        MVC   R1FMCE-4(2),LISELB           LINE SEL B
   4162 0C 01 3026 3048          6050        MVC   R1FMCE-2(2),WRPOUT           DIAG OFF
   4168 3C C8 4538               6051        MVI   DEVADR,X'C8'                 ADDR C8
   416C 3C 20 4443               6052        MVI   WRAPEH,X'20'                 ERROR 20
   4170 C0 87 4426               6053        B     WRAP
                                 6054 * CHECK FOR TEX 3 FEATURE.
                                 6055 * TEST 3 LINES IF PRESENT.
                                 6056 * EXIT IF NOT
   4174 38 20 0A0C               6057        TBN   UDT2,X'20'
   4178 C0 90 0216               6058        BF    LINK
   417C 0C 01 3022 302C          6059        MVC   R1FMCE-6(2),HDB940           BIT 1
   4182 0C 01 3024 303E          6060        MVC   R1FMCE-4(2),LISELB           LINE SEL B
   4188 0C 01 3026 3048          6061        MVC   R1FMCE-2(2),WRPOUT           OUTSIDE WRAP
   418E 3C C9 4538               6062        MVI   DEVADR,X'C9'                 ADDR C9
   4192 3C 21 4443               6063        MVI   WRAPEH,X'21'                 ERROR 21
   4196 C0 87 4426               6064        B     WRAP
   419A 0C 01 3022 302E          6065        MVC   R1FMCE-6(2),HDB920           BIT 2
   41A0 0C 01 3024 303E          6066        MVC   R1FMCE-4(2),LISELB           LINE SEL B
   41A6 0C 01 3026 3048          6067        MVC   R1FMCE-2(2),WRPOUT           OUTSIDE WRAP
   41AC 3C 4A 4538               6068        MVI   DEVADR,X'4A'                 ADDR 4A
   41B0 3C 22 4443               6069        MVI   WRAPEH,X'22'                 ERROR 22
   41B4 C0 87 4426               6070        B     WRAP
   41B8 0C 01 3022 3030          6071        MVC   R1FMCE-6(2),HDB910           BIT 3
   41BE 0C 01 3024 303E          6072        MVC   R1FMCE-4(2),LISELB           LINE SEL B
   41C4 0C 01 3026 3048          6073        MVC   R1FMCE-2(2),WRPOUT           OUTSIDE WRAP
   41CA 3C 4B 4538               6074        MVI   DEVADR,X'4B'                 ADDR 4B
   41CE 3C 23 4443               6075        MVI   WRAPEH,X'23'                 ERROR 23
   41D2 C0 87 4426               6076        B     WRAP
                                 6077 * CHECK FOR TEX 4 FEATURE.
                                 6078 * TEST 3 LINES IF PRESENT.
                                 6079 * EXIT IF NOT
   41D6 38 40 0A0C               6080        TBN   UDT2,X'40'
   41DA C0 90 0216               6081        BF    LINK
   41DE 0C 01 3022 3032          6082        MVC   R1FMCE-6(2),HDB908           BIT 4
   41E4 0C 01 3024 3040          6083        MVC   R1FMCE-4(2),LISELC           LINE SEL C
   41EA 0C 01 3026 3048          6084        MVC   R1FMCE-2(2),WRPOUT           OUTSIDE WRAP
   41F0 3C 4C 4538               6085        MVI   DEVADR,X'4C'                 ADDR 4C
   41F4 3C 34 4443               6086        MVI   WRAPEH,X'34'                 ERROR 34
   41F8 C0 87 4426               6087        B     WRAP
   41FC 0C 01 3022 3034          6088        MVC   R1FMCE-6(2),HDB904           BIT 5
   4202 0C 01 3024 3040          6089        MVC   R1FMCE-4(2),LISELC           LINE SEL C
   4208 0C 01 3026 3048          6090        MVC   R1FMCE-2(2),WRPOUT           OUTSIDE WRAP
   420E 3C 4D 4538               6091        MVI   DEVADR,X'4D'                 ADDR 4D
   4212 3C 35 4443               6092        MVI   WRAPEH,X'35'                 ERROR 35
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   4216 C0 87 4426            6093         B     WRAP
   421A 0C 01 3022 3036       6094         MVC   R1FMCE-6(2),HDB902      BIT 6
   4220 0C 01 3024 3040       6095         MVC   R1FMCE-4(2),LISELC      LINE SEL C
   4226 0C 01 3026 3048       6096         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   422C 3C 4E 4538            6097         MVI   DEVADR,X'4E'            ADDR 4E
   4230 3C 36 4443            6098         MVI   WRAPEH,X'36'            ERROR 36
   4234 C0 87 4426            6099         B     WRAP
                              6100 * CHECK FOR TEX 5 FEATURE.
                              6101 * TEST 3 LINES IF PRESENT.
                              6102 * EXIT IF NOT
   4238 38 80 0A0C            6103         TBN   UDT2,X'80'
   423C C0 90 0216            6104         BF    LINK
   4240 0C 01 3022 3038       6105         MVC   R1FMCE-6(2),HDB901      BIT 7
   4246 0C 01 3024 3040       6106         MVC   R1FMCE-4(2),LISELC      LINE SEL C
   424C 0C 01 3026 3048       6107         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   4252 3C 4F 4538            6108         MVI   DEVADR,X'4F'            ADDR 4F
   4256 3C 37 4443            6109         MVI   WRAPEH,X'37'            ERROR 37
   425A C0 87 4426            6110         B     WRAP
   425E 0C 01 3022 303A       6111         MVC   R1FMCE-6(2),HDB980      BIT 0
   4264 0C 01 3024 3040       6112         MVC   R1FMCE-4(2),LISELC      LINE SEL C
   426A 0C 01 3026 3048       6113         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   4270 3C 50 4538            6114         MVI   DEVADR,X'50'            ADDR 50
   4274 3C 30 4443            6115         MVI   WRAPEH,X'30'            ERROR 30
   4278 C0 87 4426            6116         B     WRAP
   427C 0C 01 3022 303C       6117         MVC   R1FMCE-6(2),HDB940      BIT 1
   4282 0C 01 3024 3040       6118         MVC   R1FMCE-4(2),LISELC      LINE SEL C
   4288 0C 01 3026 3048       6119         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   428E 3C D1 4538            6120         MVI   DEVADR,X'D1'            ADDR D1
   4292 3C 31 4443            6121         MVI   WRAPEH,X'31'            ERROR 31
   4296 C0 87 4426            6122         B     WRAP
                              6123 * CHECK FOR TEX 6 FEATURE.
                              6124 * TEST 3 LINES IF PRESENT.
                              6125 * EXIT IF NOT
   429A 38 01 0A0B            6126         TBN   UDT2-1,X'01'
   429E C0 90 0216            6127         BF    LINK
   42A2 0C 01 3022 303E       6128         MVC   R1FMCE-6(2),HDB920      BIT 2
   42A8 0C 01 3024 3042       6129         MVC   R1FMCE-4(2),LISELD      LINE SEL D
   42AE 0C 01 3026 3048       6130         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   42B4 3C D2 4538            6131         MVI   DEVADR,X'D2'            ADDR D2
   42B8 3C 42 4443            6132         MVI   WRAPEH,X'42'            ERROR 42
   42BC C0 87 4426            6133         B     WRAP
   42C0 0C 01 3022 3030       6134         MVC   R1FMCE-6(2),HDB910      BIT 3
   42C6 0C 01 3024 3042       6135         MVC   R1FMCE-4(2),LISELD      LINE SEL D
   42CC 0C 01 3026 3048       6136         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   42D2 3C D3 4538            6137         MVI   DEVADR,X'D3'            ADDR D3
   42D6 3C 43 4443            6138         MVI   WRAPEH,X'43'            ERROR 43
   42DA C0 87 4426            6139         B     WRAP
   42DE 0C 01 3022 3032       6140         MVC   R1FMCE-6(2),HDB908      BIT 4
   42E4 0C 01 3024 3042       6141         MVC   R1FMCE-4(2),LISELD      LINE SEL D
   42EA 0C 01 3026 3048       6142         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   42F0 3C D4 4538            6143         MVI   DEVADR,X'D4'            ADDR D4
   42F4 3C 44 4443            6144         MVI   WRAPEH,X'44'            ERROR 44
   42F8 C0 87 4426            6145         B     WRAP
                              6146 * CHECK FOR TEX 7 FEATURE.
                              6147 * TEST 3 LINES IF PRESENT.
                              6148 * EXIT IF NOT
   42FC 38 02 0A0B            6149         TBN   UDT2-1,X'02'
   4300 C0 90 0216            6150         BF    LINK
   4304 0C 01 3022 3034       6151         MVC   R1FMCE-6(2),HDB904      BIT 5
   430A 0C 01 3024 3042       6152         MVC   R1FMCE-4(2),LISELD      LINE SEL D
   4310 0C 01 3026 3048       6153         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   4316 3C D5 4538            6154         MVI   DEVADR,X'D5'            ADDR D5
   431A 3C 45 4443            6155         MVI   WRAPEH,X'45'            ERROR 45
   431E C0 87 4426            6156         B     WRAP
   4322 0C 01 3022 3036       6157         MVC   R1FMCE-6(2),HDB902      BIT 6
   4328 0C 01 3024 3042       6158         MVC   R1FMCE-4(2),LISELD      LINE SEL D
   432E 0C 01 3026 3048       6159         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   4334 3C D6 4538            6160         MVI   DEVADR,X'D6'            ADDR D6
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   4338 3C 46 4443            6161         MVI   WRAPEH,X'46'            ERROR 46
   433C C0 87 4426            6162         B     WRAP
   4340 0C 01 3022 3038       6163         MVC   R1FMCE-6(2),HDB901      BIT 7
   4346 0C 01 3024 3042       6164         MVC   R1FMCE-4(2),LISELD      LINE SEL D
   434C 0C 01 3026 3048       6165         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   4352 3C D7 4538            6166         MVI   DEVADR,X'D7'            ADDR D7
   4356 3C 47 4443            6167         MVI   WRAPEH,X'47'            ERROR 47
   435A C0 87 4426            6168         B     WRAP
                              6169 * CHECK FOR TEX 8 FEATURE.
                              6170 * TEST 3 LINES IF PRESENT.
                              6171 * EXIT IF NOT
   435E 38 04 0A0B            6172         TBN   UDT2-1,X'04'
   4362 C0 90 0216            6173         BF    LINK
   4366 0C 01 3022 303A       6174         MVC   R1FMCE-6(2),HDB980      BIT 0
   436C 0C 01 3024 3044       6175         MVC   R1FMCE-4(2),LISELE      LINE SEL E
   4372 0C 01 3026 3048       6176         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   4378 3C D8 4538            6177         MVI   DEVADR,X'D8'            ADDR D8
   437C 3C 50 4443            6178         MVI   WRAPEH,X'50'            ERROR 50
   4380 C0 87 4426            6179         B     WRAP
   4384 0C 01 3022 303C       6180         MVC   R1FMCE-6(2),HDB940      BIT 1
   438A 0C 01 3024 3044       6181         MVC   R1FMCE-4(2),LISELE      LINE SEL E
   4390 0C 01 3026 3048       6182         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   4396 3C D9 4538            6183         MVI   DEVADR,X'D9'            ADDR D9
   439A 3C 51 4443            6184         MVI   WRAPEH,X'51'            ERROR 51
   439E C0 87 4426            6185         B     WRAP
   43A2 0C 01 3022 302E       6186         MVC   R1FMCE-6(2),HDB920      BIT 2
   43A8 0C 01 3024 3044       6187         MVC   R1FMCE-4(2),LISELE      LINE SEL E
   43AE 0C 01 3026 3048       6188         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   43B4 3C 5A 4538            6189         MVI   DEVADR,X'5A'            ADDR 5A
   43B8 3C 52 4443            6190         MVI   WRAPEH,X'52'            ERROR 52
   43BC C0 87 4426            6191         B     WRAP
                              6192 * CHECK FOR TEX 9 FEATURE.
                              6193 * TEST 3 LINES IF PRESENT.
                              6194 * EXIT IF NOT
   43C0 38 08 0A0B            6195         TBN   UDT2-1,X'08'
   43C4 C0 90 0216            6196         BF    LINK
   43C8 0C 01 3022 3030       6197         MVC   R1FMCE-6(2),HDB910      BIT 3
   43CE 0C 01 3024 3044       6198         MVC   R1FMCE-4(2),LISELE      LINE SEL E
   43D4 0C 01 3026 3048       6199         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   43DA 3C 5B 4538            6200         MVI   DEVADR,X'5B'            ADDR 5B
   43DE 3C 53 4443            6201         MVI   WRAPEH,X'53'            ERROR 53
   43E2 C0 87 4426            6202         B     WRAP
   43E6 0C 01 3022 3032       6203         MVC   R1FMCE-6(2),HDB908      BIT 4
   43EC 0C 01 3024 3044       6204         MVC   R1FMCE-4(2),LISELE      LINE SEL E
   43F2 0C 01 3026 3048       6205         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   43F8 3C 5C 4538            6206         MVI   DEVADR,X'5C'            ADDR 5C
   43FC 3C 54 4443            6207         MVI   WRAPEH,X'54'            ERROR 54
   4400 C0 87 4426            6208         B     WRAP
   4404 0C 01 3022 3034       6209         MVC   R1FMCE-6(2),HDB904      BIT 5
   440A 0C 01 3024 3044       6210         MVC   R1FMCE-4(2),LISELE      LINE SEL E
   4410 0C 01 3026 3048       6211         MVC   R1FMCE-2(2),WRPOUT      OUTSIDE WRAP
   4416 3C 5D 4538            6212         MVI   DEVADR,X'5D'            ADDR 5D
   441A 3C 55 4443            6213         MVI   WRAPEH,X'55'            ERROR 55
   441E C0 87 4426            6214         B     WRAP
   4422 C0 87 0216            6215         B     LINK
                              6216 ********************************************************************
                              6217
                              6218 ********************************************************************
                              6219 *  WRAP SUBROUTINE.                                                *
                              6220 ********************************************************************
                              6221
   4426 34 06 4483            6222 WRAP    ST    WRAPEX+3,ARR            SAVE ARR
   442A C0 87 5918            6223         B     LOADCS                  LOAD MICROCODE
   442E 83                    6224         DC    XL1'83'                    DISABLE UPON ENTRY.
   442F 2FA7                  6225         DC    AL2(R1FMCS)                START
   4431 3028                  6226         DC    AL2(R1FMCE)                FINISH
   4433 31 48 453A            6227         LIO   X0343,HDB0              LOAD VALUE TO BE USED.
   4437 3C 10 5564            6228         MVI   LPCNT,X'10'             INCREASE MICROPROGRAM TIME.
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ERR LOC OBJECT CODE       ADDR  STMT SOURCE STATEMENT

   443B 3A 01 554D              6229         SBN   EHBP,X'01'          SET ON ERROR HALT BYPASS BIT.
   443F C0 87 54FE              6230         B     DCMICR              BRANCH TO DO MICROPROGRAM
   4443 00                4443  6231 WRAPEH  DC    XL1'00'             ERROR HALT CODE
   4444 5037              4445  6232 RAPEXP  DC    XL2'5037'           EXPECTED HALT
   4446 0D 01 4445 5F66         6233         CLC   RAPEXP(2),STATAC    CHECK IF ERROR OCCURRED.
   444C F2 81 31                6234         JE    WRAPEX              JUMP IF NOT
   444F C0 87 021A              6235         B     PRINT
   4453 81                4453  6236         DC    XL1'81'
   4454 3D                4454  6237         DC    IL1'61'
   4455 44DC              4456  6238         DC    AL2(COAX1)
   4457 C0 87 021A              6239         B     PRINT
   445B 81                445B  6240         DC    XL1'81'
   445C 34                445C  6241         DC    IL1'52'
   445D 4510              445E  6242         DC    AL2(COAX2)
   445F C0 87 021A              6243         B     PRINT
   4463 82                4463  6244         DC    XL1'82'
   4464 27                4464  6245         DC    IL1'39'
   4465 4537              4466  6246         DC    AL2(COAX3)
   4467 C0 87 021E              6247         B     UNPACK
   4468 01                4468  6248         DC    XL1'01'
   446C 4538              446D  6249         DC    AL2(DEVADR)
   446E 449F              446F  6250         DC    AL2(ADRMSG)
   4470 C0 87 021A              6251         B     PRINT
   4474 82                4474  6252         DC    XL1'82'
   4475 1C                4475  6253         DC    IL1'28'
   4476 449F              4477  6254         DC    AL2(ADRMSG)
   4478 C0 87 525A              6255         B     PIOREG              GO PRINT I/O REG
   447C C0 87 0216              6256         B     LINK
   4480 C0 87 4480              6257 WRAPEX  B     *                   RETURN
                                6258
   4484 C6C1C9D3C9D5C740 449F   6259 ADRMSG  DC    CL28'FAILING DEVICE ADDRESS IS XX'
   448C C4C5E5C9C3C54 0C1       6259
   4494 C4C4D9C5E2E24 0C9       6259
   449C E240E7E7                6259
   44A0 D7D6E6C5D960D 6C6 44CF  6260         DC    CL48'POWER-OFF OR OPEN COAX AT A TERMINAL MIGHT CAUSE'
   44A8 C640D6D940D6D 7C5       6260
   44B0 D540C3D6C1E74 0C1       6260
   44B8 E340C140E3C5D 5D4       6260
   44C0 C9D5C1D340D4C 5C7       6260
   44C8 C8E340C3C1E4E 2C5       6260
   44D0 40E3C8C9E240C 6C1 44DC  6261 COAX1   DC    CL13' THIS FAILURE'
   44D8 C9D3E4D9C5              6261
   44DD D6D7C5D5C9D5C 740 4504  6262         DC    CL40'OPENING THE COAX AT THE CPU WILL AVOID T'
   44E5 E3C8C540C3D6C 1E7       6262
   44ED 40C1E340E3C8C 640       6262
   44F5 C3D7E440E6C9D 3D3       6262
   44FD 40C1E5D6C9C44 0E3       6262
   4505 C8C9E240C5E7D 706 4510  6263 COAX2   DC    CL12'HIS EXPOSURE'
   450D E2E4D9C5                6263
   4511 5C5C5C40C2C54 0E2 4537  6264 COAX3   DC    CL39'*** BE SURE TO RECONNECT AFTER TEST ***'
   4519 E4D9C540E3D64 0D9       6264
   4521 C5C3D6D5D5C5C 3E3       6264
   4529 40C1C6E3C5D94 0E3       6264
   4531 C5E2E3405C5C5 0         6264
   4538 00                4538  6265 DEVADR  DC    XL1'00'             DEVICE ADDR.
   4539 0343              453A  6266 X0343   DC    XL2'0343'
                                6267 * END OF WRAP SUBROUTINE
                                6268 ************************************************************************
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ERR LOC OBJECT CODE       ADDR  STMT SOURCE STATEMENT

                                6270 ************************************************************************
                                6271 * ROUTINES 3D,3E.          SPARE.                                      *
                                6272 ************************************************************************
   453B 3D                453B  6273 RT3D   DC    XL1'3D'
   453C 00                453C  6274         DC    XL1'00'
   453D 4549              453E  6275         DC    AL2(RT3E)
   453F 0C 01 3596 4AC2         6276         MVC   SPARUT(2),DEC3D
   4545 C0 87 3584              6277         B     SPAREX
                                6278 *
   4549 3E                4549  6279 RT3E   DC    XL1'3E'
   454A 00                454A  6280         DC    XL1'00'
   454B 4557              454C  6281         DC    AL2(RT3F)
   454D 0C 01 3596 4AC4         6282         MVC   SPARUT(2),DEC3E
   4553 C0 87 3584              6283         B     SPAREX
                                6284 *
                                6285 ************************************************************************
                                6286 * ROUTINE 3F. DEVICE POLLING                                         *
                                6287 *  POLL CMDS ARE ISSUED TO ALL DEVICES THAT MAY BE ATTATCHED.        *
                                6288 *                                  ---                                *
                                6289 *  UDT DEFINES THE NUMBER OF DRIVER/RECEIVER CARDS. EACH CARD        *
                                6290 *  HAS 3 DRIVER/RECEIVER CIRCUITS TO POLL THROUGH. THERE MAY         *
                                6291 *  OR MAY NOT BE A DEVICE ATTATCHED.                                 *
                                6292 *                                                                    *
                                6293 *  THE RESPONSE TO THE POLL IS NOT CHECKED.                          *
                                6294 ************************************************************************
   4557 3F                4557  6295 RT3F   DC    XL1'3F'             ROUT NO.
   4558 80                4558  6296         DC    XL1'80'             YES. MANUAL INTERVENTION(MAYBE)
   4559 4AC5              455A  6297         DC    AL2(RT40)
   455B C0 87 021A              6298         B     PRINT
   455F 01                455F  6299         DC    XL1'01'
   4560 2E                4560  6300         DC    IL1'46'
   4561 4594              4562  6301         DC    AL2(RT3FNA)
   4563 C0 87 4595              6302         B     RT3FGO
   4567 D9D6E4E340F3C 640 4594  6303 RT3FNA  DC    CL46'RCUT 3F DEVICE POLLING (SKIPPED IF SSW2 IS ON)'
   456F C4C5E5C9C3C54 0D7       6303
   4577 D6D3C3C9D5C74 0D         6303
   457F E2D2C9D7D7C5C 4A0       6303
   4587 C9C640E2E2E6F 240       6303
   458F C9E240D6D55D            6303
   4595 3C FF 4A76              6304 RT3FGO  MVI   POLLYE,X'FF'
   4599 0C 1E 4A75 4A76         6305         MVC   POLLYE-1(31),POLLYE
   459F 3C FF 4A96              6306         MVI   POLLNO,X'FF'
   45A3 0C 1E 4A95 4A96         6307         MVC   POLLNO-1(31),POLLNO
                                6308
                                6309 * POLL FIRST 3. (BASIC)
   45A9 3C 40 4A4E              6310         MVI   DEV3F,X'40'
   45AD 0C 01 4AA4 3028         6311         MVC   R3FMCS+13(2),HDB980     BIT 0.
   45B3 0C 01 4AA6 302C         6312         MVC   R3FMCS+15(2),LISELA     LINE SEL A.
   45B9 C0 87 49C6              6313         B     POLL3F                  GO POLL 40.
   45BD 3C C1 4A4E              6314         MVI   DEV3F,X'C1'
   45C1 0C 01 4AA4 3020         6315         MVC   R3FMCS+13(2),HDB940     BIT 1.
   45C7 C0 87 49C6              6316         B     POLL3F                  GO POLL C1.
   45CB 3C C2 4A4E              6317         MVI   DEV3F,X'C2'
   45CF 0C 01 4AA4 3024         6318         MVC   R3FMCS+13(2),HDB920     BIT 2
   45D5 C0 87 49C6              6319         B     POLL3F                  GO POLL C2
                                6320 * CHECK FOR TEX1 FEATURE.
                                6321 * POLL 3 IF PRESENT. C3,C4,C5
   45D9 38 08 0A0C              6322         TBN   UDT2,X'08'
   45DD C0 90 47B7              6323         BF    PRTABL
   45E1 3C C3 4A4E              6324         MVI   DEV3F,X'C3'
   45E5 0C 01 4AA4 3030         6325         MVC   R3FMCS+13(2),HDB910     BIT3
   45EB C0 87 49C6              6326         B     POLL3F                  GO POLL C3
   45EF 3C C4 4A4E              6327         MVI   DEV3F,X'C4'
   45F3 0C 01 4AA4 3032         6328         MVC   R3FMCS+13(2),HDB908     BIT-4
   45F9 C0 87 49C6              6329         B     POLL3F                  GO POLL C4
   45FD 3C C5 4A4E              6330         MVI   DEV3F,X'C5'
   4601 0C 01 4AA4 3034         6331         MVC   R3FMCS+13(2),HDB904     BIT 5
   4607 C0 87 49C6              6332         B     POLL3F                  GO POLL C5
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         6333 * CHECK FOR TEX 2 FEATURE.
                         6334 * POLL 3 IF PRESENT. C6.C7.C8
 460B 38 10 0A0C         6335         TBN   UDT2.X'10'
 460F C0 90 47B7         6336         BF    PRTABL
 4613 3C C6 4A4E         6337         MVI   DEV3F.X'C6'
 4617 0C 01 4AA6 303E    6338         MVC   R3FMCS+15(2).LISELB      LINE SELECT B
 461D 0C 01 4AA4 3036    6339         MVC   R3FMCS+13(2).HDB902      BIT 6
 4623 C0 87 49C6         6340         B     POLL3F                   GO POLL C6
 4627 3C C7 4A4E         6341         MVI   DEV3F.X'C7'
 462B 0C 01 4AA4 3038    6342         MVC   R3FMCS+13(2).HDB901      BIT 7
 4631 C0 87 49C6         6343         B     POLL3F                   GO POLL C7
 4635 3C C8 4A4E         6344         MVI   DEV3F.X'C8'
 4639 0C 01 4AA4 303A    6345         MVC   R3FMCS+13(2).HDB980      BIT 0
 463F C0 87 49C6         6346         B     POLL3F                   GO POLL C8
                         6347 * CHECK FOR TEX3 FEATURE
                         6348 * POLL C9.4A.4B IF PRESENT
 4643 38 20 0A0C         6349         TBN   UDT2.X'20'
 4647 C0 90 47B7         6350         BF    PRTABL
 464B 3C C9 4A4E         6351         MVI   DEV3F.X'C9'
 464F 0C 01 4AA4 303C    6352         MVC   R3FMCS+13(2).HDB940      BIT 1
 4655 C0 87 49C6         6353         B     POLL3F                   GO POLL C9
 4659 3C 4A 4A4E         6354         MVI   DEV3F.X'4A'
 465D 0C 01 4AA4 303E    6355         MVC   R3FMCS+13(2).HDB920      BIT 2
 4663 C0 87 49C6         6356         B     POLL3F                   GO POLL 4A
 4667 3C 4B 4A4E         6357         MVI   DEV3F.X'4B'
 466B 0C 01 4AA4 3030    6358         MVC   R3FMCS+13(2).HDB910      BIT 3
 4671 C0 87 49C6         6359         B     POLL3F                   GO POLL 4B
                         6360 * CHECK  FOR TEX4 FEATURE.
                         6361 * POLL 8C.4D.4E IF PRESENT.
 4675 38 40 0A0C         6362         TBN   UDT2.X'40'
 4679 C0 90 47B7         6363         BF    PRTABL
 467D 3C 4C 4A4E         6364         MVI   DEV3F.X'4C'
 4681 0C 01 4AA4 3032    6365         MVC   R3FMCS+13(2).HDB908      BIT 4
 4687 0C 01 4AA6 3040    6366         MVC   R3FMCS+15(2).LISELC      LINE SELECT C
 468D C0 87 49C6         6367         B     POLL3F                   GO POLL 4C.
 4691 3C 4D 4A4E         6368         MVI   DEV3F.X'4D'
 4695 0C 01 4AA4 3034    6369         MVC   R3FMCS+13(2).HDB904      BIT 5
 469B C0 87 49C6         6370         B     POLL3F
 469F 3C 4E 4A4E         6371         MVI   DEV3F.X'4E'
 46A3 0C 01 4AA4 3036    6372         MVC   R3FMCS+13(2).HDB902      BIT 6
 46A9 C0 87 49C6         6373         B     POLL3F                   GO POLL 4E
                         6374 * CHECK FOR TEX5 FEATURE
                         6375 * POLL 4F.50.D1 IF PRESENT
 46AD 38 80 0A0C         6376         TBN   UDT2.X'80'
 46B1 C0 90 47B7         6377         BF    PRTABL
 46B5 3C 4F 4A4E         6378         MVI   DEV3F.X'4F'
 46B9 0C 01 4AA4 3038    6379         MVC   R3FMCS+13(2).HDB901      BIT 7
 46BF C0 87 49C6         6380         B     POLL3F                   GO POLL 4F
 46C3 3C 50 4A4E         6381         MVI   DEV3F.X'50'
 46C7 0C 01 4AA4 303A    6382         MVC   R3FMCS+13(2).HDB980      BIT 0
 46CD C0 87 49C6         6383         B     POLL3F                   GO POLL 50
 46D1 3C D1 4A4E         6384         MVI   DEV3F.X'D1'
 46D5 0C 01 4AA4 303C    6385         MVC   R3FMCS+13(2),HDB940      BIT1
 46DB C0 87 49C6         6386         B     POLL3F                   GO POLL D1
                         6387 * CHECK FOR TEX6 FEATURE.
                         6388 * POLL D2.D3.D4 IF PRESENT.
 46DF 38 01 0A0B         6389         TBN   UDT2-1.X'01'
 46E3 C0 90 47B7         6390         BF    PRTABL
 46E7 3C D2 4A4E         6391         MVI   DEV3F.X'D2'
 46EB 0C 01 4AA4 303E    6392         MVC   R3FMCS+13(2).HDB920      BIT 2
 46F1 0C 01 4AA6 3042    6393         MVC   R3FMCS+15(2).LISELD      LINE SELECT D
 46F7 C0 87 49C6         6394         B     POLL3F                   GO POLL D2
 46FB 3C D3 4A4E         6395         MVI   DEV3F.X'D3'
 46FF 0C 01 4AA4 3030    6396         MVC   R3FMCS+13(2).HDB910      BIT 3
 4705 C0 87 49C6         6397         B     POLL3F                   GO POLL D3
 4709 3C D4 4A4E         6398         MVI   DEV3F.X'D4'
 470D 0C 01 4AA4 3032    6399         MVC   R3FMCS+13(2).HDB908      BIT 4
 4713 C0 87 49C6         6400         B     POLL3F                   GO POLL D4
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         6401 * CHECK FOR TEX7 FEATURE.
                         6402 * POLL D5.D6.D7 IF PRESENT.
 4717 38 02 0A0B         6403         TBN   UDT2-1,X'02'
 4718 C0 90 47B7         6404         BF    PRTABL
 471F 3C D5 4A4E         6405         MVI   DEV3F,X'D5'
 4723 0C 01 4AA4 3034    6406         MVC   R3FMCS+13(2),HDB904      BIT 5
 4729 C0 87 49C6         6407         B     POLL3F                   GO POLL D5
 472D 3C D6 4A4E         6408         MVI   DEV3F,X'D6'
 4731 0C 01 4AA4 3036    6409         MVC   R3FMCS+13(2),HDB902      BIT 6
 4737 C0 87 49C6         6410         B     POLL3F                   GO POLL D6
 473B 3C D7 4A4E         6411         MVI   DEV3F,X'D7'
 473F 0C 01 4AA4 3038    6412         MVC   R3FMCS+13(2),HDB901      BIT 7
 4745 C0 87 49C6         6413         B     POLL3F                   GO POLL D7
                         6414 * CHECK FOR TEX8 FEATURE.
                         6415 * POLL D8.D9.5A IF PRESENT.
 4749 38 04 0A0B         6416         TBN   UDT2-1,X'04'
 474D C0 90 47B7         6417         BF    PRTABL
 4751 3C D8 4A4E         6418         MVI   DEV3F,X'D8'
 4755 0C 01 4AA4 303A    6419         MVC   R3FMCS+13(2),HDB980      BIT 0
 475B 0C 01 4AA6 3044    6420         MVC   R3FMCS+15(2),LISELE      LINE SELECT E
 4761 C0 87 49C6         6421         B     POLL3F                   GO POLL D8
 4765 3C D9 4A4E         6422         MVI   DEV3F,X'D9'
 4769 0C 01 4AA4 303C    6423         MVC   R3FMCS+13(2),HDB940      BIT 1
 476F C0 87 49C6         6424         B     POLL3F                   GO POLL D9
 4773 3C 5A 4A4E         6425         MVI   DEV3F,X'5A'
 4777 0C 01 4AA4 303E    6426         MVC   R3FMCS+13(2),HDB920      BIT 2
 477D C0 87 49C6         6427         B     POLL3F                   GO POLL 5A
                         6428 * CHECK FOR TEX9 FEATURE.
                         6429 * POLL 5B.5C.5D IF PRESENT.
 4781 38 08 0A0B         6430         TBN   UDT2-1.X'08'
 4785 C0 90 47B7         6431         BF    PRTABL
 4789 3C 5B 4A4E         6432         MVI   DEV3F,X'5B'
 478D 0C 01 4AA4 3030    6433         MVC   R3FMCS+13(2),HDB910      BIT 3
 4793 C0 87 49C6         6434         B     POLL3F                   GO POLL 5B
 4797 3C 5C 4A4E         6435         MVI   DEV3F,X'5C'
 479B 0C 01 4AA4 3032    6436         MVC   R3FMCS+13(2),HDB908      BIT 4
 47A1 C0 87 49C6         6437         B     POLL3F                   GO POLL 5C
 47A5 3C 5D 4A4E         6438         MVI   DEV3F,X'5D'
 47A9 0C 01 4AA4 3034    6439         MVC   R3FMCS+13(2),HDB904      BIT 5
 47AF C0 87 49C6         6440         B     POLL3F                   GO POLL 5D
 47B3 C0 87 47B7         6441         B     PRTABL
                         6442
 47B7 C0 87 021A         6443 PRTABL  B     PRINT
 47BB 02                 47BB 6444    DC    XL1'02'
 47BC 42                 47BC 6445    DC    IL1'66'
 47BD 48CC               47BE 6446    DC    AL2(R3FM01)
 47BF 0C 01 47C8 4A52    6447         MVC   CKFFY+3(2),POLYA
 47C5 3D FF 0000         6448 CKFFY   CLI   *-*,X'FF'
 47C9 C0 81 4802         6449         BE    EMPTYE                   BR IF NO ENTRY
 47CD 0C 01 47D6 4A52    6450         MVC   CKFFY1+3(2),POLYA
 47D3 3D FF 0000         6451 CKFFY1  CLI   *-*,X'FF'
 47D7 C0 81 480A         6452         BE    ENDYES
 47DB 0C 01 47E6 47D6    6453         MVC   SETDA1+5(2),CKFFY1+3
 47E1 0C 00 4A4E 00C0    6454 SETDA1  MVC   DEV3F(1),*-*
 47E7 C0 87 021E         6455         B     UNPACK
 47EB 01                 47EB 6456    DC    XL1'01'
 47EC 4A4E               47ED 6457    DC    AL2(DEV3F)
 47EE 48DD               47EF 6458    DC    AL2(R3FM02)
 47F0 C0 87 021A         6459         B     PRINT
 47F4 01                 47F4 6460    DC    XL1'01'
 47F5 11                 47F5 6461    DC    IL1'17'
 47F6 48DD               47F7 6462    DC    AL2(R3FM02)
 47F8 0E 01 47D6 56D9    6463         ALC   CKFFY1+3(2),X0001        INC ADDR
 47FE C0 87 47D3         6464         B     CKFFY1
                         6465
 4802 C0 87 021A         6466 EMPTYE  B     PRINT                    PRINT 'NONE'
 4806 03                 4806 6467    DC    XL1'03'
 4807 04                 4807 6468    DC    IL1'04'
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8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   4808 49BB             4809 6469          DC    AL2(R3FM06)
                              6470
   480A C0 87 021A            6471 ENDYES B      PRINT
   480E 92               480E 6472          DC    XL1'92'
   480F 0C 01 4818 4A50       6473          MVC   CKFFN+3(2),POLNA
   4815 3D FF 0000            6474 CKFFN    CLI   *-*,X'FF'
   4819 C0 81 4887            6475          BE    END3F
   481D C0 87 021A            6476          B     PRINT
   4821 02               4821 6477          DC    XL1'02'
   4822 58               4822 6478          DC    IL1'88'
   4823 4935             4824 6479          DC    AL2(R3FM03)
   4825 0C 01 482E 4A50       6480          MVC   CKFFN1+3(2),POLNA
   4828 3D FF 0000            6481 CKFFN1   CLI   *-*,X'FF'
   482F C0 81 485A            6482          BE    ENDNO
   4833 0C 01 483E 482E       6483          MVC   SETDA2+5(2),CKFFN1+3
   4839 0C 00 4A4E 00CC       6484 SETDA2   MVC   DEV3F(1),*-*
   483F C0 87 021E            6485          B     UNPACK
   4843 01               4843 6486          DC    XL1'01'
   4844 4A4E             4845 6487          DC    AL2(DEV3F)
   4846 48DD             4847 6488          DC    AL2(R3FM02)
   4848 C0 87 021A            6489          B     PRINT
   484C 01               484C 6490          DC    XL1'01'
   484D 11               484D 6491          DC    IL1'17'
   484E 48DD             484F 6492          DC    AL2(R3FM02)
   4850 0E 01 482E 56E9       6493          ALC   CKFFN1+3(2),X0001        INC ADDR
   4856 C0 87 482B            6494          B     CKFFN1
                              6495
   485A C0 87 021A            6496 ENDNO    B     PRINT
   485E 92               485E 6497          DC    XL1'92'
   485F C0 87 021A            6498          B     PRINT
   4863 01               4863 6499          DC    XL1'01'
   4864 65               4864 6500          DC    IL1'101'
   4865 499A             4866 6501          DC    AL2(R3FM04)
   4867 C0 87 021A            6502          B     PRINT
   486B 02               486B 6503          DC    XL1'02'
   486C 1D               486C 6504          DC    IL1'29'
   486D 49B7             486E 6505          DC    AL2(R3FM05)
   486F 3C 5E 65F2            6506          MVI   ERRHLT,X'5E'
   4873 3C 3F 65F1            6507          MVI   ERRRTN,X'3F'
   4877 0C 09 6601 49C5       6508          MVC   ERRLOG(10),POLLNR
   487D C0 87 63FE            6509          B     ELPO
   4881 C0 87 0222            6510          B     HALT
   4885 015E             4886 6511          DC    XL2'015E'
   4887 C0 87 0216            6512 END3F    B     LINK
   488B E3C8C540C6D6D3D3 48A2 6513          DC    CL24'THE FOLLOWING RESPONDED '
   4893 D6E6C9D5C740D5C5      6513
   489B E2D7D6D5C4C5C440      6513
   48A3 E3D640C140D7D6D3 48CC 6514 R3FM01   DC    CL42'TO A POLL. (THE RESPONSE WAS NOT CHECKED.)'
   48AB D34B404DE3C8CE40      6514
   48B3 D9C5E2D7D6D5E4C5      6514
   48BB 40E6C1E240D5D4E3      6514
   48C3 40C3C8C5C3D2C6C4      6514
   48CB 485D                  6514
   48CD C4C5E5C9C3C540CC 48DD 6515 R3FM02   DC    CL17'DEVICE ADDRESS XX'
   48D5 C4C4D9C5E2E24EE7      6515
   48DD E7                    6515
   48DE E3C8C540C6D6D3D3 48F6 6516          DC    CL25'THE FOLLOWING HAVE A COAX'
   48E6 D6E6C9D5C740C4C1      6516
   48EE E5C540C140C3D6C1      6516
   48F6 E7                    6516
   48F7 407DD7D6D9E37E40 4922 6517          DC    CL44' ''PORT'' AVAILABLE (AS PER UDT) BUT GIVE NO'
   48FF C1E5C1C9D3C1C2D3      6517
   4907 C5404DC1E240D7C5      6517
   490F D940E4C4E35D4CC2      6517
   4917 E4E340C7C9E5CE40      6517
   491F D5D64040              6517
   4923 40D9C5E2D7D6D5E2 4935 6518 R3FM03   DC    CL19' RESPONSE TO A POLL'
   492B C540E3D640C14CD7      6518
```


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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   4933 D6D3D3                6518
   4936 C9C640C4C5E5C5C3 495D 6519          DC    CL40'IF DEVICE IS CONNECTED AND HAS POWER ON.'
   493E C540C9E240C3D6D5      6519
   4946 D5C5C3E3C5C44CC1      6519
   494E D5C440C8C1E24CD7      6519
   4956 D6E6C5D940D6D5E8      6519
   495E E2E4E2D7C5C3E340 4985 6520          DC    CL40'SUSPECT COAX AND DEVICE WHILE CONTINUING'
   4966 C3D6C1E740C1D5C4      6520
   496E 40C4C5E5C9C3C540      6520
   4976 E6C8C9D3C540C3D6      6520
   497E D5E3C9D5E4C9D5C7      6520
   4986 40C9D540C1E3E3C1 499A 6521 R3FM04   DC    CL21' IN ATTATCHMENT MAPS.'
   498E E3C3C8C4C5D5E340      6521
   4996 D4C1D7E24B            6521
   499B C9C640D5D6E34CC3 49B7 6522 R3FM05   DC    CL29'IF NOT CONNECTED, RESET HALT.'
   49A3 D6D5D5C5C3E3C5C4      6522
   49AB 6B40D9C5E2C5E340      6522
   49B3 C8C1D3E34B            6522
   49B8 D5D6D5C5         49BB 6523 R3FM06   DC    CL4'NONE'
   49BC D5D640C1D5E2E4C5 49C5 6524 POLLNR DC    CL10'NO ANSWER '
   49C4 D940                  6524
                              6525 ************************************************
                              6526 * POLLING SUBROUTINE FOR ROUTINE 3F.          *
                              6527 *  THE MICROCODE HAS ALRGADY BEEN TAILORED     *
                              6528 *  TO SELECT ONE DRIVER/RECEIVER CIRCUIT.      *
                              6529 *  LOAD MICROCODE                              *
                              6530 *  DO MICROCODE                                *
                              6531 *  IF POLL SUCCESSFUL, ADD DEV ADDR TO 'POLL-YES' LIST.*
                              6532 *  IF POLL FAILED THEN ADD DEV ADDR TO 'POLL-NO' LIST. *
                              6533 ************************************************
   49C6 34 08 4A4D            6534 POLL3F   ST    P03FEX+3,ARR
   49CA 38 02 020D            6535          TBN   SBYTE5,SSW2E
   49CE C0 90 49D8            6536          BF    TESTEQ
   49D2 C0 87 0222            6537          B     HALT
   49D6 01FE             49D7 6538          DC    XL2'01FE'                  MFG TEST HLT
   49D8 C0 87 5918            6539 TESTEQ   B     LOADCS
   49DC 83                    6540          DC      XL1'83'                  DISABLE/RST
   49DD 4A97                  6541          DC      AL2(R3FMCS)              ENABLE
   49DF 4AC0                  6542          DC      AL2(R3FMCE)              WAIT
   49E1 F3 58 80              6543          SIO   X'80',SIOI                 DISABLE/RST
   49E4 F3 58 E0              6544          SIO   X'E0',SIOI                 HDB08.09
   49E7 0D FF 49C6 49C6       6545          CLC   POLL3F(256),POLL3F         09=FF?
   49ED F3 58 80              6546          SIO   X'80',SIOI                 BR IF SO
   49F0 30 4C 4A56            6547          SNS   ACTR3F,HDB4
   49F4 0D 00 4A56 4A54       6548          CLC   ACTR3F(1),EXPR3F           NEXT ENTRY?
   49FA C0 81 4A26            6549          BE    ADDYES                     BR IF SO
   49FE 0C 01 4A07 4A50       6550 ADDNO    MVC   TABCK1+3(2),POLNA          INC ADDR
   4A04 3D FF 0000            6551 TABCK1   CLI   *-*,X'FF'
   4A08 C0 81 4A16            6552          BE    TABENT                     PUT DEV ADR IN 'NO' TABLE
   4A0C 0E 01 4A07 56E9       6553          ALC   TABCK1+3(2),X0001
   4A12 C0 87 4A04            6554          B     TABCK1
   4A16 0C 01 4A1F 4AC7       6555 TABENT   MVC   TABDO+3(2),TABCK1+3
   4A1C 0C 00 0000 4A4E       6556 TABDO    MVC   *-*(1),DEV3F               NEXT ENTRY?
   4A22 C0 87 4A4A            6557          B     P03FEX                     BR IF SO
                              6558                                           INC ADDR
   4A26 0C 01 4A2F 4A52       6559 ADDYES   MVC   TABCK2+3(2),POLYA
   4A2C 3D FF 0000            6560 TABCK2   CLI   *-*,X'FF'                  PUT DEV ADDR IN 'YES' TABLE
   4A30 C0 81 4A3E            6561          BE    TABNXT                     RETURN
   4A34 0E 01 4A2F 56E9       6562          ALC   TABCK2+3(2),X0001          ADDR OF DEVICE UNDER TEST
   4A3A C0 87 4A2C            6563          B     TABCK2                     ADDR OF 1ST POS OF NO TABLE
   4A3E 0C 01 4A47 4ACF       6564 TABNXT   MVC   TABDOA+3(2),TABCK2+3       ADDR OF 1ST POS OF YES TABLE
   4A44 0C 00 0000 4A4E       6565 TABDOA   MVC   *-*(1),DEV3F               EXP. RESULTS
   4A4A C0 87 4A4A            6566 P03FEX   B     *                          ACT RESULTS
   4A4E 00                    6567 DEV3F    DC    XL1'00'
   4A4F 4A57                  6568 POLNA    DC    AL2(POLLYE-31)
   4A51 4A77                  6569 POLYA    DC    AL2(POLLNO-31)
   4A53 00FF                  6570 EXPR3F DC      XL2'00FF'
   4A55 0000                  6571 ACTR3F DC      XL2'0000'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    4A57 4040404040404040 4A76 6572 POLLYE   DC    32CL1' '
    4A5F 4040404040404040      6572
    4A67 4040404040404040      6572
    4A6F 4040404040404040      6572
    4A77 4040404040404040 4A96 6573 POLLNO   DC    32CL1' '
    4A7F 4040404040404040      6573
    4A87 4040404040404040      6573
    4A8F 4040404040404040      6573
                               6574 *********************************
                               6575 * START OF MICROPROGRAM LISTING *
                               6576 *********************************
                          4A97 6577 R3FMCS   EQU   *
    4A97 7900             4A98 6578          DC    XL2'79C0'    000  IC HDB9='00'
    4A99 0A89             4A9A 6579          DC    XL2'0A89'    001  LE LINE SEL A. DESELECT ALL
    4A9B 0B89             4A9C 6580          DC    XL2'0B89'    002  LE LINE SEL B. DESELECT ALL
    4A9D 0C89             4A9E 6581          DC    XL2'0C89'    003  LE LINE SEL C. DESELECT ALL
    4A9F CD89             4AA0 6582          DC    XL2'0D89'    004  LE LINE SEL D. DESELECT ALL
    4AA1 0E89             4AA2 6583          DC    XL2'0E89'    005  LE LINE SEL E. DESELECT ALL
    4AA3 0000             4AA4 6584          DC    XL2'0000'    006  IC HDB9=XX. LOADED BY USER.
    4AA5 0000             4AA6 6585          DC    XL2'0000'    007  LE LINE SEL X.FROM HDB9. USER LOADED.
    4AA7 7182             4AA8 6586          DC    XL2'7182'    008  IC,1,X'82' SET HDB 1 FOR POLL WORD
    4AA9 1508             4AAA 6587          DC    XL2'1508'    009  SSF,5      RESET RECEIVE CHECK
    4AAB 1008             4AAC 6588          DC    XL2'1008'    00A  SSF,0      RESET I/O REG 2,3,13
    4AAD 1204             4AAE 6589          DC    XL2'1204'    00B  SSN,2      SET I/O REG BIT 2
    4AAF 1004             4AB0 6590          DC    XL2'1004'    00C  SSN,0      SET TRANSMIT ZERO'S
    4AB1 0781             4AB2 6591          DC    XL2'0781'    00D  LE TO I/O REG TO XMIT ZERO'S
    4AB3 400E             4AB4 6592          DC    XL2'400E'    00E  TSN,0      WAIT FOR XMIT WD RDY TO FALL
    4AB5 0781             4AB6 6593          DC    XL2'0781'    00F  LE TO I/O REG TO XMIT POLL WORD
    4AB7 4010             4AB8 6594          DC    XL2'4010'    010  TSN,0      WAIT FOR XMIT WD RDY TO FALL
    4AB9 4113             4ABA 6595          DC    XL2'4113'    011  TSN,1      WAIT FOR RECEIVE WORD ROY
    4ABB 5011             4ABC 6596          DC    XL2'5011'    012  BOS,0      TO ADDR 011. DEEP WAITING.
    4ABD 79FF             4ABE 6597          DC    XL2'79FF'    013  IC         HDB9='FF'=SUCCESS
    4ABF 5014             4AC0 6598 R3FMCE   DC    XL2'5014'    014  BOS,0      END. HANG
                               6599 *
    4AC1 F3C4             4AC2 6600 DEC3D    DC    CL2'3D'
    4AC3 F3C5             4AC4 6601 DEC3E    DC    CL2'3E'
                               6602
                               6602
                               6603 ********************************************************************************
                               6604 * ROUTINE 40     SKIPPED IF SSW2 IS ON.                                        *
                               6605 *                                                                              *
                               6606 * THIS ROUTINE WILL DO VARIOUS TESTS THAT REQUIRE MANUAL INTERVENTION          *
                               6607 * TO TEST THINGS SUCH AS THE I/O CHECK LIGHT, THE I/O ATTENTION LIGHT,         *
                               6608 * INVALID OPS THAT CAUSE PROC CHECKS, ETC.                                     *
                               6609 *                                                                              *
                               6610 ********************************************************************************
    4AC5 40               4AC5 6611 RT40     DC    XL1'40'                        ROUTINE NO.
    4AC6 00               4AC6 6612          DC    XL1'00'
    4AC7 4EF2             4AC8 6613          DC    AL2(RT41)
    4AC9 3D 00 65F3              6614          CLI   IPLFLG,0                       *** REMOVE FOR RELEASE ***
    4ACD C0 81 4D28              6615          BE    R2AEXT                         *** REMOVE FOR RELEASE ***
    4AD1 C0 87 021A              6616          B     PRINT                          PRINT ROUTINE HEADER
    4AD5 01               4AD5 6617          DC    XL1'01'
    4AD6 2B               4AD6 6618          DC    IL1'43'
    4AD7 4B07             4AD8 6619          DC    AL2(R4CHDR)
    4AD9 C0 87 4B08              6620          B     R4CGO
    4ADD D9D6E4E340F4F040 4B07 6621 R4CHDR DC    CL43'ROUT 40 MANUAL INTERV. (SKIPPED IF SSW2 ON)'
    4AE5 C4C1D5E4C1D340C9        6621
    4AED D5E3C5D9E54B4040        6621
    4AF5 E2D2C9D7C5C44040        6621
    4AFD C9C640E2E2E6F240        6621
    4B05 D6D55D                  6621
    4B08 38 20 0208              6622 R4CGO  TBN   SBYTE0,X'20'               IS SSW 02 ON?
    4B0C C0 10 4D37              6623        BT    LNKTER                     TERMINATE IF SO
    4B10 C0 87 021A              6624        B PRINT                          PRINT INSTRUCTIONS
    4B14 81               4B14 6625          DC    XL1'81'
    4B15 67               4B15 6626          DC    IL1'103'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    4B16 4DA4             4B17 6627          DC    AL2(NTFM1)
    4B18 C0 87 021A              6628          B     PRINT
    4B1C 86                      6629          DC    XL1'86'
    4B1D 21                      6630          DC    IL1'33'
    4B1F 4DC5                    6631          DC    AL2(NTFM2)
                                 6632
    4B20 F3 58 84                6633 IOCHKN SIO     X'84',SIOI                   .DISABLE & TURN ON DIAG #2
    4B23 31 4A 0D56              6634        LIO     XAA55,HDB2                   .LOAD BAD PARITY IN HDB'S
    4B27 F3 58 80                6635        SIO     X'80',SIOI                   .DISABLE & RESET DIAG #2
    4B2A 30 4A 5FE6              6636        SNS     STATAC,HCB2                  .CAUSE ATTACHMENT CHECK
                                 6637
    4B2E C0 87 021A              6638        B       PRINT                        IS I/O CHECK ON?
    4B32 86                      6639        DC      XL1'86'
    4B33 1A                      6640        DC      IL1'26'
    4B34 4DDF                    6641        DC      AL2(NTFM3)
    4B36 C0 87 0222              6642        B       HALT
    4B3A 14FF                    6643        DC      XL2'14FF'
                                 6644
    4B3C 30 00 5FE6              6645        SNS     STATAC,X'00'                 .READ THE CONSOLE SWITCHES
    4B40 39 0F 5FE6              6646        TBF     STATAC,X'0F'                 .TEST FOR ANSWER 'NO'
    4B44 F2 90 0E                6647        JF      IOCHK0                       .JUMP IF ANSWER WAS 'YES'
    4B47 0C 09 6601 4EC0         6648        MVC     ERRLOG(10),NTFE1             .ERROR, MOVE IN LOG MSG.
    4B4D 3C 98 4D2A              6649        MVI     NTFHLT,X'98'                 .INSERT HALT CODE   -98-
    4B51 C0 87 4D02              6650        B       NTFLOG                       .GO LOG ERROR
                                 6651
    4B55 31 4A 0D62              6652 IOCHK0 LIO     ZERO,HDB2                    .RESTORE GOOD PARITY IN HDB'S
    4B59 C0 87 021A              6653        B       PRINT                        DEPRESS CHECK RESET
    4B5D 86                      6654        DC      XL1'86'
    4B5E 25                      6655        DC      IL1'37'
    4B5F 4E04                    6656        DC      AL2(NTFM4)
    4B61 C0 87 0222              6657        B       HALT
    4B65 14FF                    6658        DC      XL2'14FF'
                                 6659
    4B67 C0 87 021A              6660        B       PRINT
    4B6B 86                      6661        DC      XL1'86'                      IS I/O CHECK OFF?
    4B6C 1B                      6662        DC      IL1'27'
    4B6D 4E1F                    6663        DC      AL2(NTFM5)
    4B6F C0 87 0222              6664        B       HALT
    4B73 14FF                    6665        DC      XL2'14FF'
                                 6666
    4B75 30 00 5FE6              6667        SNS     STATAC,X'00'                 .READ CONSOLE SWITCHES
    4B79 39 0F 5FE6              6668        TBF     STATAC,X'0F'                 .TEST FOR ANSWER 'NO'
    4B7D F2 90 0E                6669        JF      TPC1                         .JUMP IF ANSWER YES
    4B80 0C 09 6601 4EC0         6670        MVC     ERRLOG(10),NTFE1             .ERROR, SET LOG MESSAGE
    4B86 3C 9A 4D2A              6671        MVI     NTFHLT,X'9A'                 SE UP HALT CODE   -9A-
    4B8A C0 87 4D02              6672        B       NTFLOG                       .GO LOG THE ERROR
                                 6673
    4B8E 0C 02 4E88 4EE7         6674 TPC1   MVC     NTFM8-1(3),NTFSIO            .CORRECT MESSAGE
    4B94 C0 87 021A              6675        B       PRINT                        PRINT INSTR.
    4B98 81                      6676        DC      XL1'81'
    4B99 39                      6677        DC      IL1'57'
    4B9A 4E89                    6678        DC      AL2(NTFM8)
    4B9C C0 87 021A              6679        B       PRINT
    4BA0 86                      6680        DC      XL1'86'
    4BA1 31                      6681        DC      IL1'49'
    4BA2 4E50                    6682        DC      AL2(NTFM7)
    4BA4 C0 87 0222              6683        B       HALT
    4BA8 14FF             4BA9 6684          DC      XL2'14FF'
                                 6685
    4BAA 3C 41 4EF1              6686        MVI     RENTRY,X'41'                 .SET UP FOR NEXT RENTRY
    4BAE F3 5C 80                6687        SIO     X'80',FETADR                 .INVALID SIO SHOULD PC
    4BB1 C0 87 4CF8              6688        B       NOPC                         .BRANCH IF NO PC OCCURED
                                 6689
    4BB5 3C 40 0A03              6690 NTFRST MVI     PRTN,X'40'                   .FORCE ROUTINE BACK TO 40
    4BB9 38 40 4EF1              6691        TBN     RENTRY,X'40'                 .TEST FOR 1ST RENTRY
    4BBD F2 90 28                6692        JF      RENT3                        .JUMP IF NOT
    4BC0 0C 02 4E88 4EEA         6693        MVC     NTFM8-1(3),NTFSNS            .CORRECT MESSAGE
    4BC6 C0 87 021A              6694        B       PRINT                        PRINT INSTR.
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   4BCA 81               4BCA 6695         DC    XL1'81'
   4BCB 39               4BCB 6696         DC    IL1'57'
   4BCC 4E89             4BCD 6697         DC    AL2(NTFM8)
   4BCE C0 87 021A             6698         B     PRINT
   4BD2 86               4BD2 6699         DC    XL1'86'
   4BD3 31               4BD3 6700         DC    IL1'49'
   4BD4 4E50             4BD5 6701         DC    AL2(NTFM7)
   4BD6 C0 87 0222             6702         B     HALT
   4BDA 14FF             4BDB 6703         DC    XL2'14FF'
                               6704
   4BDC 3C 21 4EF1             6705         MVI   RENTRY,X'21'      .SET UP FOR 2ND RENTRY
   4BE0 30 5C 5FE6             6706         SNS   STATAC,FETADR     .INVALID SENSE SHOULD PC
   4BE4 C0 87 4CF8             6707         B     NOPC              .BRANCH IF NO PC OCCURRED
                               6708
   4BE8 38 20 4EF1             6709 RENT3   TBN   RENTRY,X'20'       .TEST FOR 2ND RENTRY
   4BEC F2 90 28               6710         JF    RENT4A            .IF NOT TERMINATE PROG.
   4BEF 0C 02 4E88 4E ED       6711         MVC   NTFM8-1(3),NTFLIO .CORRECT MESSAGE
   4BF5 C0 87 021A             6712         B     PRINT             PRINT INSTR.
   4BF9 81               4BF9 6713         DC    XL1'81'
   4BFA 39               4BFA 6714         DC    IL1'57'
   4BFB 4E89             4BFC 6715         DC    AL2(NTFM8)
   4BFD C0 87 021A             6716         B     PRINT
   4C01 86               4C01 6717         DC    XL1'86'
   4C02 31               4C02 6718         DC    IL1'49'
   4C03 4E50             4C04 6719         DC    AL2(NTFM7)
   4C05 C0 87 0222             6720         B     HALT
   4C09 14FF             4C0A 6721         DC    XL2'14FF'
                               6722
   4C0B 3C 91 4EF1             6723         MVI   RENTRY,X'91'      /SET UP FOR 4TH RENTRY
   4C0F 31 5F 5FE6             6724         LIO   STATAC,BUSY       .INVALID LIO SHOULD PC
                               6725
   4C13 C0 87 4CF8             6726         B     NOPC
   4C17 3D 90 4EF1             6727 RENT4A  CLI   RENTRY,X'90'       .REENTRY AFTER INV. LIO?
   4C1B F2 01 28               6728         JNE   RENT4
   4C1E 0C 02 4E88 4E F0       6729         MVC   NTFM8-1(3),NTFTIO .CORRECT MESSAGE
   4C24 C0 87 021A             6730         B     PRINT
   4C28 81               4C28 6731         DC    XL1'81'
   4C29 39               4C29 6732         DC    IL1'57'
   4C2A 4E89             4C2B 6733         DC    AL2(NTFM8)
   4C2C C0 87 021A             6734         B     PRINT
   4C30 86               4C30 6735         DC    XL1'86'
   4C31 31               4C31 6736         DC    IL1'49'
   4C32 4E50             4C33 6737         DC    AL2(NTFM7)
   4C34 C0 87 0222             6738         B     HALT
   4C38 14FF             4C39 6739         DC    XL2'14FF'
   4C3A 3C 11 4EF1             6740         MVI   RENTRY,X'11'
                               6741
   4C3E C1 8F 4C42             6742         TIO   BADTIO,X'8F'      .INVALID TIC SHOULD CAUSE P.C.
   4C42 C0 87 4CF8             6743 BADTIO  B     NOPC              .ERROR. NO P.C.
   4C46 3D 10 4EF1             6744 RENT4   CLI   RENTRY,X'10'       REENTRY AFTER INV. LIO?
   4C4A C0 01 4C73             6745         BNE   RENT5             BR IF NOT
   4C4E 3C F1 4EC5             6746         MVI   NTFM9-1,X'F1'     SET MSG FOR INVALID SEQUENCE 1
   4C52 C0 87 021A             6747         B     PRINT
   4C56 81               4C56 6748         DC    XL1'81'
   4C57 3D               4C57 6749         DC    IL1'61'
   4C58 4EC6             4C59 6750         DC    AL2(NTFM9)
   4C5A C0 87 021A             6751         B     PRINT
   4C5E 86               4C5E 6752         DC    XL1'86'
   4C5F 31               4C5F 6753         DC    IL1'49'
   4C60 4E50             4C61 6754         DC    AL2(NTFM7)
   4C62 C0 87 0222             6755         B     HALT
   4C66 14FF             4C67 6756         DC    XL2'14FF'
                               6757 * ISSUE BSCA SIO WITH ATTACH DISABLED
   4C68 3C 81 4EF1             6758         MVI   RENTRY,X'81'      SET UP FOR RETRY AFTER FIRST.
   4C6C F3 8A 00               6759         SIO   X'00',X'8A'       INVALID COMMAND SEQ.ISSUE SIO
                               6760 *                               WITH BSCA DISABLED.
                               6761
   4C6F C0 87 4CEA             6762         B     NOHANG
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               6763
   4C73 3D 80 4EF1             6764 RENT5   CLI   RENTRY,X'80'       RENTRY AFTER INV.SEQ 1 ?
   4C77 C0 01 4CAE             6765         BNE   RENT6               BR IF NOT
   4C7B 3C F2 4EC5             6766         MVI   NTFM9-1,X'F2'       SET MSG FOR INV SEQ. 2.
   4C7F C0 87 021A             6767         B     PRINT
   4C83 81               4C83 6768         DC    XL1'81'
   4C84 3D               4C84 6769         DC    IL1'61'
   4C85 4EC6             4C86 6770         DC    AL2(NTFM9)
   4C87 C0 87 021A             6771         B     PRINT
   4C8B 86               4C8B 6772         DC    XL1'86'
   4C8C 31               4C8C 6773         DC    IL1'49'
   4C8D 4E50             4C8E 6774         DC    AL2(NTFM7)
   4C8F C0 87 0222             6775         B     HALT
   4C93 14FF             4C94 6776         DC    XL2'14FF'
                               6777 * MAKE BSCA/3271 EMUL BUSY AND THEN ISSUE SIO.
   4C95 C0 87 5918             6778         B     LOADCS
   4C99 01               4C99 6779         DC    XL1'01'
   4C9A F3 58 E0               6780         SIO   X'E0',SIOI          ENABLE ATTACH&NC
   4C9D F3 88 C0               6781         SIO   X'C0',X'88'         ENABLE BSCA
   4CA0 F3 8A C4               6782         SIO   X'C4',X'8A'         MAKE BSCA BUSY
   4CA3 3C 83 4EF1             6783         MVI   RENTRY,X'83'
   4CA7 F3 8A C4               6784         SIO   X'C4',X'8A'         TO BUSY ATTACH.SHOULD HANG
   4CAA C0 87 4CEA             6785         B     NOHANG
                               6786
   4CAE 3D 82 4EF1             6787 RENT6   CLI   RENTRY,X'82'       RENTRY AFTER INV SEQ 2?
   4CB2 C0 01 4D28             6788         BNE   R2AEXT              BR IF NOT
   4CB6 3C F3 4EC5             6789         MVI   NTFM9-1,X'F3'       SET MSG FOR INV SEQ.3
   4CBA C0 87 021A             6790         B     PRINT
   4CBE 81               4CBE 6791         DC    XL1'81'
   4CBF 3D               4CBF 6792         DC    IL1'61'
   4CC0 4EC6             4CC1 6793         DC    AL2(NTFM9)
   4CC2 C0 87 021A             6794         B     PRINT
   4CC6 86               4CC6 6795         DC    XL1'86'
   4CC7 31               4CC7 6796         DC    IL1'49'
   4CC8 4E50             4CC9 6797         DC    AL2(NTFM7)
   4CCA C0 87 0222             6798         B     HALT
   4CCE 14FF             4CCF 6799         DC    XL2'14FF'
                               6800 * MAKE BSCA/3271EMUL BUSY&ISSUE LIO.SHOULD HANG
   4CD0 C0 87 5918             6801         B     LOADCS
   4CD4 01               4CD4 6802         DC    XL1'01'
   4CD5 F3 58 E0               6803         SIO   X'E0',SIOI          ENABLE ATTACH&NC
   4CD8 F3 88 C0               6804         SIO   X'C0',X'88'         ENABLE BSCA
   4CDB F3 8A C4               6805         SIO   X'C4',X'8A'         MAKE BSAC BUSY
   4CDE 3C 87 4EF1             6806         MVI   RENTRY,X'87'
   4CE2 31 8C 3BBC             6807         LIO   BCYSTL,BSDAR        LIOWITH BSCA BUSY.SHOULD HANG
   4CE6 C0 87 4CEA             6808         B     NOHANG
                               6809
   4CEA 0C 09 6601 4ECA        6810 NOHANG  MVC   ERRLOG(10),NTFE2     MOVE IN LOG MSG
   4CF0 3C 9F 4D2A             6811         MVI   NTFHLT,X'9F'        MOVE IN HALT CODE
   4CF4 C0 87 4D02             6812         B     NTFLOG
                               6813
   4CF8 0C 09 6601 4EE4        6814 NOPC    MVC   ERRLOG(10),NTFE4     .MOVE IN LOG MSG.
   4CFE 3C 9E 4D2A             6815         MVI   NTFHLT,X'9E'        .MOVE IN HALT CODE  -9E-
                               6816
   4D02 0C 00 65F2 4D2A        6817 NTFLOG  MVC   ERRHLT(1),NTFHLT     .MOVE HALT TO LOG OUT
   4D08 3C 40 65F1             6818         MVI   ERRRTN,X'40'        .MOVE IN ROUTINE
   4D0C 0C 00 4D18 65F2        6819         MVC   NTFIDE(1),ERRHLT
   4D12 C0 87 021A             6820         B     PRINT
   4D16 C1               4D16 6821         DC    XL1'C1'
   4D17 0A               4D17 6822         DC    IL1'10'
   4D18 6601             4D19 6823         DC    AL2(ERRLOG)
   4D1A 1400             4D1B 6824 NTFIDE DC    XL2'1400'
   4D1C C0 87 63FE             6825         B     ELPO              .GO PRINT OUT LOG
   4D20 C0 87 021A             6826         B     PRINT             .SPACE 6
   4D24 96               4D24 6827         DC    XL1'96'
   4D25 C0 87 0222             6828         B     HALT
   4D29 1400             4D2A 6829 NTFHLT DC    XL2'1400'         .HALT CODES FILLED IN
                               6830
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         4D2B 6831 R2AEXT EQU   *
   4D2B 3D 00 65F3            6832          CLI   IPLFLG,0                  *** REMOVE FOR RELEASE ***
   4D2F C0 81 0216            6833          BE    LINK                      *** REMOVE FOR RELEASE ***
   4D33 C0 87 6606            6834          B     TERLNK                    *** REMOVE FOR RELEASE ***
   4D37 C0 87 022A            6835 LNKTER   B     LOAD                      .TERMINATE SECTION
   4D3B 00                  4D3B 6836          DC    XL1'0'
                              6837
   4D3C 0000                4D3D 6838 R2AWK   DC    XL2'0'                    .WORK SPACE
   4D3E C1D5E2E6C5D94 0E3   4D67 6839          DC    CL42'ANSWER THE FOLLOWING QUESTIONS BY SETTING '
   4D46 C8C540C6D6D3D3D6      6839
   4D4E E6C9D5C740D8E4C5      6839
   4D56 E2E3C9D6D5E24 0C2     6839
   4D5E E840E2C5E3E3C1D5      6839
   4D66 C740                  6839
   4D68 E3C8C540D9C9C7C8    4D94 6840          DC    CL45'THE RIGHTMOST CONSOLE SWITCH TO ''0'' IF ''NO''. '
   4D70 E3D4D6E2E340C3D6      6840
   4D78 D5E2D6D3C540E2E6      6840
   4D80 C9E3C3C840E3D640      6840
   4D88 7DF07D40C9C64 07D     6840
   4D90 D5D67D6840            6840
   4D95 D6D9407DF17D4 0C9   4DA4 6841 NTFM1   DC    CL16'OR ''1'' IF ''YES''.'
   4D9D C6407DE2C5E27 D4B     6841
   4DA5 D9C5E2E4D4C54 0D7   4DC5 6842 NTFM2   DC    CL33'RESUME PROG BY RESETTING HALT FF.'
   4DAD D9D6C740C2E84 0D9     6842
   4DB5 C5E2C5E3E3C9D 5C7     6842
   4DBD 40C8C1D3E740C 4C6     6842
   4DC5 4B                    6842
   4DC6 C9E240E3C8C54 0C9   4DDF 6843 NTFM3   DC    CL26'IS THE I/O CHECK LIGHT ON?'
   4DCE 61D640C3C8C5C 3D2     6843
   4DD6 40D3C9C7C8E34 0D6     6843
   4DDE D56F                  6843
   4DE0 C4C5D7D9C5E2E 240   4E04 6844 NTFM4   DC    CL37'DEPRESS CHECK RESET AND RESET HALT FF'
   4DE8 C3C8C5C3D2400 5C5     6844
   4DF0 E2C5E340C1D5C 440     6844
   4DF8 D9C5E2C5E340C 6C1     6844
   4E00 D3E340C6C6            6844
   4E05 C9E240E3C8C54 0C9   4E1F 6845 NTFM5   DC    CL27'IS THE I/O CHECK LIGHT OFF?'
   4E0D 61D640C3C8C5C 3D2     6845
   4E15 40D3C9C7C8E34 0D6     6845
   4E1D C6C66F                6845
   4E20 D9C5E2E4D4C54 0D7   4E50 6846 NTFM7   DC    CL49'RESUME PROGRAM BY DEPRESSING SYSTEM RESET. START.'
   4E28 D9D6C7D9C1D44 0C2     6846
   4E30 E840C4C5D7D9C 5E2     6846
   4E38 E2C9D5C740E2E 4E2     6846
   4E40 E3C5D440D9C5E 2C5     6846
   4E48 E36B40E2E3C1D 5E3     6846
   4E50 4B                    6846
   4E51 D9C5E2C5E340C 6C1   4E7B 6847          DC    CL43'RESET HALT AND A ''PROC CHECK'' SHOULD OCCUR.'
   4E59 D3E340C1D5C44 0C1     6847
   4E61 407DD7D9D6C34 0C3     6847
   4E69 C8C5C3D27D40E 2C8     6847
   4E71 D6E4D3C440D6C 3C3     6847
   4E79 E4D948                6847
   4E7C 404DC9D5E5C1D 3C9   4E89 6848 NTFM8   DC    CL14' (INVALID XXX)'
   4E84 C440E7E7E75D          6848
   4E8A D9C5E2C5E340C 6C1   4EAA 6849          DC    CL33'RESET HALT AND SYSTEM SHOULD HANG'
   4E92 D3E340C1D5C44 0E2     6849
   4E9A E8E2E3C5D440E 2C8     6849
   4EA2 D6E4D3C440C8C 3D5     6849
   4EAA C7                    6849
   4EA8 40C9D5E5C1D3C 5C4   4EC6 6850 NTFM9   DC    CL28'(INVALID COMMAND SEQUENCE X)'
   4EB3 40C3D6D4D4C1D 5C4     6850
   4EBB 40E2C5D8E4C5D 3C3     6850
   4EC3 C540E75D              6850
   4EC7 C961D640C3C8D 2C0   4ED0 6851 NTFE1   DC    CL10'I/O CHK LT'
   4ECF D3E3                  6851
   4ED1 D5D640C8C1D5C 740   4EDA 6852 NTFE2   DC    CL10'NO HANG   '
   4ED9 4040                  6852
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   4E0B D5D640D7C3404 040   4EE4 6853 NTFE4   DC    CL10'NO PC     '
   4EE3 4040                  6853
   4EE5 E2C9D6              4EE7 6854 NTFSIO  DC    CL3'SIO'
   4EE8 E2D5E2              4EEA 6855 NTFSNS  DC    CL3'SNS'
   4EEB D3C9D6              4EED 6856 NTFLIO  DC    CL3'LIO'
   4EEE E3C9D6              4EF0 6857 NTFTIO  DC    CL3'TIO'
   4EF1 00                  4EF1 6858 RENTRY  DC    XL1'0'                    .PROGRAM RE ENTRY FLAG
                              6859
                              6860 ********************************************************************
                              6861 *      ROUTINE 41 - DC MICROPROGRAM                                *
                              6862 ********************************************************************
                              6863 *                                                                  *
                              6864 *      THIS ROUTINE WILL PERFORM A MICROPROGRAM WHICH IS INSERTED   *
                              6865 *      INTO CORE FROM LOC. 3FC0-3FFF (AS REQ.).  THE MICROPROGRAM   *
                              6866 *      MUST BE WRITTEN SO THAT IT STOPS AT A PREDICTABLE LOCATION   *
                              6867 *      WHICH WILL BE A BRANCH TO ITSELF. CAUSING THE PROGRAM TO HANG *
                              6868 *      THERE.  THE CONT. STORE ADDR. OF THIS WORD IS INSERTED IN STG. *
                              6869 *      3FBF.  AFTER THE MICROPROGRAM IS DONE. IF THE CONTENTS OF THE *
                              6870 *      LAST SENSED WORD DOES NOT AGREE WITH THE EXPECTED CONTENTS.  *
                              6871 *      A 9F HALT WILL OCCUR.                                       *
                              6872 *                                                                  *
                              6873 ********************************************************************
                              6874
   4EF2 41                  4EF2 6875 RT41    DC    XL1'41'                   .ROUTINE NUMBER
   4EF3 00                  4EF3 6876         DC    XL1'0'                    .NO MANUAL INTERVENTION
   4EF4 4FA3                4EF5 6877         DC    AL2(RT42)                 .ADDRESS OF NEXT ROUTINE
                              6878
   4EF6 C0 87 021A            6879          B     PRINT                     .PRINT MESSAGE
   4EFA 01                  4EFA 6880         DC    XL1'01'
   4EFB 1D                  4EFB 6881         DC    IL1'29'
   4EFC 4F49                4EFD 6882         DC    AL2(RT28M1)
   4EFE C0 87 021A            6883 R28GO    B     PRINT
   4F02 01                  4F02 6884         DC    XL1'01'
   4F03 2E                  4F03 6885         DC    IL1'46'
   4F04 4F77                4F05 6886         DC    AL2(RT28M2)
   4F06 C0 87 021A            6887          B     PRINT
   4F0A 07                  4F0A 6888         DC    XL1'07'
   4F0B 2B                  4F0B 6889         DC    IL1'43'
   4F0C 4FA2                4F0D 6890         DC    AL2(RT28M3)
                              6891
   4F0E C0 87 5D38            6892          B     LDOP                      .GO LOAD OP DECODE REGS.
   4F12 0C 01 4F27 3FBF       6893          MVC   R28EX1(2),R28EXD          .INSERT EXPECTED DATA
   4F18 C0 87 5918            6894          B     LOADCS                    .GO LOAD MICROPROGRAM
   4F1C 83                  4F1C 6895         DC    XL1'83'
   4F1D 3FC0                4F1E 6896         DC    AL2(R28MCS)
   4F1F 3FFF                4F20 6897         DC    AL2(R28MCE)
                              6898
   4F21 C0 87 54FE            6899          B     DOMICR                    .GO DO MICROPROGRAM
   4F25 9F                  4F25 6900         DC    XL1'9F'                   .ERROR HALT -9F-
   4F26 0000                4F27 6901 R28EX1  DC    XL2'0'                    .EXPECTED DATA FILLED IN
                              6902
   4F28 C0 87 022A            6903          B     LOAD                      .TERMINATE PROGRAM
   4F2C 00                  4F2C 6904         DC    XL1'0'
                              6905
   4F2D D9D6E4E340F4F140    4F49 6906 RT28M1  DC    CL29'ROUT 41 - MANUAL MICROPROGRAM'
   4F35 6040D4C1D5E4C1D3      6906
   4F3D 40D4C9C3D9D6D7D9      6906
   4F45 D6C7D9C1D4            6906
   4F4A D3D6C1C440C5E7D7    4F77 6907 RT28M2  DC    CL46'LOAD EXP. STOP ADDR. (00-1F) IN STG. ADDR 3FBF'
   4F52 4B40E2E3D6D74 0C1     6907
   4F5A C4C4D94B404DF 0F0     6907
   4F62 60F1C65D40C9D 540     6907
   4F6A E2E3C74B40C1C 4C4     6907
   4F72 D940F3C6C2C6          6907
   4F78 D3D6C1C440D4C 9C3   4FA2 6908 RT28M3  DC    CL43'LOAD MICROPROGRAM IN STG. 3FC0-3FFF AS REQ.'
   4F80 D9D6D7D9D6C7D 5C1     6908
   4F88 D440C9D540E2E 3C7     6908
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8912 DISPLAY ADAPTER TEST

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   4F90 4B40F3C6C3F06 0F3      6908
   4F96 C6C6C640C1E24 0D9      6908
   4FA0 C5D84B                 6908
                               6909
                               6910 ********************************************************************
                               6911 *      ROUTINE 42 - CHECK OUT C.E. CARD                            *
                               6912 ********************************************************************
                               6913 *                                                                  *
                               6914 *      THIS ROUTINE IS CODE USED TO CHECK OUT THE C.E. DIAGNOSTIC   *
                               6915 *      AID CARD TO VERIFY THAT IT IS WORKING PROPERLY.  891 MUST BE *
                               6916 *      CAPABLE OF RUNNING ERROR FREE BEFORE THIS ROUTINE CAN BE USED. *
                               6917 *                                                                  *
                               6918 ********************************************************************
                               6919
   4FA3 42                4FA3 6920 RT42   DC    XL1'42'                  ROUTINE NUMBER
   4FA4 00                4FA4 6921        DC    XL1'00'
   4FA5 5092              4FA6 6922        DC    AL2(RT43)                LAST ROUTINE
                               6923
   4FA7 C0 87 021A             6924        B     PRINT                    PRINT ROUTINE HDR
   4FAB 01                4FAB 6925        DC    XL1'01'
   4FAC 18                4FAC 6926        DC    IL1'24'
   4FAD 5091              4FAE 6927        DC    AL2(R2EMSG)
   4FAF C0 87 5D38             6928 RT2EGO B     LDOP                     .GO LOAD OPDECODE REGS.
   4FB3 C0 87 5020             6929        B     R40LD                    .GO LOAD ALL OF C.S. WITH
                               6930 *                                      BRANCH TO NEXT ADDRESS
   4FB7 C0 87 0222             6931        B     HALT                     .OPERATOR HALT  -F0-
   4FBB 14F0              4FBC 6932 R40H0  DC    XL2'14F0'
                               6933
   4FBD 3C 00 5071             6934        MVI   R40DT,0                  .RESET COUNTER
   4FC1 F3 58 E0               6935        SIO   X'E0',SIOI               .ENABLE MICRO CONTROLLER
   4FC4 0D FF 5512 55 12       6936 R40TOL CLC   REPEAT(256),REPEAT        .518 CYCLE DELAY
   4FCA 0E 00 5071 5A 0B       6937        ALC   R40DT(1),WUN             .INCREMENT COUNTER
   4FD0 C0 20 4FC4             6938        BNOL  R40TOL                   .BRANCH TIL OVERFLOW FOR DELAY
   4FD4 F3 58 80               6939        SIO   X'80',SIOI               .DISABLE
   4FD7 C0 87 0222             6940        B     HALT                     .OPERATOR HALT  -F1-
   4FDB 14F1              4FDC 6941        DC    XL2'14F1'
                               6942
   4FDD F3 58 E0               6943        SIO   X'E0',SIOI               .ENABLE MICRO CONTROLLER AGAIN
   4FE0 C0 87 0222             6944        B     HALT                     .OPERATOR HALT  -F2-
   4FE4 14F2              4FE5 6945        DC    XL2'14F2'
   4FE6 C0 87 0878             6946        B     R03ST                    .GO DO ROUTINE 3 TO SET HDB'S
   4FEA C0 87 0222             6947 R40R1  B     HALT                     .OPERATOR HALT  -F3-
   4FEE 14F3              4FEF 6948        DC    XL2'14F3'
   4FF0 C0 87 30CD             6949        B     R21ST                    .GO DO ROUTINE 21 TO SET I/O REG
   4FF4 C0 87 0222             6950 R40R2  B     HALT                     .OPERATOR HALT  -F4-
   4FF8 14F4              4FF9 6951        DC    XL2'14F4'
                               6952
   4FFA C0 87 5020             6953        B     R40LD                    .GO RELOAD CONTROL STORE
   4FFE F3 58 C0               6954 R40SY  SIO   X'C0',SIOI               .ENABLE ATTACHMENT
   5001 31 58 5073             6955        LIO   R40C1,CTSTOR             .CHG. 1ST WC = BRANCH ADDR. 2
   5005 31 58 506F             6956        LIO   R40ST,CTSTOR             .CHG. 2ND WD = BRANCH ADDR. 1
   5009 31 58 5075             6957        LIO   R40C3,CTSTOR             .CHG. 3RD WD = BRANCH ADDR. 3
   500D F3 58 80               6958        SIO   X'80',SIOI               .DISABLE
   5010 F3 58 E0               6959        SIO   X'E0',SIOI               .ENABLE MICRO CONTROLLER
   5013 0D FF 5512 55 12       6960        CLC   REPEAT(256),REPEAT       .518 CYCLE DELAY
   5019 F3 58 80               6961        SIO   X'80',SIOI               .DISABLE
   501C C0 87 4FFE             6962        B     R40SY                    .HANG IN LOOP. SYS. RESET TO
                               6963 *                                      EXIT THIS ROUTINE
                               6964 *      SUBROUTINE TO LOAD CONTROL STORE WITH BRANCH TO NEXT ADDRESS
                               6965 *
   5020 34 08 506C             6966 R40LD  ST    R40LDR+3,ARR             .STORE RETURN ADDRESS
                               6967
   5024 0C 01 5071 506F        6968 R40SLD MVC   R40DT(2),R40ST           .REINITIALIZE START DATA
   502A F3 58 80               6969        SIO   X'80',SIOI               .DISABLE
   502D F3 58 C0               6970        SIO   X'C0',SIOI               .ENABLE ATTACHMENT
   5030 31 58 5071             6971 R40L2  LIO   R40DT,CTSTOR             .LOAD C.S.
   5034 0E 01 5071 5A 0B       6972        ALC   R40DT(2),WUN             .INCREMENT DATA
   503A 0D 00 5070 50 6D       6973        CLC   R40DT-1(1),R40E          .AT LAST WORD ?
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8912 DISPLAY ADAPTER TEST

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   5040 C0 01 5030             6974        BNE   R40L2                    .LOOP IF NOT
   5044 31 58 5079             6975        LIO   RT400,CTSTOR             .PUT BRANCH TO ADDR. 400
                               6976 *                                      IN LAST WORD OF 1ST FET
   5048 0C 01 5071 506F        6977        MVC   R40DT(2),R40ST           .REINITIALIZE DATA
   504E 31 58 5071             6978 R40L3  LIO   R40DT,CTSTOR             .LOAD 2ND FET
   5052 0E 01 5071 5A 0B       6979        ALC   R40DT(2),WUN             .INCRMENT BRANCH TO NEXT ADDR
   5058 0D 00 5070 506D        6980        CLC   R40DT-1(1),R40E          .TEST FOR END OF 2ND FET
   505E C0 01 504E             6981        BNE   R40L3                    .IF NOT LOAD NEXT WORD
   5062 31 58 5077             6982        LIO   RT000,CTSTOR             .BRANCH TO ADDR 000 AT END
   5066 F3 58 80               6983        SIO   X'80',SIOI               .DISABLE
   5069 C0 87 0000             6984 R40LDR B     *-*                      .RETURN TO USER
                               6985
   506D 54                506D 6986 R40E   DC    XL1'54'                  .END OF C.S. INDICATOR
   506E 5001              506F 6987 R40ST  DC    XL2'5001'                .START DATA FOR ADDR. 001
   5070 0000              5071 6988 R40DT  DC    XL2'0'                   .LIO DATA OR COUNTER
   5072 5002              5073 6989 R40C1  DC    XL2'5002'                .BRANCH TO ADDR 2
   5074 5003              5075 6990 R40C3  DC    XL2'5003'                .BRANCH TO ADDR 3
   5076 D000              5077 6991 RT000  DC    XL2'D000'                BAL TO ADDR 000
   5078 D400              5079 6992 RT400  DC    XL2'D400'                BAL TO ADDR 400
   507A D9D5E4E340F4F240  5091 6993 R2EMSG DC    CL24'ROUT 42 CE CARD CHECKOUT'
   5082 C3C540C3C1D9C440       6993
   508A C3C8C5C3D2D6E4E3       6993
                               6994
                               6995 ********************************************************************
                               6996 *      ROUTINE 43 - DUMP HDB'S AND CONTROL STORE.                  *
                               6997 ********************************************************************
                               6998 *                                                                  *
                               6999 *      THIS ROUTINE CAN BE USED TO DUMP THE CONTENTS OF THE HDB'S. *
                               7000 *      AND CONTROL STORAGE.                                        *
                               7001 *                                                                  *
                               7002 ********************************************************************
                               7003
   5092 43                5092 7004 RT43   DC    XL1'43'
   5093 00                5093 7005        DC    XL1'00'
   5094 FFFF              5095 7006        DC    XL2'FFFF'
   5096 C0 87 021A             7007        B     PRINT                    PRINT ROUTINE HEADING
                               7008
   509A 01                509A 7009        DC    XL1'01'
   509B 1D                509B 7010        DC    IL1'29'
   509C 50D2              509D 7011        DC    AL2(R2FMSG)
   509E C0 87 5D38             7012 R2FADL B     LDOP                     .GO LOAD OP DECODES
   50A2 C0 87 5BF9             7013        B     HDBL                     .GO DUMP LOW HDB'S
   50A6 C0 87 5BE7             7014        B     HDBH                     .GO DUMP HIGH HDB'S
   50AA C0 87 1056             7015        B     HDBL1
   50AE C0 87 1084             7016        B     HDBH1
   50B2 C0 87 50D3             7017        B     R2CST
   50B6 D9D6E4E340F0F140  50D2 7018 R2FMSG DC    CL29'ROUT 01 HDB & CS DUMP UTILITY'
   50BE C8C4C2405040C3E2       7018
   50C6 40C4E4D4D740E4E3       7018
   50CE C9D3C9E3E8             7018
                               7019
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          7021
                          7022 ********************************************************************
                          7023 *      ROUTINE 43 CONTINUED. START CTL STORE DUMP                  *
                          7024 ********************************************************************
                          7025 *                                                                  *
 50D3 38 08 0208          7026 R2CST  SBF   SBYTE0,X'08'          .RESET SENSE SWITCH 04
 50D7 C0 87 5D38          7027        B     LDOP                  .GO LOAD OP DECODES
 50DB F3 58 80            7028        SIO   X'80',SIO1            .RESET ATTACHMENT
 50DE F3 58 C0            7029 R2CENA SIO   X'C0',SICI            .ENABLE ATTACHMENT
 50E1 3C 00 5229          7030        MVI   RT2CAT,0              .RESET ATT. CHK. FLG.
 50E5 0F 01 5673 5673     7031        SLC   R05W01(2),R05W01      .SET STARTING ADDRESS TO ZERO
 50E6 C2 01 5701          7032 R2CRST LA    R05W1B,XR1            .POINT XR1 TO START OF DUMP AREA
                          7033
 50EF 30 58 5FE6          7034 R2CK01 SNS   STATAC,CTSTCR         .SENSE CONTROL STORE WORD
 50F3 4C 01 01 5FE6       7035        MVC   1(2,XR1),STATAC       .MOVE TO DUMP AREA
 50F8 3D 00 5229          7036        CLI   RT2CAT,0              .TEST FOR NO ATT. CHK. YET
 50FC F2 01 04            7037        JNE   R2CINC                .JUMP IF ATT. CHK. HAS OCCURRED
 50FF C1 5D 5203          7038        TIO   R2CATT,ATTCHK         .TEST FOR ATTACHMENT CHECK
 5103 D2 01 02            7039 R2CINC LA    2(,XR1),XR1           .INCREMENT TO NEXT WORD
 5106 0E 01 5673 5A 0B    7040        ALC   R05W01(2),=UN         .INCREMENT ADDRESS
 510C 3D 00 5673          7041        CLI   R05W01,0              .TEST FOR INCR. TO ZERO
 5110 C0 01 50EF          7042        BNE   R2CK01                .SENSE NEXT WORD IF NOT
                          7043
 5114 3C 80 51CE          7044        MVI   R2CPX,X'80'           .SET UP FOR 1ST 256 WORDS
 5118 3D 01 5672          7045        CLI   R05W01-1,1            .TEST FOR 1ST 256 WORDS
 511C F2 81 9E            7046        JE    R2CP13                .JUMP IF 1ST 256 WORDS
 511F 3C 40 51CE          7047        MVI   R2CPX,X'40'           .SET UP FOR 2ND 256 WORDS
 5123 3D 02 5672          7048        CLI   R05W01-1,2            .TEST FOR 2ND 256 WORDS
 5127 F2 81 93            7049        JE    R2CP13                .JUMP IF 2ND 256 WORDS
 512A 3C 20 51CE          7050        MVI   R2CPX,X'20'           .SET UP FOR 3RD 256 WORDS
 512E 3D 03 5672          7051        CLI   R05W01-1,3            .TEST FOR 3RD 256 WORDS
 5132 F2 81 88            7052        JE    R2CP13                .JUMP IF 3RD 256 WORDS
 5135 3C 10 51CE          7053        MVI   R2CPX,X'10'           .SET UP FOR 4TH 256 WORDS
                          7054
 5139 3D 04 5672          7055        CLI   R05W01-1,X'04'        TEST FOR 4TH 256 WORDS
 513D F2 81 7D            7056        JE    R2CP13
 5140 3C 8C 51CE          7057        MVI   R2CPX,X'8C'           SET FOR 1ST 256 WORDS OF 2ND FET
 5144 3D 05 5672          7058        CLI   R05W01-1,X'05'        TEST FOR 1ST 256 WRDS OF 2ND FET
 5148 F2 81 72            7059        JE    R2CP13
 514B 3C 4C 51CE          7060        MVI   R2CPX,X'4C'           SET FOR 2ND 256 WORDS OF 2ND FET
 514F 3D 06 5672          7061        CLI   R05W01-1,X'06'        TEST FOR 2ND 256 WRDS OF 2ND FET
 5153 F2 81 67            7062        JE    R2CP13
 5156 3C 2C 51CE          7063        MVI   R2CPX,X'2C'           SET FOR 3RD 256 WORDS OF 2ND FET
 515A 3D 07 5672          7064        CLI   R05W01-1,X'07'        TEST FOR 3RD 256 WRDS OF 2ND FET
 515E F2 81 5C            7065        JE    R2CP13
 5161 3C 1C 51CE          7066        MVI   R2CPX,X'1C'           SET THE 4TH 256 WORDS OF 2ND FET
 5165 3D 08 5672          7067        CLI   R05W01-1,X'08'        TEST FOR 4TH 256 WRDS OF 2ND FET
 5169 F2 81 51            7068        JE    R2CP13
 516C 3C 8A 51CE          7069        MVI   R2CPX,X'8A'           SET FOR 1ST 256 WORDS OF 3RD FET
 5170 3D 09 5672          7070        CLI   R05W01-1,X'09'        TEST FOR 1ST 256 WRDS OF 3RD FET
 5174 F2 81 46            7071        JE    R2CP13
 5177 3C 4A 51CE          7072        MVI   R2CPX,X'4A'           SET FOR 2ND 256 WORDS OF 3RD FET
 517B 3D 0A 5672          7073        CLI   R05W01-1,X'0A'        TEST FOR 2ND 256 WRDS OF 3RD FET
 517F F2 81 3B            7074        JE    R2CP13
 5182 3C 2A 51CE          7075        MVI   R2CPX,X'2A'           SET FOR 3RD 256 WORDS OF 3RD FET
 5186 3D 0B 5672          7076        CLI   R05W01-1,X'0B'        TEST FOR 3RD 256 WRDS OF 3RD FET
 518A F2 81 30            7077        JE    R2CP13
 518D 3C 1A 51CE          7078        MVI   R2CPX,X'1A'           SET FOR 4TH 256 WORDS OF 3RD FET
 5191 3D 0C 5672          7079        CLI   R05W01-1,X'0C'        TEST FOR 4TH 256 WRDS OF 3RD FET
 5195 F2 81 25            7080        JE    R2CP13
 5198 3C 89 51CE          7081        MVI   R2CPX,X'89'           SET FOR 1ST 256 WORDS OF 4TH FET
 519C 3D 0D 5672          7082        CLI   R05W01-1,X'0D'        TEST FOR 1ST 256 WRDS OF 4TH FET
 51A0 F2 81 1A            7083        JE    R2CP13
 51A3 3C 49 51CE          7084        MVI   R2CPX,X'49'           SET FOR 2ND 256 WORDS OF 4TH FET
 51A7 3D 0E 5672          7085        CLI   R05W01-1,X'0E'        TEST FOR 2ND 256 WRDS OF 4TH FET
 51AB F2 81 0F            7086        JE    R2CP13
 51AE 3C 29 51CE          7087        MVI   R2CPX,X'29'           SET FOR 3RD 256 WORDS OF 4TH FET
 51B2 3D 0F 5672          7088        CLI   R05W01-1,X'0F'        TEST FOR 3RD 256 WRDS OF 4TH FET
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 51B6 F2 81 04            7089        JE    R2CP13
 51B9 3C 19 51CE          7090        MVI   R2CPX,X'19'           SET FOR 4TH 256 WORDS OF 4TH FET
 51BD 0C 00 51C4 51CE     7091 R2CP13 MVC   R2CTSX+1(1),R2CPX     .MOVE IN CONSTANT TO TEST
                          7092 *                                  SENSE SWITCH ON
 51C3 38 00 020B          7093 R2CTSX TBN   SBYTE3,*-*           .TEST SENSE SWITCH ON
 51C7 F2 10 05            7094        JT    R2CK02                .SKIP PRINTOUT IF ON
 51CA C0 87 5567          7095        B     R05DCS                .GO PRINT 256 WORDS
 51CE 00                  51CE 7096 R2CPX  DC    XL1'0'              .CONSTANT TO SELECT 256 BLOCK
                          7097 *                                  GETS FILLED IN
 51CF 3D 04 5672          7098 R2CK02 CLI   R05W01-1,X'04'        TEST FOR END OF 1ST FET
 51D3 C0 82 50EB          7099        BL    R2CRST
 51D7 3D 08 5672          7100        CLI   R05W01-1,X'08'        TEST FOR END OF 2ND FET
 51DB C0 82 50EB          7101        BL    R2CRST
 51DF 38 02 0A0C          7102        TBN   LDT2,X'02'            3RD FET INSTALLED?
 51E3 C0 90 51F7          7103        BF    ACHCHK
 51E7 3D 0C 5672          7104        CLI   R05W01-1,X'0C'        TEST FOR END OF 3RD FET
 51EB C0 82 50EB          7105        BL    R2CRST
 51EF 3D 10 5672          7106        CLI   R05W01-1,X'10'        TEST FOR END OF 4TH FET
 51F3 C0 82 50EB          7107        BL    R2CRST
 51F7 3D 00 5229          7108 ACHCHK CLI   RT2CAT,X'00'          TEST FOR NO ATTACHMENT CHECK
 51FB F2 01 1F            7109        JNE   R2CPRT                .PRINT MESSAGE IF ATT. CHK.
 51FE C0 87 022A          7110 R2CTER B     LOAD                  .TERMINATE ROUTINE
 5202 00                  5202 7111        DC    XL1'0'
                          7112
 5203 3C FF 5229          7113 R2CATT MVI   RT2CAT,X'FF'          .SET ATTACHMENT CHECK ON
 5207 C0 87 021E          7114        B     UNPACK                .UNPACK ADDRESS
 520B 02                  520B 7115        DC    XL1'02'
 520C 5673                520D 7116        DC    AL2(R05W01)
 520E 524C                520F 7117        DC    AL2(R2CMG1)
 5210 C0 87 021E          7118        B     UNPACK                .UNPACK DATA
 5214 02                  5214 7119        DC    XL1'02'
 5215 5FE6                5216 7120        DC    AL2(STATAC)
 5217 5259                5218 7121        DC    AL2(R2CMG2)
 5219 C0 87 5103          7122        B     R2CINC                .RETURN TO MAIN LOOP
                          7123
 521D C0 87 021A          7124 R2CPRT B     PRINT                 .PRINT 1ST ATT. CHK. MSG.
 5221 06                  5221 7125        DC    XL1'06'
 5222 30                  5222 7126        DC    IL1'48'
 5223 5259                5224 7127        DC    AL2(R2CMG2)
 5225 C0 87 51FE          7128        B     R2CTER                .TERMINATE
                          7129
 5229 00                  5229 7130 RT2CAT DC    XL1'0'              .ATTACHMENT CHECK FLAG
                          7131
 522A C6C9D9E2E340C1E3 524C 7132 R2CMG1 DC    CL35'FIRST ATTACHMENT CHECK AT ADDR XXXX'
 5232 E3C1C3C8D4C5D3E3    7132
 523A 40C3C8C5C3D24CC1    7132
 5242 E340C1C4C4D94CE7    7132
 524A E7E7E7              7132
 524D 6B40C4C1E3C14C7E 5259 7133 R2CMG2 DC    CL13'. DATA = XXXX'
 5255 40E7E7E7E7          7133
                          7134 ************************************
                          7135 *  SUBROUTINE PRINT I/O REGISTER ***************************************
                          7136 ************************************                                  *
                          7137 *                                                                     *
                          7138 *      THIS SUBROUTINE IS ENTERED IF A DATA MISCOMPARE                *
                          7139 *      OCCURS WHILE WRAPPING DATA IN DIAGNOSTIC MODE.                 *
                          7140 *      THE FOLLOWING PARAMETERS MUST BE IN THE HDB'S:                 *
                          7141 *                                                                     *
                          7142 *      HDB 00 BIT 0 = VALUE FOR BIT 13 TO BE TRANSMITTED              *
                          7143 *             BIT 6 = VALUE FOR BIT 2 TO BE TRANSMITTED               *
                          7144 *             BIT 7 = VALUE FOR BIT 3 TO BE TRANSMITTED               *
                          7145 *      HDB 01 BITS 0-7 = BITS 4-11 TO BE TRANSMITTED                  *
                          7146 *      HDB 03 = HEX NUMBER OF WORDS TRANSMITTED/RECEIVED              *
                          7147 *      HDB 05 = 00 IF NO RECEIVE CHECK OCCURRED                       *
                          7148 *             = FF IF A RECEIVE CHECK OCCURRED                        *
                          7149 *      HDB 06 = BITS 2,3,13 RECEIVED (SAME PATTERN AS HDB 00)         *
                          7150 *      HDB 07 = BITS 4-11 RECEIVED                                    *
                          7151 *                                                                     *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          7152 *      THE ROUTINE WILL THEN CHECK FOR A DATA ERROR (MICRO HALT AT    *
                          7153 *      ADDR 035).  IF THERE IS NOT A DATA ERROR, A HALT WILL OCCUR    *
                          7154 *      IF THERE IS A DATA ERROR. THE INFORMATION TRANSMITTED AND      *
                          7155 *      RECEIVED WILL BE FORMATTED AND PRINTED OUT.                    *
                          7156 *                                                                     *
                          7157 ***************************************************************************
                          7158
 525A 34 08 535F          7159 PIOREG ST    PIORTN+3,ARR          ,STORE RETURN ADDRESS
 525E 34 01 535B          7160        ST    PIOXR1+3,XR1          ,STORE XR1
 5262 0D 01 5FE6 54EA     7161        CLC   STATAC(2),X5035       ,CHECK FOR DATA ERROR
 5268 C0 01 5343          7162        BNE   MVHLT                 ,IF NOT, GO HALT
 526C 3C E6 65F8          7163        MVI   ERRLOG-9,C'W'         ,INSERT CHAR IN LOG OUT        *
 5270 3C 40 6600          7164        MVI   ERRLOG-1,C' '         ,BLANK OUT UNUSED LOG OUT      *
 5274 F3 58 80            7165        SIO   X'80',SIOI            ,DISABLE ATTACHMENT
 5277 30 48 5455          7166        SNS   PIOL1,HDE0            ,SENSE HDB 00-01
 5278 30 49 5457          7167        SNS   PIOL2,HDE1            ,SENSE HDB 02-03
 527F 30 4A 5459          7168        SNS   PIOL3,HDE2            ,SENSE HDB 04-05
 5283 30 4B 5FE6          7169        SNS   STATAC,HDB3           ,SENSE HDB 06-07
 5287 C2 02 5299          7170        LA    PIOB1,XR2             ,LOAD RETURN ADDR.
 528B 0C 01 545B 5445     7171        MVC   PIOWK1(2),PIOL1       ,MOVE WORD TRANSMITTED TO
                          7172 *                                    WORK AREA
 5291 C2 01 53F6          7173        LA    XRM2-6,XR1            ,POINT XR1 TO BIT 11 PRINTOUT
 5295 C0 87 545F          7174        B     SETPO                 ,GO FORMAT PRINT FIELD
 5299 C2 02 52A8          7175 PIOB1  LA    PIOB2,XR2             ,LOAD RETURN ADDRESS.
 529D 0C 01 545B 5FE6     7176        MVC   PIOWK1(2),STATAC      ,MOVE WORD RECEIVED TO
                          7177 *                                    WORK AREA
 52A3 C2 01 5421          7178        LA    XRM3-6,XR1            ,POINT XR1 TO BIT 11 IN PRINT
 52A7 C0 87 545F          7179        B     SETPO                 ,GO FORMAT PRINT FIELD
 52AB 39 FF 5459          7180 PIOB2  TBF   PIOL3,X'FF'           ,TEST FOR REC. CHK
 52AF F2 10 0F            7181        JT    NORC                  ,CONTINUE IF NONE
 52B2 78 01 1E            7182        TBN   30(,XR1),X'01'        ,TEST, BIT 12 MUST BE INVERTED
 52B5 F2 10 06            7183        JT    SB12F                 ,JUMP IF BIT 12 IS ON
 52B8 7A 01 1E            7184        SBN   30(,XR1),X'01'        ,CHANGE 0 TC 1
 52BB F2 87 03            7185        J     NORC                  ,CONTINUE
 52BE 7B 01 1E            7186 SB12F  SBF   30(,XR1),X'01'        ,CHANGE 1 TC 0
                          7187
 52C1 C0 87 021A          7188 NORC   B     PRINT                 ,PRINT I/O REG TITLE
 52C5 81            52C5  7189        DC    XL1'81'
 52C6 47            52C6  7190        DC    IL1'71'
 52C7 53A6          52C8  7191        DC    AL2(XRMT)
 52C9 C0 87 021A          7192        B     PRINT                 ,PRINT BIT TITLE
 52CD 81            52CD  7193        DC    XL1'81'
 52CE 2B            52CE  7194        DC    IL1'43'
 52CF 53D1          52D0  7195        DC    AL2(XRM1)
 52D1 C0 87 021A          7196        B     PRINT                 ,PRINT WORD TRANSMITTED
 52D5 81            52D5  7197        DC    XL1'81'
 52D6 2B            52D6  7198        DC    IL1'43'
 52D7 53FC          52D8  7199        DC    AL2(XRM2)
 52D9 C0 87 021A          7200        B     PRINT                 ,PRINT WORD RECIEVED
 52DD 81            52DD  7201        DC    XL1'81'
 52DE 2B            52DE  7202        DC    IL1'43'
 52DF 5427          52E0  7203        DC    AL2(XRM3)
 52E1 C0 87 021E          7204        B     UNPACK                ,UNPACK NUMBER OF TRIES
 52E5 01            52E5  7205        DC    XL1'01'
 52E6 5457          52E7  7206        DC    AL2(PIOL2)
 52E8 544D          52E9  7207        DC    AL2(XRM6-6)
 52EA 3C D5 65FD          7208        MVI   ERRLOG-4,C'N'         ,SET LOG OUT FOR NO REC. CHK.  *
 52EE 0C 01 65FF 5440     7209        MVC   ERRLOG-2(2),XRM6-6    ,MOVE IN NO. OF TRIES          *
 52F4 C0 87 021E          7210        B     UNPACK                ,UNPACK BITS 2-3               *
 52F8 C1            52F8  7211        DC    XL1'01'                                              *
 52F9 545A          52FA  7212        DC    AL2(PIOWK1-1)                                        *
 52FB 63FD          52FC  7213        DC    AL2(R18WK)
 52FD 0C 00 65F9 63FD     7214        MVC   ERRLOG-8(1),R18WK     ,MOVE CHAR. FOR BITS 2-3       *
 5303 C0 87 021E          7215        B     UNPACK                ,UNPACK BITS 4-7               *
 5307 01            5307  7216        DC    XL1'01'                                              *
 5308 5459          5309  7217        DC    AL2(PIOWK1)                                          *
 530A 65F8          5308  7218        DC    AL2(ERRLOG-6)                                        *
                          7219
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 530C 0C 01 5342 54EE     7220        MVC   PIOADR(2),R2AMA       ,INITIALIZE PRINT ADDRESS
 5312 39 FF 5459          7221        TBF   PIOL3,X'FF'           ,CHECK RECEIVE CHECK
 5316 F2 10 0B            7222        JT    NORC1
 5319 3C 29 5340          7223        MVI   PIOLTH,41             ,INSERT LENGTH OF MESSAGE
 531D 3C D9 65FD          7224        MVI   ERRLOG-4,C'R'         ,SET REC. CHK IN LOG OUT       *
 5321 F2 87 04            7225        J     PLAST                 ,JUMP TO PRINT LAST LINE
 5324 3C 2C 5340          7226 NORC1  MVI   PIOLTH,44             ,INSERT LENGTH OF MESSAGE
 5328 3D 35 0A03          7227 PLAST  CLI   PRTN,X'35'            ,CHECK FOR ROUTINE 35
 532C F2 01 0C            7228        JNE   PLASTA                ,JUMP IF NOT
 532F 0F 00 5340 54EC     7229        SLC   PIOLTH(1),X1C         ,SHORTEN MESSAGE IF RTN 35
 5335 0F 01 5342 54EC     7230        SLC   PIOADR(2),X1C         ,CHANGE ADDRESS IF RTN 35
 5338 C0 87 021A          7231 PLASTA B     PRINT                 ,PRINT LAST INFORMATION
 533F 82                  7232        DC    XL1'82'
 5340 00                  7233 PIOLTH DC    IL1'0'                ,LENGTH GETS FILLED IN
 5341 5453                7234 PIOADR DC    AL2(XRM6)
                          7235
 5343 0C 00 5357 55AE     7236 MVHLT  MVC   PIOEH(1),STATHC       ,MOVE IN HALT CODE
 5349 C0 87 63FE          7237 PIOHLT B     ELPO
 534D C0 87 021A          7238        B     PRINT                 ,SPACE 7 LINES
 5351 97                  7239        DC    XL1'97'
 5352 C0 87 0222          7240        B     HALT                  ,GO HALT
 5356 1400                7241 PIOEH  DC    XL2'1400'             ,HALT CODE GETS FILLED IN
                          7242
 5358 C2 01 0000          7243 PIOXR1 LA    *-*,XR1               ,RESTORE XR1
 535C C0 87 0000          7244 PIORTN B     *-*                   ,RETURN TO USER
                          7245
                          7245
 5360 4040404040404040    7246        DC    CL50'          -I/O REGISTER-  NOTE, BIT 12 (PARITY) '
 5368 4040404060C96D6     7246
 5370 40D9C5C7C9E2E3C5    7246
 5378 D9604040D5D6E3C5    7246
 5380 6840C2C9E340F1F2    7246
 5388 404DD7C1D9C9E3E8    7246
 5390 5D40                7246
 5392 C9E240E3C8C54CC3    7247 XRMT   DC    CL21'IS THE COMPUTED VALUE'
 539A D6D4D7E4E3C5C440    7247
 53A2 E5C1D3E4C5          7247
 53A7 C2C9E3404040F140    7248 XRM1   DC    CL43'BIT  1  2  3  4  5  6  7  8  9 10 11 12 13'
 53AF 40F24040F3404F4     7248
 53B7 4040F54040F64040    7248
 53BF F74040F84040F940    7248
 53C7 F1F040F1F140F2F2    7248
 53CF 40F1F3              7248
 53D2 E7D4C9E34040F140    7249 XRM2   DC    CL43'XMIT 1 X X X X X X X X X X X''X'' X'
 53DA 40E74040E7404CE7    7249
 53E2 4040E74040E74040    7249
 53EA E74040E74040E740    7249
 53F2 40E74040E7407DE7    7249
 53FA 7D40E7              7249
 53FD D9C5C37DC440F140    7250 XRM3   DC    CL43'REC''D 1 X X X X X X X X X X X''X'' X'
 5405 40F74040E7404CE7    7250
 540D 4040E74040E74040    7250
 5415 E74040E74040E740    7250
 541D 40E74040E7407DE7    7250
 5425 7D40E7              7250
 5428 D5D640              7251 XRM4   DC    CL3'NO '
 542B D9C5C3C5C9E5C540    7252 XRM5   DC    CL13'RECEIVE CHECK'
 5433 C3C8C5C3D2          7252
 5438 6B40C6C1C9D3C5C4    7253 XRM6   DC    CL28', FAILED ON TRY NO. XX (HEX)'
 5440 40D6D540E3D9E640    7253
 5448 D5D64B40E7E74C4D    7253
 5450 C8C5E75D            7253
                          7254
 5454 0000                7255 PIOL1  DC    XL2'0'                ,LOG HDB 00-01
 5456 0000                7256 PIOL2  DC    XL2'0'                ,LOG HDB 02-03
 5458 0000                7257 PIOL3  DC    XL2'0'                ,LOG HDB 04-05
 545A 0000                7258 PIOWK1 DC    XL2'0'                ,WORK SPACE
 545C 00                  7259 PAR    DC    XL1'0'                ,PARITY PREDICTOR WORK SPACE
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   545D FFFD             545E 7260 NEG3   DC    XL2'FFFD'
                              7261
   545F 3C 01 5468            7262 SETPO  MVI   TSTBIT+1,X'01'
   5463 3C 00 545C            7263        MVI   PAR,X'00'
   5467 38 00 5458            7264 TSTBIT TBN   PIOWK1,X'00'
   546B F2 10 06              7265        JT    SET1
   546E 7C F0 00              7266        MVI   0(,XR1),C'0'
   5471 F2 87 09              7267        J     NEXT
   5474 7C F1 00              7268 SET1   MVI   0(,XR1),C'1'
   5477 0E 00 545C 5A08       7269        ALC   PAR(1),WUN
   547D 36 01 545E            7270 NEXT   A     NEG3,XR1
   5481 0E 00 5468 5408       7271        ALC   TSTBIT+1(1),TSTBIT+1
   5487 F2 81 04              7272        JZ    HIBITS
   548A C0 87 5467            7273        B     TSTBIT
                              7274
   548E 38 01 545A            7275 HIBITS TBN   PIOWK1-1,X'01'
   5492 F2 10 06              7276        JT    SET3
   5495 7C F0 00              7277        MVI   0(,XR1),C'0'
   5498 F2 87 09              7278        J     TB2
   5498 7C F1 00              7279 SET3   MVI   0(,XR1),C'1'
   549E 0E 00 545C 5A08       7280        ALC   PAR(1),WUN
   54A4 36 01 545E            7281 TB2    A     NEG3,XR1
   54A8 38 02 545A            7282        TBN   PIOWK1-1,X'02'
   54AC F2 10 06              7283        JT    SET2
   54AF 7C F0 00              7284        MVI   0(,XR1),C'0'
   54B2 F2 87 09              7285        J     TB13
   54B5 7C F1 00              7286 SET2   MVI   0(,XR1),C'1'
   54B8 0E 00 545C 5A08       7287        ALC   PAR(1),WUN
   54BE 38 80 545A            7288 TB13   TBN   PIOWK1-1,X'80'
   54C2 F2 10 0A              7289        JT    SET13
   54C5 7C F0 21              7290        MVI   33(,XR1),C'0'
   54C8 3C F0 65FC            7291        MVI   ERRLOG-5,C'0'
   54CC F2 87 07              7292        J     CB12
   54CF 7C F1 21              7293 SET13  MVI   33(,XR1),C'1'
   54D2 3C F1 65FC            7294        MVI   ERRLOG-5,C'1'
   54D6 38 01 545C            7295 CB12   TBN   PAR,X'01'
   54DA F2 10 06              7296        JT    SET12
   54DD 7C F0 1E              7297        MVI   30(,XR1),C'0'
   54E0 F2 87 03              7298        J     RTN
   54E3 7C F1 1E              7299 SET12  MVI   30(,XR1),C'1'
   54E6 E0 87 00              7300 RTN    B     0(,XR2)
   54E9 5035            54EA  7301 X5035  DC    XL2'5035'
   54EB 001C            54EC  7302 X1C    DC    XL2'1C'
   54ED 5453            54EE  7303 R2AMA  DC    AL2(XRM6)
                              7304
                              7305 *********************************
                              7306 *  SUBROUTINE  DO MICROPROGRAM ***********************************************
                              7307 *********************************
                              7308 *
                              7309 *       THIS SUBROUTINE EXECUTES THE MICROPROGRAM AT THE LOCATION IN
                              7310 *       MIAR. DELAYS 518 CYCLES AND THEN STOPS THE MICROPROGRAM. A
                              7311 *       SENSE OF CONTROL STORAGE IS THEN DONE AND THE INFORMATION IN
                              7312 *       CONTROL STORAGE IS COMPARED FOR THE EXPECTED VALUE.  IF IN-
                              7313 *       CORRECT, A HALT OCCURS AND THE EXPECTED AND ACTUAL DATA ARE
                              7314 *       PRINTED OUT.
                              7315 *
                              7316 *       IF MORE THAN 518 CYCLES OF DELAY ARE NEEDED, ENTER HEX# OF
                              7317 *       DELAYS IN STG. LOC. 'LPCNT'.
                              7318 *
                              7319 *       B      DOMICR                 BRANCH TO SUBROUTINE
                              7320 *       DC     XL1'ID'                ID = HALT CODE. ENTRY 1
                              7321 *       DC     XL2'HHHH'              HHHH = EXPECTED DATA. ENTRY 1
                              7322 *
                              7323 *       IF PROGRAM IS TO BE RUN FROM STG 2, BRANCH TO 'DOMIC2'
                              7324 *       INSTEAD.  ALL OTHER PARAMETERS ARE THE SAME.
                              7325 *
                              7326 ***************************************************************************
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```
*CONSTANT NEGATIVE THREE

*INITIALIZE TEST BIT INSTR.
*INITIALIZE PARITY PREDICTOR
*TEST BIT (SET BY PRG.)
*JUMP IF ON
*MOVE A 0 TO BIT POSITION
*CONTINUE
*MOVE A 1 TO BIT POSITION
*ADD 1 TO PARITY
*SUBTRACT 3 FROM XR1
*SHIFT BIT TESTED LEFT ONE
*GO TEST HI BITS IF ZERO
*GO TEST NEXT BIT

*TEST FOR BIT 3 ON
*JUMP IF SO
*MOVE A 0 TO BIT POSITION
*GO TEST BIT 2
*MOVE A 1 TO BIT 3
*ADD ONE TO PARITY
*SUBTRACT 3 FROM XR1
*TEST FOR BIT 2 ON
*JUMP IF TRUE
*SET BIT 2 TO 0
*GO TEST BIT 13
*SET BIT 2 TO 1
*ADD TO PAR
*TEST FOR BIT 13 ON
*JUMP IF SO
*SET BIT 13 TO 0
*SET BIT 13 IN LOG OUT OFF
*GO SET BIT 12 (PARITY)
*GO SET BIT 13 ON
*SET BIT 13 IN LOG OUT
*TEST FOR BITS ODD
*JUMP IF SO
*SET PARITY BIT = 0
*GO EXIT
*SET PARITY BIT = 1
*RETURN TO MAINLINE
*CONSTANT STOPPING POINT
*CONSTANT 28
*ADDRESS CONSTANT
```


8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              7327
   54EF 34 08 5562            7328 DOMIC2 ST    DOMIRA+3,ARR
   54F3 3C F0 551E            7329        MVI   MICEN+2,X'F0'
   54F7 3C D0 553A            7330        MVI   STPMC+2,X'D0'
   54FB F2 87 0C              7331        J     MICOM
   54FE 34 08 5562            7332 DOMICR ST    DOMIRA+3,ARR
   5502 3C E0 551E            7333        MVI   MICEN+2,X'E0'
   5506 3C C0 553A            7334        MVI   STPMC+2,X'C0'
   550A 34 01 555E            7335 MICOM  ST    DOMIX1+3,XR1
   550E 35 01 5562            7336        L     DOMIRA+3,XR1
   5512 1C 00 554E 00         7337 REPEAT MVC   STATHC,0(1,XR1)
   5517 1C 01 5550 02         7338        MVC   STATE1,2(2,XR1)
                              7339
   551C F3 58 E0              7340 MICEN  SIO   X'E0',SIOI
   551F 0D FF 5512 5512       7341 DELAY  CLC   REPEAT,REPEAT(256)
   5525 0D 01 5564 0D62       7342        CLC   LPCNT,ZERO(2)
   552B F2 81 0A              7343        JE    STPMC
   552E 0F 01 5564 5A08       7344        SLC   LPCNT,WUN(2)
   5534 C0 87 551F            7345        B     DELAY
   5538 F3 58 C0              7346 STPMC  SIO   X'C0',SIOI
   553B 30 58 5FE6            7347        SNS   STATAC,CTSTOR
   553F 0D 01 5FE6 5550       7348        CLC   STATAC,STATE1(2)
   5545 C0 81 5551            7349        BE    REST
                              7350
   5549 C0 87 5DA5            7351 MICERR B     STATUS
   554D 10                    7352 EHBP   DC    XL1'10'
   554E 00                    7353 STATHC DC    XL1'00'
   554F 0000                  7354 STATE1 DC    XL2'00'
                              7355
   5551 0E 01 5562 5566       7356 REST   ALC   DOMIRA+3(2),THREE
   5557 3B 03 554D            7357        SBF   EHBP,X'03'
                              7358 *
   5558 C2 01 0000            7359 DOMIX1 LA    *-*,XR1
   555F C0 87 0000            7360 DOMIRA B     *-*
                              7361
   5563 0000                  7362 LPCNT  DC    XL2'00'
   5565 0003                  7363 THREE  DC    XL2'0003'
                              7364
```

```
*STORE ARR
*SET TO RUN MICRO FROM STG 2

*JUMP TO MAIN ROUTINE
*STORE ARR
*SET TO RUN MICRO FROM STG 1

*STORE XR1
*POINT XR1 TO PARAMETERS
*STORE HALT CODE
*STORE EXPECTED DATA

*START MICROCONTROLLER
*DELAY 518 CYCLES
*CHECK LOOP COUNT FOR ZERO
*STOP MICRO CONTROLLER IF SO
*SUBTRACT ONE FROM LOOP COUNT
*GO BACK TO DELAY AGAIN
*STOP MICRO CONTROLLER
*SENSE CONTROL STORE CONTENTS
*COMPARE TO EXPECTED VALUES
*BRANCH IF OKAY

*GO TO STATUS ROUTINE
*PRINT EXP/ACTUAL DATA & MSG
*DESIRED HALT CODE
*EXPECTED DATA

*UPDATE RETURN ADDRESS
*RESET THE BYPASS ERROR STOP BIT
 AND THE BYPASS PRINT/STOP BIT
*RESTORE XR1
*RETURN TO USER

*LOOP COUNTER (NORMALLY ZERO)
*CONSTANT THREE
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         7366 *********************
                         7367 * SUBROUTINE R05DCS ***************************************************
                         7368 *********************                                                 *
                         7369 * PURPOSE OF SUBROUTINE: TO DUMP 256 WORDS OF SPECIFIED FSQ           *
                         7370 *                                                                     *
                         7371 * LINKAGE:   B     R0EDCS                                           *
                         7372 *            DC    XL1'XX'          .FLAG BYTE                      *
                         7373 *                                                                     *
                         7374 *                  BIT 0  -  FSQ 1 COUNT INITIALIZATION           *
                         7375 *                  BIT 1  -  FSQ 2 COUNT INITIALIZATION           *
                         7376 *                  BIT 2  -  FSQ 3 COUNT INITIALIZATION           *
                         7377 *                  BIT 3  -  FSQ 4 COUNT INITIALIZATION           *
                         7378 *                  BITS-4-5-6-7                                   *
                         7379 *                       1-X-X-X 2ND,3RD, OR 4TH FET INITIZ'N      *
                         7380 *                       1-1-0-0 2ND FET INITIALIZATION            *
                         7381 *                       1-0-1-0 3RD FET INITIALIZATION            *
                         7382 *                       1-0-0-1 4TH FET INITIALIZATION            *
                         7383 *                                                                 *
                         7384 ***************************************************************************
                         7385
                         7385
5567 34 08 566B          7386 R05DCS ST    R05DRB+3,ARR          .STORE XR1, XR2, PSR, ARR & GET
556B 34 01 5663          7387        ST    R05DX1+3,XR1           THE FLAG BYTE.
556F 34 02 5667          7388        ST    R05DX2+3,XR2
5573 34 04 566D          7389        ST    R05DPS,PSR
5577 35 04 56E7          7390        L     R05ZER,PSR            .CLEAR PSR
557B 35 01 5668          7391        L     R05DRB+3,XR1
557F 1C 00 566E 00       7392        MVC   R05DFL,0(1,XR1)       .TRANSFER THE FLAG BYTE
5584 D2 01 01            7393        LA    1(,XR1),XR1           .INCREMENT TO RETURN ADDRESS
5587 34 01 566B          7394        ST    R05DRB+3,XR1          .STORE RETURN ADDRESS
                         7395
558B 0C 01 5679 56E7     7396        MVC   R05DW1,R05ZER(2)      .MOVE IN ADDRESS FOR FSQ 1
5591 38 80 566E          7397        TBN   R05DFL,X'80'          .FSQ 1 DUMP?
5595 F2 10 20            7398        JT    R05DK1                 IF YES, EXIT.
5598 0E 01 5679 56E9     7399        ALC   R05DW1,R05100(2)      .MOVE IN ADDRESS FOR FSQ 2
559E 38 40 566E          7400        TBN   R05DFL,X'40'          .FSQ 2 DUMP?
55A2 F2 10 13            7401        JT    R05DK1                 IF YES, EXIT.
55A5 0E 01 5679 56E9     7402        ALC   R05DW1,R05100(2)      .MOVE IN ADDRESS FOR FSQ 3
55AB 38 20 566E          7403        TBN   R05DFL,X'20'          .FSQ 3 DUMP?
55AF F2 10 06            7404        JT    R05DK1                 IF YES, EXIT.
55B2 0E 01 5679 56E9     7405        ALC   R05DW1,R05100(2)      .MOVE IN ADDRESS FOR FSQ 4
55B8 38 08 566E          7406 R05DK1 TBN   R05DFL,X'08'          BEYOND 1ST FET?
55BC C0 90 55E2          7407        BF    R05DK9                BR IF NOT BEYOND
55C0 0E 01 5679 56F4     7408        ALC   R05DW1,X0400(2)       INCR FOR 1ST ADD, OF 2ND FET
55C6 38 04 566E          7409        TBN   R05DFL,X'04'          2ND FET?
55CA C0 10 55E2          7410        BT    R05DK9                BR IF 2ND FET
55CE 0E 01 5679 56F4     7411        ALC   R05DW1,X0400(2)       INCR FOR 1ST ADD, OF 3RD FET
55D4 38 02 566E          7412        TBN   R05DFL,X'02'          3RD FET?
55D8 C0 10 55E2          7413        BT    R05DK9                BR IF 3RD FET
55DC 0E 01 5679 56F4     7414        ALC   R05DW1,X0400(2)       INCR FOR 1ST ADD, OF 4TH FET
55E2 0C 01 5620 5675     7415 R05DK9 MVC   R05DUP,R05DAS         .MOVE IN START OF DUMP ADDRESS
55E8 C0 87 021A          7416        B     PRINT                 .GO PRINT HEADING
55EC 01                  55EC 7417   DC    XL1'01'
55ED 0A                  55ED 7418   DC    IL1'10'
55EE 56FE                55EF 7419   DC    AL2(R05HDG)
                         7420
55F0 0C 59 56D6 56D7     7421 R05DK2 MVC   R05P02,RCEP03(90)   .CLEAR PRINT FIELD
55F6 C0 87 021E          7422        B     UNPACK                .UNPACK CONTROL STORE ADDRESS
55FA 02                  55FA 7423   DC    IL1'02'
55FB 5679                55FC 7424   DC    AL2(R05DW1)
55FD 567D                55FE 7425   DC    AL2(R05P01)
55FF 0C 01 5700 5679     7426        MVC   R05DWK(2),R05DW1      .MOVE MIAR ADDR, TO MBAR WK SP.
5605 0E 01 5700 57C0     7427        ALC   R05DWK(2),R05DWK      .CONVERT TO MBAR ADDRESS
560B C0 87 021E          7428        B     UNPACK                .GO UNPACK MBAR ADDRESS
560F 02                  560F 7429   DC    IL1'02'
5610 5700                5611 7430   DC    AL2(R05DWK)
5612 5683                5613 7431   DC    AL2(R05POX)
                         7432
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

5614 0C 01 5622 56EE     7433        MVC   R05PX(2),R05PAD       .INSERT START ADDRESS
                         7434
561A C0 87 021E          7435 R05UNP B     UNPACK                .UNPACK 16 WORDS OF CONTROL STOR
561E 02                  561E 7436   DC    IL1'02'
561F 0000                5620 7437 R05DUP DC   AL2(*-*)
5621 56D6                5622 7438 R05PX  DC   AL2(R05P02)
                         7439
5623 0F 01 5620 5BE6     7440        SLC   R05DUP(2),X0002       .UPDATE UNPACK SOURCE ADDR.
5629 0F 01 5622 56F0     7441        SLC   R05PX(2),X0005        .UPDATE UNPACK DESTINATION ADDR.
562F 0D 01 5622 56EC     7442        CLC   R05PX(2),R05PAS       .TEST FOR END OF LINE
5635 C0 02 561A          7443        BNL   R05UNP                .UNPACK AGAIN IF NOT
                         7444
5639 C0 87 021A          7445        B     PRINT                 .PRINT 16 WORDS OF CONTROL STORE
563D 01                  563D 7446   DC    XL1'01'
563E 5D                  563E 7447   DC    IL1'93'
563F 56D6                5640 7448   DC    AL2(R05P02)
                         7449
5641 0E 01 5679 56EA     7450        ALC   R05DW1,R05010(2)      .INCREMENT CS ADDRESS BY 16
5647 0E 01 5620 56F2     7451        ALC   R05DUP,X0040(2)       .INCREMENT DUMP AREA
564D 0D 01 5620 5677     7452        CLC   R05DUP,R05EAE(2)      .AT END OF DUMP AREA?
5653 C0 04 55F0          7453        BNH   R05DK2                 IF NOT, GO DUMP NEXT 16 WORDS.
                         7454
5657 C0 87 021A          7455        B     PRINT                 .SPACE 6 LINES AFTER PRINT
565B 16                  565B 7456   DC    XL1'16'
565C 35 04 1738          7457        L     R05SPS,PSR            .RESTORE XR1, XR2, & PSR
5660 C2 01 0000          7458 R05DX1 LA    *-*,XR1
5664 C2 02 0000          7459 R05DX2 LA    *-*,XR2
5668 C0 87 0000          7460 R05DRB B     *-*                   .RETURN TO ROUTINE
566C 0000                566D 7461 R05DPS DC   XL2'0'
566E 00                  566E 7462 R05DFL DC   XL1'0'
566F 1C                  566F 7463 R05SF1 DC   XL1'10'
5670 0000                5671 7464 R05SIN DC   XL2'0'
5672 0000                5673 7465 R05R01 DC   XL2'0'
                         7466
                         7466
                         7466
5674 5720                5675 7467 R05DAS DC   AL2(R05W1E+31)     .START OF DUMP ADDRESS
5676 5900                5677 7468 R05DAE DC   AL2(R05W1E)       .END OF DUMP ADDRESS
5678 0000                5679 7469 R05DW1 DC   XL2'0'
567A 00000000            567D 7470 R05P01 DC   XL4'0'
567E 000000000000        5683 7471 R05POX DC   XL6'0'
5684 4040404040404040    56D6 7472 R05P02 DC   83XL1'40'
568C 4040404040404040    7472
569C 4040404040404040    7472
56AC 4040404040404040    7472
56BC 4040404040404040    7472
56CC 4040404040404040    7472
56DC 4040404040404040    7472
56EC 4040404040404040    7472
56FC 4040404040404040    7472
5704 404040              7472
5707 40                  56D7 7473 R05P03 DC   XL1'40'
5708 0001                56D9 7474 X0001  DC   XL2'0001'
56DA 00FF                56DB 7475 X00FF  DC   XL2'00FF'
56DC 01FF                56DD 7476 X01FF  DC   XL2'01FF'
56DE 02FF                56DF 7477 X02FF  DC   XL2'02FF'
56E0 03FF                56E1 7478 X03FF  DC   XL2'03FF'
56E2 07FF                56E3 7479 X07FF  DC   XL2'07FF'
56E4 0BFF                56E5 7480 X0BFF  DC   XL2'0BFF'
56E6 0000                56E7 7481 R05ZER DC   XL2'0000'       .+0000-
56E8 01                  56E8 7482 R05ONE DC   XL1'01'         .+0001-
56E9 00                  56E9 7483 R05100 DC   XL1'00'         .+0100-
56EA 10                  56EB 7484 R05010 DC   XL1'10'         .+0010-
56EB 5687                56EC 7485 R05PAS DC   AL2(R05P01+10)
56ED 56D6                56EE 7486 R05PAD DC   AL2(R05P02)
56EF 0005                56F0 7487 X0005  DC   XL2'0005'
56F1 0040                56F2 7488 X0040  DC   XL2'0040'
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   56F3 0400             56F4 7489 X0400  DC    XL2'0400'
   56F5 D4C9C1D94040D4C2 56FE 7490 R05MDG DC    CL10'MIAR  MBAR'
   56FD C1D9                  7490
   56FF 0000             5700 7491 R05DWK DC    XL2'0'                    .MBAR ADDRESS WORK SPACE
                         5701 7492 R05W1B EQU   *
   5701                  5900 7493 R05W1E DS    2XL256
                              7494
                              7495
                         0A0B 7496 OPTDEF EQU   X'0A0B'
                         0001 7497 STG2   EQU   X'01'
                              7498
   5901 D9D6E4E340F74 6D3 5917 7499 R1SST  DC    CL23'ROUT 7 LIO/SNS MC STORE'
   5909 C9D661E2D5E24 6D4
   5911 C340E2E3D6D9C5
                              7499
                              7500 ********************************************************************
                              7501 *       SUBROUTINE LOADCS                                          *
                              7502 ********************************************************************
                              7503 *       LOADS CONTROL STORE                                        *
                              7504 *                                                                  *
                              7505 *           LINKAGE TO SUBROUTINE:  B    LOADCS                  *
                              7506 *                                   DC   XL1'XX'     FLAG BYTE   *
                              7507 *                                1* DC   AL2(XXXXXX) BEGINNING ADDR*
                              7508 *                                1* DC   AL2(XXXXXX) END ADDRESS  *
                              7509 *                                5* DC   XL1'XX'     1K BLOCK BYTE*
                              7510 *                                                                  *
                              7511 *              FLAG BYTE:                                          *
                              7512 *                BIT                                               *
                              7513 *               4,3*  0    LOAD PROGRAM INTO CONTROL STORE ON A 256 *
                              7514 *                         BOUNDRY                                  *
                              7515 *                                                                  *
                              7516 *                 5*  1    USE 1K BLOCK BYTE                      *
                              7517 *                                                                  *
                              7518 *                 6*  2    32XX WILL NOT BE DISABLED UPON ENTRY INTO*
                              7519 *                         THE CONTROL STORE LOADING ROUTINE        *
                              7520 *                 4*  3    32XX WILL NOT BE DISABLED UPON EXIT FROM *
                              7521 *                         THE CONTROL STORE LOADING ROUTINE        *
                              7522 *                                                                  *
                              7523 *               3,2*  4    FILL 4-TH 256 BLOCK WITH BCS 0 (ON ADDRESS)*
                              7524 *                         (IF PRESENT)                             *
                              7525 *               3,2*  5    FILL 3-RD 256 BLOCK WITH BOS 0 (ON ADDRESS)*
                              7526 *                         (IF PRESENT)                             *
                              7527 *               3,2*  6    FILL 2-ND 256 BLOCK WITH BOS 0 (ON ADDRESS)*
                              7528 *                         (IF PRESENT)                             *
                              7529 *               3,2*  7    FILL 1-ST 256 BLOCK WITH BCS 0 (ON ADDRESS)*
                              7530 *                                                                  *
                              7531 *                1* NOTE - THESE PARAMETERS MUST BE ABSENT IF FLAG *
                              7532 *                          BIT 0 IS OFF                            *
                              7533 *                                                                  *
                              7534 *                2* NOTE - IF A BLOCK OF CONTROL STORE IS TO BE FILLED*
                              7535 *                          WITH BOS 0. THE PREVIOUS BLOCK OF 256 MUST*
                              7536 *                          ALSO BE FILLED, I.E. NO GAPS IN ADDRESSING*
                              7537 *                                                                  *
                              7538 *                3* NOTE - IF A PROGRAM IS TO BE LOADED STARTING AT*
                              7539 *                          THE BEGINNING OF A 256 BLOCK (-00- BOUNDRY)*
                              7540 *                          AND THE REST OF THAT BLOCK IS TO BE LOADED*
                              7541 *                          WITH BOS 0. THE APPROPRIATE BIT 4-7 SHOULD*
                              7542 *                          BE TURNED ON. IF MORE CONTROL STORE IS TO BE*
                              7543 *                          FILLED WITH BOS 0, SEE 2* NOTE.         *
                              7544 *                                                                  *
                              7545 *                4* NOTE - FLAG BITS 2&3 IN CONJUNCTION WITH BIT 0 CAN*
                              7546 *                          BE USED TO LOAD CONTROL STORE ONE 256 BLOCK*
                              7547 *                          AT A TIME IN SEQUENTIAL ORDER.          *
                              7548 *                             EXAMPLE USING ONLY THE FLAG BYTES:   *
                              7549 *                               1-ST ENTRY:  FLAG = DC XL1'91'     *
                              7550 *                               2-ND ENTRY:  FLAG = DC XL1'82'     *
                              7551 *                               3-RD ENTRY:  FLAG = DC XL1'84'     *
                              7552 *                               4-TH ENTRY:  FLAG = DC XL1'A8'     *
                              7553 *                                                                  *
```


8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              7554 *                    ENTER PROGRAM OF LESS THAN 256 INSTRUCTIONS.*
                              7555 *                       EXAMPLE USING ONLY THE FLAG BYTES:       *
                              7556 *                         1-ST ENTRY:  FLAG = DC XL1'93'         *
                              7557 *                         2-ND ENTRY:  FLAG = DC XL1'AC'         *
                              7558 *                    & ENTER PROGRAM BETWEEN 256-512 INSTRUCTIONS*
                              7559 *                       EXAMPLE USING ONLY THE FLAG BYTES:       *
                              7560 *                         1-ST ENTRY:  FLAG = DC XL1'92'         *
                              7561 *                         2-ND ENTRY:  FLAG = DC XL1'A8'         *
                              7562 *                                                                *
                              7563 *                5* NOTE - 1K BLOCK BYTE AND FLAG BIT 2 MUST EITHER*
                              7564 *                          BOTH BE PRESENT OR BOTH ABSENT.       *
                              7565 *              1K BLOCK BYTE                                     *
                              7566 *                 BIT                                            *
                              7567 *                  0    FLAG BITS 4,5,6,7 APPLY TO               *
                              7568 *                       4TH 1K BLOCK ALSO.                       *
                              7569 *                  1    FLAG BITS 4,5,6,7 APPLY TO               *
                              7570 *                       3RD 1K BLOCK ALSO.                       *
                              7571 *                  2    FLAG BITS 4,5,6,7 APPLY TO               *
                              7572 *                       2ND 1K BLOCK ALSO.                       *
                              7573 *                 3-7 RESERVED                                   *
                              7574 ********************************************************************
                              7575
                              7575
   599F                       7576         USING LIOCS,XR2
   5918 34 02 59FC            7577 LOADCS  ST    SAVXR2,XR2          .SAVE THE CONTENTS OF XR1 & XR2
   591C 34 08 5A00            7578         ST    SAVARR,ARR          .SAVE ADDRESS OF NEXT SEQ INSTR &
   5920 35 02 5A00            7579         L     SAVARR,XR2           LOAD IT INTO XR2
   5924 2C 04 5A07 04         7580         MVC   EADDR,4(5,XR2)      .ENTER LOADING FLAG, BADDR, & EADDR
   5929 C2 02 599F            7581         LA    LIOCS,XR2           .SET XR2 AS INDEXING POINTER
   592D B4 01 59              7582         ST    SAVXR1(,XR2),XR1
   5930 AE 01 61 6C           7583         ALC   SAVARR(,XR2),WUN(2,XR2) .INCR RET ADDR TO BYPASS FLAG BYTE
   5934 B8 80 64              7584         TBN   LFLAG(,XR2),X'80'     .IF PROGRAM IS TO BE LOADED INTO C.S.
   5937 F2 90 0F              7585         JF    TSTB2                  INCREMENT RETURN POINTER & DETERMINE
   593A AE 01 61 72           7586         ALC   SAVARR(,XR2),FOUR(2,XR2)    # OF BYTES TO TRANSFER, IF NOT,
   593E B5 01 66              7587         L     BADDR(,XR2),XR1          BYPASS THIS AREA
   5941 AF 01 68 66           7588         SLC   EADDR(,XR2),BADDR(2,XR2) .DETERMINE NUMBER OF DATA BYTES
                              7589 *                                       TO BE ENTERED INTO CONTROL STORE &
   5945 AE 01 68 6C           7590         ALC   EADDR(,XR2),WUN(2,XR2) CHECK TO SEE IF AN EVEN NUMBER OF
                              7591
   5949 3C 00 5A40            7592 TSTB2   MVI   STG1K,X'00'                ZERO OUT STG1K FLAG
   594D B8 40 64              7593         TBN   LFLAG(,XR2),X'40'
   5950 C0 90 5964            7594         BF    SKIP1K
   5954 0C 01 595F 5AC0       7595         MVC   GET1KB+5(2),SAVARR
   595A 0C 00 5A4D 595A       7596 GET1KB  MVC   STG1K(1),*
   5960 AE 01 61 6C           7597         ALC   SAVARR(,XR2),WUN(2,XR2)
   5964 B8 20 64              7598 SKIP1K  TBN   LFLAG(,XR2),X'20'      CHECK IF ATT. IS TO BE DISABLED
   5967 F2 10 0A              7599         JT    TSTSSW                ENABLED ON ENTRY INTO LOAD RTN.
   596A F3 58 80              7600 LCSDIS  SIO   X'80',SIOI               IF YES, DISABLE ATTCHMENT
   596D F3 58 C0              7601 LCSENA  SIO   X'C0',SIOI              ENABLE ATTCH. RESET CONTR ST WD
   5970 AC 01 63 6B           7602         MVC   CSWORD(,XR2),X5000(2,XR2)  COUNT TO ZERO. IF NOT, BYPASS.
                              7603
   5974 38 40 0208            7604 TSTSSW  TBN   SBYTE0,X'40'            .TEST SSW01 (LOOP ROUTINE) ON
   5978 F2 90 14              7605         JF    TSTRST                 .JUMP IF NOT
   597B 38 01 020A            7606         TBN   SBYTE2,SSW17           .TEST SSW 17 ON
   597F F2 90 0D              7607         JF    TSTRST                 .JUMP IF NOT
   5982 6D 00 69 0A03         7608         CLC   CSLD(1,XR2),PRTN       .TEST C.S. LOADED FOR ROUTINE
   5987 F2 81 51              7609         JE    ENDFIL                 .JUMP IF CONT. STG. LOADED
   598A 8C 00 69 0A03         7610         MVC   CSLD(1,XR2),PRTN       .MOVE IN THIS RTN. NO.
                              7611
   598F B9 60 64              7612 TSTRST  TBF   LFLAG(,XR2),X'60'       .TEST FLAG BYTE
   5992 F2 90 04              7613         JF    TSTB0                  .DON'T LOAD OP DEC IF EITHER ON
   5995 C0 87 5D38            7614         B     LOOP                   .GO LOAD OP DECODE REGS
   5999 B8 80 64              7615 TSTB0   TBN   LFLAG(,XR2),X'80'   .IF NO PROGRAM TO BE LOADED GO AND
   599C F2 90 11              7616         JF    FILLCS                FILL CONTROL STORE WITH BOS 0
                              7617
   599F 71 58 01              7618 LIOCS   LIO   1(,XR1),CTSTOR           .LOAD TWO BYTES OF CONTROL STORE
   59A2 D2 01 02              7619         LA    2(,XR1),XR1          .INCREMENT POINTER TO NEXT CS WORD
   59A5 AE 01 63 6C           7620         ALC   CSWORD(,XR2),WUN(2,XR2)  .INCR  COUNTER TO NEXT CS WORD
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   59A9 AF 01 68 6F           7621         SLC   EADDR(*,XR2),TWO(2,XR2) .DECREMENT DATA BYTE COUNTER.IF ALL
   59AD E0 01 00              7622         BNZ   LIOCS(*,XR2)             DATA NOT TRANSFERRED, REPEAT.
                              7623
   59B0 AD 01 63 6E           7624 FILLCS  CLC   CSWORD(*,XR2),X5100(2,XR2) .LESS THAN 256 WORDS IN CS?
   59B4 F2 02 97              7625         JNL   BLOCK2                    IF NOT, GO TO NEXT CHECK.
   59B7 B8 01 64              7626         TBN   LFLAG(*,XR2),X'01'        .IS 'FILL TO END OF 1-ST BLOCK' FLAG
   59BA E0 90 3C              7627         BF    ENDFIL(*,XR2)             ON? IF NOT, BYPASS FILL.
   59BD C0 87 59C1            7628         B     FILLFF
                              7629
                              7630
   59C1 0C 01 5A4C 5A42       7631 FILLFF  MVC   BOSADR(2),CSWORD
   59C7 3B 0C 5A48            7632         SBF   BCSADR-1,X'0C'
   59CB B1 58 AD              7633         LIO   BOSADR(*,XR2),CTSTOR      .LOAD CTRL STORE WITH BOS 0 (ON
   59CE AE 01 63 6C           7634         ALC   CSWORD(*,XR2),WUN(2,XR2)  ADDRESS) TO A 256 BLOCK BOUNDRY.
   59D2 B9 FF 63              7635         TBF   CSWORD(*,XR2),X'FF'
   59D5 E0 90 22              7636         BF    FILLFF(*,XR2)
   59D8 E0 87 11              7637         B     FILLCS(*,XR2)
                              7638
   59DB B8 10 64              7639 ENDFIL  TBN   LFLAG(*,XR2),X'10'    .CHECK IF ATTACH. IS TO BE DISABLED/
   59DE F2 10 0A              7640         JT    RESTR                 ENABLED UPON EXIT FROM THE LOADER.
   59E1 F3 58 80              7641         SIO   X'80',SIOI             IF YES, DISAB/ENAB ATTACH. & RESET
   59E4 F3 58 C0              7642         SIO   X'C0',SIOI             THE CONTROL STORE WORD COUNT.  IF
   59E7 AC 01 63 6B           7643         MVC   CSWORD(*,XR2),X5000(2,XR2) NOT, RESTORE XR1 & XR2.
                              7644
   59EB 38 01 020A            7645 RESTR   TBN   SBYTE2,SSW17                .TEST SSW 17 ON
   59EF F2 10 03              7646         JT    RESTOR                    .SKIP NEXT INSTRUCTION IF SO
   59F2 BC 00 69              7647         MVI   CSLD(*,XR2),0             .CLEAR CONT. STG. LOADED FLAG
   59F5 C2 01 0000            7648 RESTOR  LA    *-*,XR1                 .RESTORE XR1,XR2, & AND RETURN TO
   59F9 C2 02 0000            7649         LA    *-*,XR2                   CALLING ROUTINE.
   59FD C0 87 0000            7650 RETBR   B     *-*
                              7651
                              7651
                              7652 ************************************
                              7653 * PROGRAM DEFINITIONS AND CONSTANTS ************************************
                              7654 ************************************
                              7655
   5A01 5000                  5A02 7656 CSWORD DC    XL2'5000'
   5A03 00                    5A03 7657 LFLAG  DC    XL1'0'       |
   5A04 0000                  5A05 7658 BADDR  DC    XL2'0'       |  THESE MUST BE TOGETHER
   5A06 0000                  5A07 7659 EADDR  DC    XL2'0'       |
   5A08 00                    5A08 7660 CSLD   DC    XL1'0'                .CONTROL STORE LOADED FLAG
                              7661
                              7661
   5A09 5000                  5A0A 7662 X5000  DC    XL2'5000'      X'5000'     ||
   5A0B 01                    5A0B 7663 WUN    DC    XL1'01'        X'0001'     ||
   5A0C 5100                  5A0D 7664 X5100  DC    XL2'5100'      X'5100'     ||
   5A0E 02                    5A0E 7665 TWO    DC    XL1'02'        X'0002'     || THESE MUST BE TOGETHER
   5A0F 5200                  5A10 7666 X5200  DC    XL2'5200'      X'5200'     ||
   5A11 04                    5A11 7667 FOUR   DC    XL1'04'        X'0004'     ||
   5A12 5300                  5A13 7668 X5300  DC    XL2'5300'      X'5300'
   5A14 5400                  5A15 7669 X5400  DC    XL2'5400'      X'5400'
   5A16 5500                  5A17 7670 X5500  DC    XL2'5500'
   5A18 5600                  5A19 7671 X5600  DC    XL2'5600'
   5A1A 5700                  5A1B 7672 X5700  DC    XL2'5700'
   5A1C 5800                  5A1D 7673 X5800  DC    XL2'5800'
   5A1E 5900                  5A1F 7674 X5900  DC    XL2'5900'
   5A20 5A00                  5A21 7675 X5A00  DC    XL2'5A00'
   5A22 5B00                  5A23 7676 X5B00  DC    XL2'5B00'
   5A24 5C00                  5A25 7677 X5C00  DC    XL2'5C00'
   5A26 5D00                  5A27 7678 X5D00  DC    XL2'5D00'
   5A28 5E00                  5A29 7679 X5E00  DC    XL2'5E00'
   5A2A 5F00                  5A2B 7680 X5F00  DC    XL2'5F00'
   5A2C 6000                  5A2D 7681 X6000  DC    XL2'6000'
   5A2E D9D6E4E340E7E740      5A38 7682 MICOP  DC    CL11'ROUT XX XXX'
   5A36 E7E7E7                     7682
   5A39 40D4C9C3D9D640D6      5A46 7683 MICPRT DC    CL14' MICRO OP TEST'
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8912 DISPLAY ADAPTER TEST

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   5A41 D740E3C5E2E3          7683
   5A47 1E047900              5A4A 7684 INSWR  DC    XL4'1E047900'           .CONSTANT FOR SETTING UP
                              7685 *                                         INSIDE WRAPS (NO LINE SEL.)
   5A48 0000                  5A4C 7686 BOSADR DC    XL2'00'
   5A4D 00                    5A4D 7687 STG1K  DC    XL1'00'
                              7688
                              7688
                              7688
   5A4E AD 01 63 71           7689 BLOCK2  CLC   CSWORD(*,XR2),X5200(2,XR2) .LESS THAN 512 WORDS IN CS?
   5A52 F2 02 0A              7690         JNL   BLOCK3                    IF NOT, GO TO NEXT CHECK.
   5A55 B8 02 64              7691         TBN   LFLAG(*,XR2),X'02'        .IS 'FILL TO END OF 2-ND BLOCK' FLAG
   5A58 E0 90 3C              7692         BF    ENDFIL(*,XR2)             ON?  IF NOT, BYPASS FILL.
   5A5B C0 87 59C1            7693         B     FILLFF
                              7694
   5A5F AD 01 63 74           7695 BLOCK3  CLC   CSWORD(*,XR2),X5300(2,XR2) .LESS THAN 768 WORDS IN CS?
   5A63 F2 02 0A              7696         JNL   BLOCK4                    IF NOT, GO TO NEXT CHECK.
   5A66 B8 04 64              7697         TBN   LFLAG(*,XR2),X'04'        .IS 'FILL TO END OF 3-RD BLOCK' FLAG
   5A69 E0 90 3C              7698         BF    ENDFIL(*,XR2)             ON? IF NOT, BYPASS FILL.
   5A6C C0 87 59C1            7699         B     FILLFF
                              7700
   5A70 AD 01 63 76           7701 BLOCK4  CLC   CSWORD(*,XR2),X5400(2,XR2) .LESS THAN 1024 WORDS IN CS?
   5A74 F2 02 0A              7702         JNL   BLOCK5                    IF NOT, TERMINATE LOADING.
   5A77 B8 08 64              7703         TBN   LFLAG(*,XR2),X'08'        .IS 'FILL TO END OF 4-TH BLOCK' FLAG
   5A7A E0 90 3C              7704         BF    ENDFIL(*,XR2)             ON? IF NOT, BYPASS FILL.
   5A7D C0 87 59C1            7705         B     FILLFF
                              7706
   5A81 38 20 5A4D            7707 BLOCK5  TBN   STG1K,X'20'                SHOULD SECOND FET BE LOADED?
   5A85 C0 90 5AD1            7708         BF    BLOCK9                    BR IF NOT
   5A89 AD 01 63 78           7709         CLC   CSWORD(*,XR2),X5500(2,XR2)  LESS THAN 1280 WDS IN CS?
   5A8D F2 02 0B              7710         JNL   BLOCK6                    BR IF NOT
   5A90 B8 01 64              7711         TBN   LFLAG(*,XR2),X'01'        IS'FILL TO ENDOF 1ST BLOCK'ON?
   5A93 C0 90 59DB            7712         BF    ENDFIL                    BR IF NOT
   5A97 C0 87 59C1            7713         B     FILLFF
                              7714
   5A9B AD 01 63 7A           7715 BLOCK6  CLC   CSWORD(*,XR2),X5600(2,XR2)  LESS THAN 1536 WDS IN CS?
   5A9F F2 02 0B              7716         JNL   BLOCK7                    BR IF NOT
   5AA2 B8 02 64              7717         TBN   LFLAG(*,XR2),X'02'        IS'FILL TO END OF 2ND BLOCK'ON?
   5AA5 C0 90 59DB            7718         BF    ENDFIL                    BR IF NOT
   5AA9 C0 87 59C1            7719         B     FILLFF
                              7720
   5AAD AD 01 63 7C           7721 BLOCK7  CLC   CSWORD(*,XR2),X5700(2,XR2)  LESS THAN 1792 WDS IN CS?
   5AB1 F2 02 0B              7722         JNL   BLOCK8                    BR IF NOT
   5AB4 B8 04 64              7723         TBN   LFLAG(*,XR2),X'04'        IS'FILL TO END OF 3RD BLOCK'ON?
   5AB7 C0 90 59DB            7724         BF    ENDFIL                    BR IF NOT
   5ABB C0 87 59C1            7725         B     FILLFF
                              7726
   5ABF AD 01 63 7E           7727 BLOCK8  CLC   CSWORD(*,XR2),X5800(2,XR2)  LESS THAN 2048 WDS IN CS?
   5AC3 F2 02 0B              7728         JNL   BLOCK9                    BR IF NOT
   5AC6 B8 08 64              7729         TBN   LFLAG(*,XR2),X'08'        IS'FILL TO END OF 4TH BLOCK'ON?
   5AC9 C0 90 59DB            7730         BF    ENDFIL                    BR IF NOT
   5ACD C0 87 59C1            7731         B     FILLFF
                              7732
   5AD1 38 40 5A4D            7733 BLOCK9  TBN   STG1K,X'40'                SHOULD 3RD FET BE LOADED?
   5AD5 C0 90 5B21            7734         BF    BLOK13                    BR IF NOT
   5AD9 AD 01 63 80           7735         CLC   CSWORD(*,XR2),X5900(2,XR2)  LESS THAN 2304 WDS IN CS?
   5ADD F2 02 0B              7736         JNL   BLOK10                    BR IF NOT
   5AE0 B8 01 64              7737         TBN   LFLAG(*,XR2),X'01'        IS'FILL TO END OF 1ST BLOCK'ON?
   5AE3 C0 90 59DB            7738         BF    ENDFIL                    BR IF NOT
   5AE7 C0 87 59C1            7739         B     FILLFF
                              7740
   5AEB AD 01 63 82           7741 BLOK10  CLC   CSWORD(*,XR2),X5A00(2,XR2)  LESS THAN 2560 WDS IN CS?
   5AEF F2 02 0B              7742         JNL   BLOK11                    BR IF NOT
   5AF2 B8 02 64              7743         TBN   LFLAG(*,XR2),X'02'        IS'FILL TO END OF 2ND BLOCK'ON?
   5AF5 C0 90 59DB            7744         BF    ENDFIL                    BR IF NOT
   5AF9 C0 87 59C1            7745         B     FILLFF
                              7746
   5AFD AD 01 63 84           7747 BLOK11  CLC   CSWORD(*,XR2),X5B00(2,XR2)  LESS THAN 2816 WDS IN CS?
   5B01 F2 02 0B              7748         JNL   BLOK12                    BR IF NOT
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   5804 B8 04 64          7749          TBN   LFLAG(.XR2).X'04'        IS'FILL TO END OF 3RD BLOCK'ON?
   5807 C0 90 59D8        7750          BF    ENDFIL                   BR IF NOT
   5808 C0 87 59C1        7751          B     FILLFF
                          7752
   580F AD 01 63 86       7753 BLCK12   CLC   CSWORD(.XR2).X5C00(2.XR2)  LESS THAN 3072 WDS IN CS?
   5813 F2 02 0B          7754          JNL   BLOK13                   BR IF NOT
   5E16 B8 08 64          7755          TBN   LFLAG(.XR2).X'08'        ID'FILL TO END OF 4TH BLOCK'ON?
   5819 C0 90 59D8        7756          BF    ENDFIL                   BR IF NOT
   581D C0 87 59C1        7757          B     FILLFF
                          7758
   5821 38 80 5A4D        7759 BLCK13   TBN   STG1K.X'80'              SHOULD 4TH FET BE LOADED?
   5E25 C0 90 59DB        7760          BF    ENDFIL                   BR IF NOT
   5829 AD 01 63 88       7761          CLC   CSWORD(.XR2).X5D00(2.XR2)  LESS THAN3328 WDS IN CS?
   582D F2 02 0B          7762          JNL   BLOK14                   BR IF NOT
   5E30 B8 01 64          7763          TBN   LFLAG(.XR2).X'01'        IS'FILL TC END OF 1ST BLOCK'ON?
   5833 C0 90 59DB        7764          BF    ENDFIL                   BR IF NOT
   5837 C0 87 59C1        7765          B     FILLFF
                          7766
   583B AD 01 63 8A       7767 BLCK14   CLC   CSWORD(.XR2).X5E00(2.XR2)  LESS THAN 3584 WDS IN CS?
   583F F2 02 0B          7768          JNL   BLOK15                   BR IF NOT
   5E42 B8 02 64          7769          TBN   LFLAG(.XR2).X'02'        IS'FILL TO END OF 2ND BLOCK'ON?
   5B45 C0 90 59DB        7770          BF    ENDFIL                   BR IF NOT
   5E49 C0 87 59C1        7771          B     FILLFF
                          7772
   584D AD 01 63 8C       7773 BLOK15   CLC   CSWORD(.XR2).X5F00(2.XR2)  LESS THAN 3840 WDS IN CS?
   5851 F2 02 0B          7774          JNL   BLOK16                   BR IF NOT
   5854 B8 04 64          7775          TBN   LFLAG(.XR2).X'04'        IS'FILL TO END OF 3RD BLOCK'ON?
   5857 C0 90 59DB        7776          BF    ENDFIL                   BR IF NOT
   585B C0 87 59C1        7777          B     FILLFF
                          7778
   585F AD 01 63 8E       7779 BLOK16   CLC   CSWORD(.XR2).X6000(2.XR2)  LESS THAN 4096 WDS IN CS?
   5863 C0 02 59DB        7780          BNL   ENDFIL                   BR IF NOT
   5867 B8 08 64          7781          TBN   LFLAG(.XR2).X'08'        IS'FILL TO END OF 4TH BLOCK'ON?
   586A C0 90 59DB        7782          BF    ENDFIL                   BR IF NOT
   586E C0 87 59C1        7783          B     FILLFF
                          7784 ********************************************************************
                          7785 *       SUBROUTINE PRINTM                                          *
                          7786 ********************************************************************
                          7787 *       COMMON SUBROUTINE FOR ALL RCUTINE TO PROVIDE ERROR PRINTOUT.  *
                          7788 *       LINKAGE TO PRINTOUT IS:      B     PRINTM                  *
                          7789 *                                    DC    XL1'ID'   WHERE ID IS ERROR  *
                          7790 *                                    DC    XL1'XX'   WHERE XX IS LENGTH *
                          7791 *                                    DC    AL2(M)    WHERE M IS MSG ADDR*
                          7792 ********************************************************************
   5872 34 08 58E4        7793 PRINTM   ST    PM5+3.ARR                .SAVE ARR
   5876 34 01 58E0        7794          ST    PXR1+3.XR1               .SAVE XR1
   587A 35 01 58E4        7795          L     PM5+3.XR1                .LOAD HALT CODE PARAMETER ADDR
   587E 0E 01 58E4 5A11   7796          ALC   PM5+3(2).FOUR            .POINT TO CORRECT RETURN ADDR
   5884 1C 00 589C 00     7797 P1       MVC   PM3(1).0(.XR1)           .INSERT ERROR ID IN PRINTOUT
   5889 1C 00 58D8 00     7798          MVC   PM4(1).0(.XR1)           .INSERT ERROR ID INTO ERR HALT
   588E 1C 02 589A 03     7799          MVC   PM3-2.3(3.XR1)           .MOVE IN LNGTH AND MESG. ADDR.
                          7800
   5893 C0 87 021A        7801          B     PRINT                    .PRINT ERROR MESSAGE
   5897 C2                5897 7802     DC    XL1'C2'
   5898 00                5898 7803     DC    IL1'00'                  .LENGTH FILLED IN
   5899 0000              589A 7804     DC    XL2'0000'                .ADDRESS FILLED IN
   589B 1400              589C 7805 PM3 DC    XL2'1400'
   589D 1C 00 65F2 00     7806          MVC   ERRHLT(1).0(.XR1)        .MOVE IN ERROR HALT
   58A2 0C 00 65F1 0AC3   7807          MVC   ERRRTN(1).PRTN           .MOVE IN ROUTINE NO.
   58A8 C2 01 6511        7808          LA    MTABLE.XR1               .INSERT ADDRESS OF TABLE
   58AC 1D 01 589A 00     7809 LOOK     CLC   PM3-2.0(2.XR1)           .SEARCH TABLE FOR MESSAGE
   58B1 F2 81 07          7810          JE    MFIND                    .JUMP IF FOUND
   58B4 D2 01 04          7811          LA    4(.XR1).XR1              .INCREMENT TO NEXT MSG.
   58B7 C0 87 58AC        7812          B     LOOK                     .GO LOOK AGAIN
   58BB 1C 01 58C5 02     7813 MFIND    MVC   MVLG+5.2(2.XR1)          .INSERT MSG. ADDR.
   58C0 0C 09 6601 00C0   7814 MVLG     MVC   ERRLOG(10).*-*           .MOVE IN LOG OUT MSG.
   58C6 C1 5D 621B        7815          TIO   PCHK.ATTCHK              .IF ATT. CHK. PRINT TYPES
   58CA C0 87 63FE        7816          B     ELPO                     .GO PRINT ERROR LOG
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   58CE C0 87 021A        7817          B     PRINT                    .SPACE 6
   58D2 96                7818          DC    XL1'96'
   58D3 C0 87 0222        7819          B     HALT                     .ERROR HALT
   58D7 1400              7820 PM4      DC    XL2'1400'
   58D9 C0 87 0216        7821          B     LINK                     .EXIT ROUTINE
                          7822
   58DD C2 01 0000        7823 PXR1     LA    *-*.XR1                  .RESTORE XR1
   58E1 C0 87 0000        7824 PM5      B     *-*                      .RETURN TO MAIN PROGRAM
                          7825
   58E5 0002              7826 X0002    DC    XL2'0002'
                          7827
                          7828 ********************************************************************
                          7829 * HDBH - HDBL *                                                    *
                          7830 ***************  SUBROUTINE LISTS CONTENTS OF SELECTED HDB'S       *
                          7831 *                CALL SUBROUTINE BY -                              *
                          7832 *                                    B     HDBH  LISTS HI HDB'S   *
                          7833 *                                                                  *
                          7834 *                                    B     HDBL  LISTS LO HDB'S   *
                          7835 *                                                                  *
                          7836 ********************************************************************
                          7837
   58E7 34 08 5C78        7838 HDBH     ST    SARR+3.ARR               .SAVE RETURN ADDRESS
   58EB 34 01 5C70        7839          ST    SXR1+3.XR1               .SAVE XR1
   58EF C2 01 5CF4        7840          LA    HDNGA.XR1                .LOAD HI HDB HEADING ADDRESS
   58F3 F3 58 C0          7841          SIO   X'C0'.SIOI               .ENABLE ATTACHMENT
   58F6 F2 87 0F          7842          J     STHD                     .GO STORE HEADING ADDRESS
                          7843
   58F9 34 08 5C78        7844 HDBL     ST    SARR+3.ARR               .SAVE RETURN ADDRESS
   58FD 34 01 5C70        7845          ST    SXR1+3.XR1               .SAVE XR1
   5C01 C2 01 5CBE        7846          LA    HDNG.XR1                 .LOAD LO HDB HEADING ADDRESS
   5C05 F3 58 80          7847          SIO   X'80'.SIOI               .DISABLE ATTACHMENT
   5C08 34 01 5C3B        7848 STHD     ST    HDADR.XR1                .PUT ADDRESS IN PRINT COMMAND
                          7849
   5C0C 30 48 5C7A        7850          SNS   HD1.HDB0                 STORE ALL 16 HDB'S
   5C10 30 49 5C7C        7851          SNS   HD2.HDB1
   5C14 30 4A 5C7E        7852          SNS   HD3.HDB2
   5C18 30 4B 5C80        7853          SNS   HD4.HDB3
   5C1C 30 4C 5C82        7854          SNS   HD5.HDB4
   5C20 30 4D 5C84        7855          SNS   HD6.HDB5
   5C24 30 4E 5C86        7856          SNS   HD7.HDB6
   5C28 30 4F 5C88        7857          SNS   HD8.HDB7
                          7858
   5C2C C0 87 021A        7859          B     PRINT                    .PRINT HDB'S HEADINGS.
   5C30 81                7860          DC    XL1'81'
   5C31 0C                7861          DC    IL1'12'
   5C32 5D37              7862          DC    AL2(HDNGMA)
   5C34 C0 87 021A        7863          B     PRINT
   5C38 81                7864          DC    XL1'81'
   5C39 36                7865          DC    IL1'54'
   5C3A 5CBE              7866 HDADR    DC    AL2(HDNG)
                          7867
   5C3C C2 01 5CFD        7868          LA    HDNGB-45.XR1             .XR1 = 1ST HDB POSITION
   5C40 C2 02 5C79        7869          LA    HD1-1.XR2                .XR2 = 1ST HDB DATA
                          7870
   5C44 34 01 5C54        7871 AGAIN    ST    RY1.XR1                  .STORE UNPACK DEST. ADDR
   5C48 34 02 5C52        7872          ST    RY2.XR2                  .STORE UNPACK SOURCE ADDR
   5C4C C0 87 021E        7873          B     UNPACK                   .GO UNPACK ONE HDB
   5C50 01                7874          DC    XL1'01'
   5C51 0000              7875 RY2      DC    AL2(*-*)                 .SOURCE ADDRESS GETS FILLED IN
   5C53 0000              7876 RY1      DC    AL2(*-*)                 .DEST. ADDRESS GETS FILLED IN
                          7877
   5C55 E2 02 01          7878          LA    1(.XR2).XR2              .INCREMENT DATA ADDRESS
   5C58 7D FF 01          7879          CLI   1(.XR1).X'FF'            .TEST FOR END
   5C5B F2 81 07          7880          JE    DOHIS                    .JUMP IF SO
   5C5E D2 01 03          7881          LA    3(.XR1).XR1              .NOT END, INCR. XR1 TO NEXT ADDR
   5C61 C0 87 5C44        7882          B     AGAIN                    .LOOP
                          7883
   5C65 C0 87 021A        7884 DOHIS    B     PRINT                    .GO PRINT HDB'S
```

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    5C69 86               5C69 7885        DC     XL1'86'
    5C6A 36               5C6A 7886        DC     IL1'54'
    5C6B 5D2A             5C6C 7887        DC     AL2(HDNGB)
    5C6D C2 01 0000            7888 SXR1   LA     *-*,XR1                          .RESTORE ALL REGS AND RETURN.
    5C71 C2 02 0000            7889 SXR2   LA     *-*,XR2
    5C75 C0 87 0000            7890 SARR   B      *-*
                               7891
    5C79 0000             5C7A 7892 HD1    DC     XL2'0000'
    5C7B 0000             5C7C 7893 HD2    DC     XL2'0000'
    5C7D 0000             5C7E 7894 HD3    DC     XL2'0000'
    5C7F 0000             5C80 7895 HD4    DC     XL2'0000'
    5C81 0000             5C82 7896 HD5    DC     XL2'0000'
    5C83 0000             5C84 7897 HD6    DC     XL2'0000'
    5C85 0000             5C86 7898 HD7    DC     XL2'0000'
    5C87 0000             5C88 7899 HD8    DC     XL2'0000'
    5C89 C1C4C4D9406040   5C8F 7900        DC     CL7'ADDR - '
    5C90 F0F040F0F140F0F2 5CBE 7901 HDNG   DC     CL47'00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F'
    5C98 40F0F340F0F440F0      7901
    5CA0 F540F0F640F0F740      7901
    5CA8 F0F840F0F940F0C1      7901
    5CB0 40F0C240F0C340F0      7901
    5CB8 C440F0C540F0C6        7901
    5CBF C1C4C4D9406040   5CC5 7902        DC     CL7'ADDR - '
    5CC6 F1F040F1F140F1F2 5CF4 7903 HDNGA  DC     CL47'10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F'
    5CCE 40F1F340F1F440F1      7903
    5CD6 F540F1F640F1F740      7903
    5CDE F1F840F1F940F1C1      7903
    5CE6 40F1C240F1C340F1      7903
    5CEE C440F1C540F1C6        7903
    5CF5 C4C1E3C1406040   5CFB 7904        DC     CL7'DATA - '
    5CFC E7E740E7E740E7E7 5D2A 7905 HDNGB  DC     CL47'XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX'
    5D04 40E7E740E7E740E7      7905
    5D0C E740E7E740E7E740      7905
    5D14 E7E740E7E740E7E7      7905
    5D1C 40E7E740E7E740E7      7905
    5D24 E740E7E740E7E7        7905
    5D2B FF               5D2B 7906        DC     XL1'FF'
    5D2C C8C4C240C3D6D5E3 5D37 7907 HDNGMA DC     CL12'HDB CONTENTS'
    5D34 C5D5E3E2              7907
                               7908
                               7909 *********************
                               7910 * SUBROUTINE LOADOP  ******************************************************
                               7911 *********************
                               7912 *      LOOP   - LOADS 32 OP-DEC REGS WITH OP CODES                         *
                               7913 ************************************************************************
                               7914
    5D38 34 08 5D61            7915 LOCP   ST     LOAD2+3,ARR                      SAVE RETURN ADDRESS
    5D3C 34 01 5D5D            7916        ST     XXR1+3,XR1                       .SAVE XR1
    5D40 C2 01 5D63            7917        LA     TABLOP,XR1                       .SET UP TABLE ADDRESS
    5D44 F3 58 80              7918        SIO    X'80',SIOI                       .DISABLE ATTACHMENT
    5D47 71 59 00              7919 LOAD1  LIO    0(,XR1),CPDEC                    LOAD OP-DE.ODE REG
    5D4A 7D FF 01              7920        CLI    1(,XR1),X'FF'                    .LAST ENTRY?
    5D4D D2 01 02              7921        LA     2(,XR1),XR1                      .INCREMENT TABLE POINTER
    5D50 C0 01 5D47            7922        BNE    LOAD1                            .RELOOP IF NOT COMPLETED
    5D54 F3 58 80              7923        SIO    X'80',SIOI                       DISABLE ATTACHMENT
    5D57 F3 58 C0              7924        SIO    X'C0',SIOI                       ENABLE ATTACHMENT
    5D5A C2 01 0000            7925 XXR1   LA     *-*,XR1                          .RESTORE XR1
    5D5E C0 87 0000            7926 LOAD2  B      *-*                              .RETURN TO MAIN PROGRAM
                               7927
    5D62 9210             5D63 7928 TABLOP DC     XL2'9210'                        .TABLE OF MICROPROCESSOR OP CODE
    5D64 2911             5D65 7929        DC     XL2'2911'
    5D66 9212             5D67 7930        DC     XL2'9212'
    5D68 1613             5D69 7931        DC     XL2'1613'
    5D6A 1414             5D6B 7932        DC     XL2'1414'
    5D6C 1415             5D6D 7933 X1415  DC     XL2'1415'
    5D6E B016             5D6F 7934        DC     XL2'B016'
    5D70 9017             5D71 7935        DC     XL2'9017'
    5D72 4318             5D73 7936        DC     XL2'4318'
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    5D74 1419             5D75 7937        DC     XL2'1419'
    5D76 F31A             5D77 7938        DC     XL2'F31A'
    5D78 731B             5D79 7939        DC     XL2'731B'
    5D7A E11C             5D7B 7940        DC     XL2'E11C'
    5D7C 941D             5D7D 7941        DC     XL2'941D'
    5D7E 711E             5D7F 7942        DC     XL2'711E'
    5D80 511F             5D81 7943        DC     XL2'511F'
    5D82 2200             5D83 7944 X2200  DC     XL2'2200'
    5D84 2201             5D85 7945        DC     XL2'2201'
    5D86 2202             5D87 7946        DC     XL2'2202'
    5D88 2203             5D89 7947        DC     XL2'2203'
    5D8A 2204             5D8B 7948        DC     XL2'2204'
    5D8C 2205             5D8D 7949 X2205  DC     XL2'2205'
    5D8E 2206             5D8F 7950        DC     XL2'2206'
    5D90 2207             5D91 7951        DC     XL2'2207'
    5D92 2208             5D93 7952        DC     XL2'2208'
    5D94 2209             5D95 7953        DC     XL2'2209'
    5D96 220A             5D97 7954        DC     XL2'220A'
    5D98 220B             5D99 7955        DC     XL2'220B'
    5D9A 220C             5D9B 7956        DC     XL2'220C'
    5D9C 220D             5D9D 7957        DC     XL2'220D'
    5D9E 220E             5D9F 7958        DC     XL2'220E'
    5DA0 220F             5DA1 7959        DC     XL2'220F'
    5DA2 FF               5DA2 7960        DC     XL1'FF'                          .END
    5DA3 5000             5DA4 7961 BRUO   DC     XL2'5000'
                               7962
                               7963 ************************************************************************
                               7964 * SUBROUTINE STATUS *                                                  *
                               7965 ********************                                                   *
                               7966 *      PURPOSE OF SUBROUTINE IS TO PRINT THE EXPECTED AND ACTUAL       *
                               7967 *      DATA AFTER AN OPEATION AND HALT. THIS IS AN ERROR PRINTOUT.     *
                               7968 *      ON -HALT RESET- PROGRAM RETURNS TO NEXT SEQUENTIAL INSTRUCTION.*
                               7969 *                                                                     *
                               7970 *      LINKAGE:                                                       *
                               7971 *      B      STATUS                                                  *
                               7972 *      DC     XL1'XX'                      .FLAG BYTE                 *
                               7973 *                                                                     *
                               7974 * FLAG BYTE OPTIONS                                                   *
                               7975 *             BIT 0, MASK -80- PRINT 'HDB ADDR, EXP AND ACT DATA      *
                               7976 *             BIT 1, MASK -40- PRINT 'CS ADDR, EXP & ACTUAL DATA'     *
                               7977 *             BIT 1,2     -60- PRINT 'CS ADDR & EXP DATA'             *
                               7978 *             BIT 2, MASK -20- PRINT 'EXP DATA & ACT DATA'            *
                               7979 *             BIT 3, MASK -10- PRINT 'UNEXP MICRO PGM HALT, EXP, & ACT'*
                               7980 *             BIT 4, MASK -08- PRINT 'CURAR ERROR - EXP & ACT DATA'   *
                               7981 *             BIT 5, MASK -04- PRINT 'MIAR INC, ERR - EXP & ACT DATA' *
                               7982 *             BIT 6, MASK -02- BYPASS ERROR PRINT/STOP                *
                               7983 *             BIT 7, MASK -01- BYPASS ERROR HALT                      *
                               7984 *                                                                     *
                               7985 *      DC     XL1'HH'                      .ERROR PRINTOUT/HALT ID    *
                               7986 *      DC     XL2'XXXX'                    .EXPECTED DATA (BIT 0|1|2 ON) *
                               7987 *                                                                     *
                               7988 *                                                                     *
                               7989 *      PROGRAMMING NOTE: KEEP CURRENT VALUES IN STATUS FIELDS.        *
                               7990 *                                                                     *
                               7991 *      ERROR MESSAGE IS PRINTED WITH THE HALT ID DISPLAYED IN THE     *
                               7992 *      HALT INDICATOR LIGHTS. RESETTING THE HALT WILL CAUSE THE       *
                               7993 *      PROGRAM TO RETURN TO THE NEXT SEQUENTIAL INSTRUCTION IN THE    *
                               7994 *      ROUTINE.                                                       *
                               7995 *                                                                     *
                               7996 ************************************************************************
                               7997
                               7997
    5DA5 34 08 5FE1            7998 STATUS ST     STATRB+3,ARR                     .STORE ARR, XR2, XR1, & PSR
    5DA9 34 02 5FDD            7999        ST     STATX2+3,XR2
                          5F1A 8000        USING  STATK7,XR2
    5DAD C2 02 5F1A            8001        LA     STATK7,XR2                       .USE XR2 FOR INDEXING
    5DB1 B4 01 BF              8002 STATP1 ST     STATX1+3(,XR2),XR1
    5DB4 B4 04 CE              8003        ST     STATPS(,XR2),PSR
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    5DB7 35 04 0D62           8004        L     ZERO.PSR                  .CLEAR PSR
    5DBB B5 01 C7             8005        L     STATRB+3(.XR2).XR1        .USE XR1 AS DATA POINTER
    5DBE 9C 00 C8 00          8006        MVC   STATFL(.XR2).0(1.XR1)     .SAVE FLAG BYTE
    5DC2 9C 00 46 01          8007        MVC   STATP2(.XR2).1(1.XR1)     .ENTER ERROR ID FOR PRINTOUT
    5DC6 D2 01 02             8008        LA    2(.XR1).XR1               .INCREMENT TO NEXT FIRLD
    5DC9 1C 01 5FE4 01        8009        MVC   STATEX.1(2.XR1)           .ENTER DATA & INCREMENT
    5DCE D2 01 02             8010        LA    2(.XR1).XR1                TO RETURN ADDRESS.
                              8011
                              8011
    5DD1 34 01 5FE1           8012        ST    STATRB+3.XR1              .STORE ADDRESS FOR RETURN
    5DD5 3C 00 6180           8013        MVI   ATTFLG.0                  .RESET ATTACHMENT CHECK FLAG
    5DD9 38 02 5FE2           8014        TBN   STATFL.X'02'              .TEST BYPASS PRINT/STOP ON
    5DDD C0 10 5FD2           8015        BT    STATRS                    .EXIT IF SO
                              8016
    5DE1 C0 87 021E           8017        B     UNPACK                    .UNPACK HI HBD ADDRESS
    5DE5 01              5DE5 8018        DC    XL1'01'
    5DE6 0D53            5DE7 8019        DC    AL2(HDBA)
    5DE8 5FF1            5DE9 8020        DC    AL2(STATM1)
                              8021
    5DEA C0 87 021E           8022        B     UNPACK                    .UNPACK LC HDB ADDRESS
    5DEE 01              5DEE 8023        DC    XL1'01'
    5DEF 0D52            5DF0 8024        DC    AL2(HDBA-1)
    5DF1 5FEE            5DF2 8025        DC    AL2(STATM1-3)
                              8026
    5DF3 C0 87 021E           8027        B     UNPACK                    .UNPACK EXPECTED DATA
    5DF7 02              5DF7 8028        DC    XL1'02'
    5DF8 5FE4            5DF9 8029        DC    AL2(STATEX)
    5DFA 6023            5DFB 8030        DC    AL2(STATM3)
                              8031
    5DFC C0 87 021E           8032        B     UNPACK                    .UNPACK ACTUAL DATA
    5E00 02              5E00 8033        DC    XL1'02'
    5E01 5FE6            5E02 8034        DC    AL2(STATAC)
    5E03 6037            5E04 8035        DC    AL2(STATM4)
                              8036
    5E05 C0 87 021E           8037        B     UNPACK                    .UNPACK CONTROL STORE ADDR
    5E09 02              5E09 8038        DC    XL1'02'
    5E0A 5673            5E0B 8039        DC    AL2(R05W01)
    5E0C 6060            5E0D 8040        DC    AL2(STATM2)
    5E0E 0C 09 6601 65F0      8041        MVC   ERRLOG(10).BLANKS         .BLANK OUT LOG OUT              *
    5E14 0C 03 6600 6037      8042        MVC   ERRLOG-1(4).STATM4        .INSERT ACT. DATA               *
    5E1A 0C 03 65FC 6023      8043        MVC   ERRLOG-5(4).STATM3        .INSERT EXP. DATA               *
    5E20 0C 00 65F2 5FE0      8044        MVC   ERRHLT(1).STATP2          .INSERT HALT CODE               *
    5E26 0C 00 65F1 0AC3      8045        MVC   ERRRTN(1).PRTN            .INSERT ROUTINE NO.             *
    5E2C 38 F0 6187           8046        TBN   XFLAG.X'F0'               .TEST HI BITS UNPREDICTABLE     *
    5E30 F2 90 0C             8047        JF    NOTHI                     .JUMP IF NOT
    5E33 0C 01 65FE 61EB      8048        MVC   ERRLOG-3(2).XXXX          .SET HI BITS UNPREDICATABLE     *
    5E39 0C 00 6601 61EB      8049        MVC   ERRLOG(1).XXXX
    5E3F 38 0F 6187           8050 NOTHI  TBN   XFLAG.X'0F'               .TEST LO BITS UNPREDICATBLE     *
    5E43 F2 90 0C             8051        JF    NOTLO                     .JUMP IF NOT
    5E46 0C 01 6600 61EB      8052        MVC   ERRLOG-1(2).XXXX          .SET LO BITS UNPREDICTABLE      *
    5E4C 0C 00 6601 61EB      8053        MVC   ERRLOG(1).XXXX
                              8054
                              8054
    5E52 8C 01 44 61E4        8055 NOTLO  MVC   STATAM(2.XR2).STATA1      .SET MESSAGE ADDRESS
    5E57 38 F0 6188           8056        TBN   YFLAG.X'F0'               HI BITS UNPREDICTABLE?
    5E5B F2 90 0C             8057        JF    CKLOW                     JUMP IF NOT
    5E5E 0C 01 65FE 61ED      8058        MVC   ERRLOG-3(2).YYYY          SET HI BITS UNPREDICTABLE (Y)
    5E64 0C 00 6601 61ED      8059        MVC   ERRLOG(1).YYYY
    5E6A 38 0F 6188           8060 CKLOW  TBN   YFLAG.X'0F'               LO BITS UNPREDICTABLE?
    5E6E F2 90 0C             8061        JF    CKHIZ                     JUMP IF NOT
    5E71 0C 01 6600 61ED      8062        MVC   ERRLOG-1(2).YYYY          SET LO BITS UNPREDICTABLE (Y)
    5E77 0C 00 6601 61ED      8063        MVC   ERRLOG(1).YYYY
    5E7D 38 0F 6189           8064 CKHIZ  TBN   ZFLAG.X'0F'
    5E81 F2 90 0C             8065        JF    CKLOWZ
    5E84 0C 01 6600 61EF      8066        MVC   ERRLOG-1(2).ZZZZ
    5E8A 0C 00 6601 61EF      8067        MVC   ERRLOG(1).ZZZZ
    5E90 38 F0 6189           8068 CKLOWZ TBN   ZFLAG.X'F0'
    5E94 F2 90 0C             8069        JF    STATK1
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    5E97 0C 01 65FE 61EF      8070        MVC   ERRLOG-3(2).ZZZZ
    5E9D 0C 00 6601 61EF      8071        MVC   ERRLOG(1).ZZZZ
    5EA3 BC 28 42             8072 STATK1 MVI   STATL(.XR2).40            .MOVE IN PRINT LINE LENGTH
    5EA6 8C 00 45 61AF        8073        MVC   STATP2-1(1.XR2).DEVID     .FILL IN DEVICE ID'S
    5EAB AC 01 B3 46          8074        MVC   STATEI(2.XR2).STATP2(.XR2)  .FILL IN HALT INFO
    5EAF B8 80 C8             8075        TBN   STATFL(.XR2).X'80'        .TEST FOR BIT 0 ON
    5EB2 F2 90 1C             8076        JF    STATK2                    .CONTINUE IF NOT
    5EB5 0C 08 600A 5FF1      8077        MVC   STATBL(9).STATM1          . MOVE IN HDB ADDR MSG
    5EBB BC 36 42             8078        MVI   STATL(.XR2).54            .MOVE IN PRINT LINE LENGTH
    5EBE 3C C8 65F8           8079        MVI   ERRLOG-9.C'H'             .SET CHAR FOR LOG OUT           *
    5EC2 0C 01 65FA 5FEE      8080        MVC   ERRLOG-7(2).STATM1-3      .INSERT HDB ADDR.               *
    5EC8 0C 00 65FB 6020      8081        MVC   ERRLOG-6(1).STATM3-3      .INSER EXP. DATA                *
    5ECE F2 87 7F             8082        J     STATPL                    .GO PRINT
    5ED1 B8 40 C8             8083 STATK2 TBN   STATFL(.XR2).X'40'        .TEST FOR BIT 1 ON
    5ED4 F2 90 49             8084        JF    STATK3                    .CONTINUE IF NOT
    5ED7 0C 18 600A 6060      8085        MVC   STATBL(25).STATM2         .MOVE IN CS ADDR. MSG.
    5EDD 3C E2 65F8           8086        MVI   ERRLOG-9.C'S'             .INSERT CHAR. FOR LOG OUT       *
    5EE1 0C 02 65FB 6060      8087        MVC   ERRLOG-6(3).STATM2        .INSERT ADDR. IN LOG OUT        *
    5EE7 38 20 566F           8088        TBN   R05SF1.X'20'              .TEST FOR PART 3                *
    5EEB F2 90 04             8089        JF    TP4                       .JUMP IF NOT                    *
    5EEE 3C D3 65FC           8090        MVI   ERRLOG-5.C'L'             .SET EXP. DATA CHAR             *
    5EF2 38 10 566F           8091 TP4    TBN   R05SF1.X'10'              .TEST FOR PART 4                *
    5EF6 F2 90 04             8092        JF    NP4                       .JUMP IF NOT                    *
    5EF9 3C C8 65FC           8093        MVI   ERRLOG-5.C'H'             .SET EXP DATA CHAR              *
    5EFD B8 20 C8             8094 NP4    TBN   STATFL(.XR2).X'20'        .TEST BIT 2 ON ALSO
    5F00 F2 90 17             8095        JF    STATK7                    .JUMP IF NOT
    5F03 BC 32 42             8096        MVI   STATL(.XR2).50            .INSERT MESSAGE LENGTH
    5F06 8C 01 44 61B6        8097        MVC   STATAM(2.XR2).STATA2      .CHANGE MESSAGE ADDRESS
    5F0B 0C 03 65FF 6023      8098        MVC   ERRLOG-2(4).STATM3        .INSERT EXP. IN LOG OUT         *
    5F11 0C 01 6601 65F0      8099        MVC   ERRLOG(2).BLANKS          .CLEAR LO 2 BYTE                *
    5F17 F2 87 36             8100        J     STATPL                    .GO PRINT
    5F1A BC 46 42             8101 STATK7 MVI   STATL(.XR2).70            .MOVE IN PRINT LINE LENGTH
    5F1D F2 87 30             8102        J     STATPL                    .GO PRINT
    5F20 B8 20 C8             8103 STATK3 TBN   STATFL(.XR2).X'20'        .TEST FOR BIT 2 ON
    5F23 F2 10 2A             8104        JT    STATPL                    .IF SO GO PRINT EXP. & ACT.
    5F26 B8 10 C8             8105        TBN   STATFL(.XR2).X'10'        .TEST FOR BIT 3 ON
    5F29 F2 90 10             8106        JF    STATK5                    .IF NOT CONTINUE
    5F2C 0C 18 600A 6110      8107        MVC   STATBL(25).STATMC         .MOVE IN MICRO CODE MSG.
    5F32 BC 46 42             8108        MVI   STATL(.XR2).70            .MOVE IN PRINT LINE LENGTH
    5F35 3C D4 65F8           8109        MVI   ERRLOG-9.C'M'             .INSERT CHAR. FOR ERROR LOG OUT*
    5F39 F2 87 14             8110        J     STATPL                    .GO PRINT
    5F3C B8 08 C8             8111 STATK5 TBN   STATFL(.XR2).X'08'        .TEST FOR BIT 4 ON
    5F3F C0 90 6061           8112        BF    STATK6                    .IF NOT GO TEST BIT 5 ON
    5F43 0C 0A 600A 611B      8113        MVC   STATBL(11).STATMD         .MOVE IN CURSOR ERROR MSG.
    5F49 BC 38 42             8114        MVI   STATL(.XR2).56            .MOVE IN PRINT LINE LENGTH
    5F4C 3C C3 65F8           8115        MVI   ERRLOG-9.C'C'             .INSERT CHAR. FOR LOG OUT       *
    5F50 B8 01 C8             8116 STATPL TBN   STATFL(.XR2).1            .TEST ERROR HALT BYPASS ON
    5F53 C0 90 61C0           8117        BF    STATNH                    .IF NOT. TEST FOR NO HEADER
    5F57 C0 87 021A           8118 STATPJ B     PRINT                     .PRINT DATA REQUESTED IN FLAG
    5F5B C2              5F5B 8119        DC    XL1'C2'                   .ERROR PRINTOUT AND SPACE 2
    5F5C 00              5F5C 8120 STATL  DC    IL1'00'                   .LENGTH GETS FILLED IN
    5F5D 6037            5F5E 8121 STATAM DC    AL2(STATM4)               .ADDRESS GETS FILLED IN
    5F5F 1400            5F60 8122 STATP2 DC    XL2'1400'                 .ERROR ID FILLED IN
                              8123
    5F61 C1 5D 619B           8124 STATP3 TIC   PADCHK.ATTCHK             .TEST FOR ATTACHMENT CHECK
    5F65 3D F0 64D4           8125 STATSP CLI   ELPFST.C'0'               .TEST 1ST ERROR LOG
    5F69 F2 01 00             8126        JNE   STATSQ                    .SKIP VOLTAGE MSG IF NOT
    5F6C 39 01 5FE2           8127 STATSQ TBF   STATFL.X'01'              .ERROR HALT BYPASS?
    5F70 F2 90 5F             8128        JF    STATRS
    5F73 38 F0 6187           8129        TBN   XFLAG.X'F0'
    5F77 C0 10 5FA7           8130        BT    LOGXAC
    5F7B 38 0F 6187           8131        TBN   XFLAG.X'0F'
    5F7F C0 10 5FA7           8132        BT    LOGXAC
    5F83 38 F0 6188           8133        TBN   YFLAG.X'F0'
    5F87 C0 10 5FAF           8134        BT    LOGYAC
    5F8B 38 0F 6188           8135        TBN   YFLAG.X'0F'
    5F8F C0 10 5FAF           8136        BT    LOGYAC
    5F93 38 F0 6189           8137        TBN   ZFLAG.X'F0'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   5F97 C0 10 5F87           8138         BT    LOGZAC
   5F9B 38 0F 61B9           8139         TBN   ZFLAG,X'0F'
   5F9F C0 10 5F87           8140         BT    LOGZAC
   5FA3 C0 87 5F8F           8141         B     GOELPO
                             8142
   5FA7 3C E7 6601           8143 LOGXAC  MVI   ERRLOG,C'X'
   5FAB C0 87 5F8F           8144         B     GOELPO
                             8145
   5FAF 3C E8 6601           8146 LOGYAC  MVI   ERRLOG,C'Y'
   5FB3 C0 87 5F8F           8147         B     GOELPO
                             8148
   5FB7 3C E9 6601           8149 LOGZAC  MVI   ERRLOG,C'Z'
   5FBB C0 87 5F8F           8150         B     GOELPO
                             8151
   5FBF C0 87 63FE           8152 GOELPO  B     ELPO          GO PRINT ERROR LOG
                             8153
   5FC3 C0 87 021A           8154         B     PRINT
   5FC7 96                5FC7 8155         DC    XL1'96'       .SPACE 6 LINES
                             8156
   5FC8 C0 87 0222           8157         B     HALT
   5FCC 1400              5FCD 8158 STATEI DC    XL2'1400'     .ERROR HALT
   5FCE C0 87 0216           8159         B     LINK          .ERROR ID FILLED IN
                             8160                             .EXIT ROUTINE
   5FD2 35 04 5FE8           8161 STATRS  L     STATPS,PSR    .RESTORE XR1, XR2, & PSR
   5FD6 C2 01 0000           8162 STATX1  LA    *-*,XR1
   5FDA C2 02 0000           8163 STATX2  LA    *-*,XR2
   5FDE C0 87 0000           8164 STATRB  B     *-*
                             8165
                             8165
                             8165
   5FE2 00                5FE2 8166 STATFL  DC    XL1'0'        .FLAG BYTE    -PASSED PARAMETER
   5FE3 0000              5FE4 8167 STATEX  DC    XL2'0'        .EXPECTED DATA-PASSED PARAMETER
   5FE5 0000              5FE6 8168 STATAC  DC    XL2'0'        .ACTUAL DATA  -FILLED IN BY PROG
   5FE7 0000              5FE8 8169 STATPS  DC    XL2'0'
                             8170
                             8170
                             8170
                          5FE9 8171 STATM0  EQU   *
   5FE9 C8C4C240E7E76CE7  5FF1 8172 STATM1  DC    CL9'HDB XX-XX'
   5FF1 E7                   8172
   5FF2 4040404040404040  600A 8173 STATBL  DC    25CL1' '      .BLANK FIELD
   5FFA 4040404040404040     8173
   6002 4040404040404040     8173
   600A 40                   8173
   600B 404060            600D 8174         DC    CL3' -'
   600E 4040C5E7D7C5C3E3  6023 8175 STATM3  DC    CL22'  EXPECTED DATA = XXXX'
   6016 C5C440C4C1E3C140     8175
   601E 7E40E7E7E7E7E7       8175
   6024 4040C1C3E3E4C1D3  6037 8176 STATM4  DC    CL20'  ACTUAL DATA = XXXX'
   602C 40C4C1E3C1407E40     8176
   6034 E7E7E7E7             8176
   6038 C1E3E3C1C3C8D4C5  6047 8177 STATM5  DC    CL16'ATTACHMENT CHECK'
   6040 D5E340C3C8C5C3D2     8177
   6048 C3D6D5E3D9D6D340  6060 8178 STATM2  DC    CL25'CONTROL STORE ADDR = XXXX'
   6050 E2E3D6D9C540C3C4     8178
   6058 C4D9407E40E7E7E7     8178
   6060 E7                   8178
   6061 88 04 C8             8179 STATK6  TBN   STATFL(,XR2),X'04'    .TEST FOR BIT 5 ON
   6064 E0 90 36             8180         BF    STATPL(,XR2)        .IF NOT GO PRINT
   6067 0C 13 600A 61BF      8181         MVC   STATBL(20),STATME   .MOVE MESSAGE TO PRINT FIELD
   606D BC 41 42             8182         MVI   STATL(,XR2),65      .MOVE IN PRINT FIELD LENGTH
   6070 3C C9 65F8           8183         MVI   ERRLOG-9,C'I'       .INSERT CHAR. FOR LOG OUT
   6074 E0 87 36             8184         B     STATPL(,XR2)        .GO PRINT
                             8185
   6077 C9D5E3C5D9D9E4D7  6087 8186 STATM6  DC    CL17'INTERRUPT PENDING'
   607F E340D7C5D5C4C5D5     8186
   6087 C7                   8186
   6088 C1E3E3C1C3C84040  60A2 8187 STATN7  DC    CL27'ATTACH. SHOULD NOT BE READY'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   6090 E2C8D6E4D3C440D5     8187
   6098 D6E340C2C540D9C5     8187
   60A0 C1C4E8               8187
   60A3 C1E3E3C1C3C84040  60B3 8188 STATM8  DC    CL17'ATTACH. NOT READY'
   60AB D5D6E340D9C5C1C4     8188
   60B3 E8                   8188
   60B4 C1E3E3C1C3C84040  60C2 8189 STATM9  DC    CL15'ATTACH. IS BUSY'
   60BC C9E240C2E4E2E8       8189
   60C3 C9D5E3D94840E2C8  60E1 8190 STATMA  DC    CL31'INTR. SHOULD BE PENDING. IS NOT'
   60CB D6E4D3C440C2C540     8190
   60D3 D7C5D5C4C9D5C76B     8190
   60DB 40C9E240D5D6E3       8190
   60E2 C1E3E3C1C3C84040  60F7 8191 STATMB  DC    CL22'ATTACH. SHOULD BE BUSY'
   60EA E2C8D6E4D3C44CC2     8191
   60F2 C540C2E4E2E8         8191
   60F8 E4D5C5E7D7C5C3E3  6110 8192 STATMC  DC    CL25'UNEXPECTED MICRO PGM HALT'
   6100 C5C440D4C9C3D5D6     8192
   6108 40D7C7D440C8CBD3     8192
   6110 E3                   8192
   6111 C3E4D9C1D940C5D9  611B 8193 STATMD  DC    CL11'CURAR ERROR'
   6119 D9D6D9               8193
   611C D4C9C1D940C9D5C3  612F 8194 STATME  DC    CL20'MIAR INCREMENT ERROR'
   6124 D9C5D4C5D5E34CC5     8194
   612C D9D9D6D9             8194
   6130 E4D5C5E7D7C5C3E3  613E 8195 STATB0  DC    CL15'UNEXPECTED INT.'
   6138 C5C440C9D5E34E       8195
   613F D5D6E340D9C4E661  614D 8196 STATB1  DC    CL15'NOT RDY/UNIT CK'
   6147 E4D5C9E340C3D2       8196
   614E D5D6E340D9C4E661  6160 8197 STATB2  DC    CL19'NOT RDY/UNIT CK CFF'
   6156 E4D5C9E340C3D240     8197
   615E D6C6C6               8197
   6161 C8C4C240E2D5E240  6176 8198 STATB3  DC    CL22'HDB SNS DATA INCORRECT'
   6169 C4C1E3C140C9D5C3     8198
   6171 D6D9D9C5C3E3         8198
   6177 C2E2C3C140D9C4E8  617E 8199 STATB4  DC    CL8'BSCA RDY'
   617F D5D640C9D5E34CD6  6190 8200 STATB5  DC    CL18'NO INT ON ATTCH CK'
   6187 D540C1E3E3C3C640     8200
   618F C3D2                 8200
   6191 C2E2C3C140C2E4E2  619A 8201 STATB6  DC    CL10'BSCA BUSY '
   6199 E840                 8201
   619B C0 87 021A           8202 PADCHK  B     PRINT                 PRINT ATTACHMENT CHECK
   619F 82                619F 8203         DC    XL1'82'
   61A0 10                61A0 8204         DC    IL1'16'
   61A1 6047              61A2 8205 ATTMA  DC    AL2(STATM5)
   61A3 3C FF 61B0           8206         MVI   ATTFLG,X'FF'          .SET ATTACHMENT CHECK FLAG
   61A7 C0 87 621B           8207         B     PCHK                  .GO PRINT ATTACHMENT CHECKS
   61AB C0 87 5F65           8208         B     STATSP
                             8209
   61AF 89                61AF 3210 DEVID  DC    XL1'89'               .DEVICE ID GETS FILLED IN
   61B0 00                61B0 8211 ATTFLG DC    XL1'0'                .ATTACHMENT CHECK FLAG
   61B1 00                61B1 8212 VOLTFL DC    XL1'0'                .VOLTAGE MESSAGE FLAG
   61B2 00                61B2 8213 VOLT5F DC    XL1'0'                .AUX 5V. MSG FLAG
   61B3 6037              61B4 8214 STATA1 DC    AL2(STATM4)
   61B5 6023              61B6 8215 STATA2 DC    AL2(STATM3)
   61B7 00                61B7 8216 XFLAG  DC    XL1'0'
   61B8 00                61B8 8217 YFLAG  DC    XL1'00'
   61B9 00                61B9 8218 ZFLAG  DC    XL1'00'
   61BA E7E7              61BB 8219 XXXX   DC    CL2'XX'
   61BC E8E8              61BD 8220 YYYY   DC    CL2'YY'
   61BE E9E9              61BF 8221 ZZZZ   DC    CL2'ZZ'
                             8222
                             8222
   61C0 3D 00 61B7           8223 STATNH CLI   XFLAG,0               .TEST FLAG
   61C4 C0 81 5F57           8224         BE    STATPO                .IF ZERO, PRINT HEADING
   61C8 3C 00 61B7           8225         MVI   XFLAG,0               .RESET FLAG
   61CC 3C 00 61B8           8226         MVI   YFLAG,0
   61D0 3C 00 61B9           8227         MVI   ZFLAG,0
   61D4 0C 02 61E1 5FEE      8228         MVC   NHADR(3),STATAM       .INSERT LGTH. & ADDR
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    61DA C0 87 021A           8229         B      PRINT                        .PRINT WITH NO HEADER
    61DE 82              61DE 8230         DC     XL1'82'
    61DF 00              61DF 8231         DC     IL1'0'
    61E0 0000            61E1 8232 NHADR   DC     AL2(*-*)
    61E2 C0 87 5F61           8233         B      STATP3                       .RETURN TO FINISH ROUTINE
                              8234
                              8235 ************************************************
                              8236 *   SUBROUTINE - ANALIZE AND PRINT ATT. CHECKS ***********************
                              8237 ************************************************                        *
                              8238 *                                                                       *
                              8239 *       B      TSTCHK                       CHECK AND PRINT ERRORS      *
                              8240 *       DC     XL1'XX'                                                  *
                              8241 *       DC     XL1'HC'                                                  *
                              8242 *       WHERE 'XX' SIGNIFIYS ERRORS EXPECTED                            *
                              8243 *              BIT 0 =1= CP DECODE CHECK                                *
                              8244 *              BITS 1-3 MUST BE ZERO                                    *
                              8245 *              BIT 4 =1= HDB/EXT CHECK                                  *
                              8246 *              BIT 5 =1= CCNTROL STORE DATA CHECK                       *
                              8247 *              BIT 6 =1= CONTROL STORE WRITE DATA CHECK                 *
                              8248 *              BIT 7 =1= CONTROL STORE ADDRESS CHECK                    *
                              8249 *       'HC' SIGNIFIES THE HALT CODE TO BE USED FOR ERROR HALTS         *
                              8250 *                                                                       *
                              8251 *       B      PCHK                         PRINTS OUT ERRORS           *
                              8252 *                                                                       *
                              8253 *************************************************************************
                              8254
    61E6 34 08 62E4           8255 TSTCHK  ST     ERRT+3.ARR                   .STCRE RETURN ACDRESS
    61EA 34 01 62E0           8256         ST     TXR1+3.XR1                   .STORE XR1
    61EE 35 01 62E4           8257         L      ERRT+3.XR1                   .LOAD ADDRESS OF PARAMETERS
    61F2 0E 01 62E4 5BE6      8258         ALC    ERRT+3(2).X0002              .UPDATE RETURN ADDRESS
    61F8 1C 00 62E5 00        8259         MVC    EXERR.0(1.XR1)               .LOAD EXPECTED ERRORS
    61FD 1C 00 6298 01        8260         MVC    ERHC1.1(1.XR1)               .LOAD HALT CODE
    6202 0C 09 6601 65F0      8261         MVC    ERRLOG(10).BLANKS            .BLANK OUT LOG OUT          *
    6208 1C 00 65F2 01        8262         MVC    ERRHLT.1(1.XR1)              .LOAD THE HALT CODE         *
    620D 0C 00 65F1 0AC3      8263         MVC    ERRRTN(1).PRTN               .LCAD THE RCUTINE NO.
    6213 1C 00 62D2 01        8264         MVC    ERHC2.1(1.XR1)               .LOAD HALT CODE
    621E F2 87 0C             8265         J      STERR
    621B 34 08 62E4           8266 PCHK    ST     ERRT+3.ARR                   .STORE RETURN ADDRESS
    621F 34 01 62E0           8267         ST     TXR1+3.XR1                   .STORE XR1
    6223 3C 00 62E5           8268         MVI    EXERR.0                      .RESET FLAG BYTE
    6227 3C 40 63FB           8269 STERR   MVI    ERRPOE.C' '                  .CLEAR PRINT OUT AREA
    622B 0C 22 63FA 63FB      8270         MVC    ERRPOE-1(35).ERRPOE
    6231 3C 8F 62E6           8271         MVI    ACTERR.X'8F'                 .INITIALIZE FLAG BYTE
    6235 C1 5A 623D           8272         TIO    ERR4.HDBCHK                  .TEST FOR HDB/EXT CHECK
    6239 3B 0C 62E6           8273         SBF    ACTERR.X'08'                 .RESET HDB/EXT CHECK BIT
    623D C1 5C 6245           8274 ERR4    TIO    ERR3.FETADR                  .TEST FOR C.S. ADDR. CH.
    6241 3B 01 62E6           8275         SBF    ACTERR.X'01'                 .RESET BIT
    6245 C1 5E 624D           8276 ERR3    TIO    ERR2.FETWRD                  .TEST FOR C.S. WR. DATA CH.
    6249 3B 02 62E6           8277         SBF    ACTERR.X'02'                 .RESET BIT
    624D C1 5B 6255           8278 ERR2    TIO    ERR1.CSCHK                   .TEST FOR C.S. CHECK
    6251 3B 04 62E6           8279         SBF    ACTERR.X'04'                 .RESET BIT
    6255 C1 5D 625D           8280 ERR1    TIO    ERR0.ATTCHK                  .TEST FOR ATT. CHK.
    6259 3B 80 62E6           8281         SBF    ACTERR.X'80'                 .RESET BIT - ACTERR NOW HOLDS
                              8282 *                                            IMAGE OF ACTUAL TYPES OF
                              8283 *                                            ATTCHMENT CHECKS
    625D C0 87 021E           8284 ERR0    B      UNPACK                       .UNPACK ACT ERROR CODES     *
    6261 01              6261 8285         DC     XL1'01'                                                  *
    6262 62E6            6263 8286         DC     AL2(ACTERR)                                              *
    6264 63FD            6265 8287         DC     AL2(R18WK)                                               *
    6266 0C 00 6601 63FD      8288         MVC    ERRLOG(1).R18WK                                          *
    626C 3D 00 62E5           8289         CLI    EXERR.0                      .TEST FOR PRINT ONLY
    6270 F2 01 13             8290         JNE    TSTERR                       .JUMP IF NOT
    6273 0C 00 62E7 62E6      8291         MVC    POFLG(1).ACTERR              .SET UP TO PRINT ACTUAL ERRORS
    6279 C0 87 62E8           8292         B      POERR                        .GO PRINT
    627D C0 87 021A           8293         B      PRINT                        .GO SPACE 2
    6281 92              6281 8294         DC     XL1'92'
    6282 C0 87 62E1           8295         B      ERRT                         .GO EXIT
                              8296
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    6286 0D 00 62E5 62E6      8297 TSTERR  CLC    EXERR(1).ACTERR              .CHECK ACTUAL = EXPECTED
    628C F2 81 4B             8298         JE     RSTRT                        . IF SO. RESET AND EXIT
    628F C0 87 021A           8299         B      PRINT                        .ERROR. PRINT 'EXPECTED'
    6293 C1              6293 8300         DC     XL1'C1'
    6294 0A              6294 8301         DC     IL1'10'
    6295 63A3            6296 8302         DC     AL2(R18EXP)
    6297 1400            6298 8303 ERHC1   DC     XL2'1400'                    .HALT CODE GETS FILLED IN
    6299 0C 00 62E7 62E5      8304         MVC    POFLG(1).EXERR               .SET UP TO PRINT EXPECTED ERR.
    629F C0 87 62E8           8305         B      POERR                        .GO PRINT THEM
                              8306
    62A3 C0 87 021A           8307         B      PRINT                        .PRINT RECEIVED
    62A7 81              62A7 8308         DC     XL1'81'
    62A8 0A              62A8 8309         DC     IL1'10'
    62A9 63AD            62AA 8310         DC     AL2(R18REC)
    62AB 0C 00 62E7 62E6      8311         MVC    POFLG(1).ACTERR              .SET UP TO PRINT ACT. ERR.
    62B1 C0 87 62E8           8312         B      POERR                        .GO PRINT THEM
    62B5 C0 87 021E           8313         B      UNPACK                       .UNPACK EXP ERROR CODES     *
    62B9 01              62B9 8314         DC     XL1'01'                                                  *
    62BA 62E5            62BB 8315         DC     AL2(EXERR)                                               *
    62BC 63FD            62BD 8316         DC     AL2(R18WK)                                               *
    62BE 0C 00 65F8 63FD      8317         MVC    ERRLOG-9(1).R18WK            .MOVE IN ACT ERRCR CODE     *
    62C4 C0 87 63FE           8318         B      ELPO                         .GO PRINT ERROR LOG         *
    62C8 C0 87 021A           8319         B      PRINT                        .SPACE 6
    62CC 96              62CC 8320         DC     XL1'96'
    62CD C0 87 0222           8321         B      HALT                         .GO HALT
    62D1 1400            62D2 8322 ERHC2   DC     XL2'1400'                    .HALT CODE FILLED IN
    62D3 F3 58 80             8323         SIO    X'80'.SIOI                   .RESET ATTACHMENT CHECK
    62D6 C0 87 0216           8324         B      LINK                         .EXIT ROUTINE
                              8325
    62DA F3 58 80             8326 RSTRT   SIO    X'80'.SIOI                   .DISABLE TO RESET CHECKS
    62DD C2 01 0000           8327 TXR1    LA     *-*.XR1                      .RESTORE XR1
    62E1 C0 87 0000           8328 ERRT    B      *-*                          .RETURN TO USER
                              8329
    62E5 00              62E5 8330 EXERR   DC     XL1'0'                       .EXPECTED ERROR FLAG
    62E6 00              62E6 8331 ACTERR  DC     XL1'0'                       .ACTUAL ERROR FLAG
    62E7 00              62E7 8332 POFLG   DC     XL1'0'                       .PRINT OUT ERROR FLAG
                              8333
    62E8 34 08 637F           8334 POERR   ST     POERRT+3.ARR                 .STORE RETURN ADDRESS
    62EC 38 08 62E7           8335         TBN    POFLG.X'08'                  .TEST HDB/EXT FLAG ON
    62F0 F2 90 10             8336         JF     TERR3
    62F3 0C 06 63E4 63C8      8337         MVC    ERRPOS+13(7).R18HDB          .MOVE IN ERROR TYPE
    62F9 0C 05 63EA 63C1      8338         MVC    ERRPOS+19(6).R18CHK
    62FF C0 87 6380           8339         B      PERR                         .GO PRINT HDB/EXT CHECK
    6303 38 01 62E7           8340 TERR3   TBN    POFLG.X'01'                  .TEST C.S. ADDR ERR.
    6307 F2 90 10             8341         JF     TERR2
    630A 0C 11 63EF 60E9      8342         MVC    ERRPOS+24(18).R18CSA         .MOVE IN ERROR TYPE
    6310 0C 05 63F5 63C1      8343         MVC    ERRPOS+30(6).R18CHK
    6316 C0 87 6380           8344         B      PERR                         .GO PRINT C.S. ADDR. CHK.
    631A 38 02 62E7           8345 TERR2   TBN    POFLG.X'02'                  .TEST C.S. WR. DATA CHK.
    631E F2 90 16             8346         JF     TERR1
    6321 0C 0C 63EA 60E4      8347         MVC    ERRPOS+19(13).R18CS          .MOVE IN ERROR TYPE
    6327 0C 0A 63F5 63C3      8348         MVC    ERRPOS+30(11).R18WRD
    632D 0C 05 63FB 63C1      8349         MVC    ERRPOS+36(6).R18CHK
    6333 C0 87 6380           8350         B      PERR                         .GO PRINT C.S. WR. DATA CHK.
    6337 38 04 62E7           8351 TERR1   TBN    POFLG.X'04'                  .TEST C.S. DATA CHK.
    633B F2 90 10             8352         JF     TERR0
    633E 0C 0C 63EA 60E4      8353         MVC    ERRPOS+19(13).R18CS          .MOVE IN ERROR TYPE
    6344 0C 0A 63F5 63C1      8354         MVC    ERRPOS+30(11).R18CHK
    634A C0 87 6380           8355         B      PERR                         .GO PRINT C.S. CHK.
    634E 3D 80 62E7           8356 TERR0   CLI    POFLG.X'80'                  .TEST FOR OP DECODE CHK ONLY
    6352 F2 01 10             8357         JNE    TNONE                        .IF NOT TEST FOR NO CHK.
    6355 0C 08 63E6 63E6      8358         MVC    ERRPOS+15(9).R18OPD          .MOVE IN ERROR TYPE
    635B 0C 05 63EC 63C1      8359         MVC    ERRPOS+21(6).R18CHK
    6361 C0 87 6380           8360         B      PERR                         .GO PRINT OP DECODE CHECK
    6365 3D 00 62E7           8361 TNONE   CLI    POFLG.0                      .TEST FOR NO CHECKS
    6369 F2 01 10             8362         JNE    POERRT                       .IF NOT. EXIT
    636C 0C 03 63E1 63C7      8363         MVC    ERRPOS+10(4).R18NON          .MOVE IN NONE MSG.
    6372 0C 03 6601 63C7      8364         MVC    ERRLOG(4).R18NON             .MOVE NONE TO LOG OUT       *
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ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

    6378 C0 87 6380             8365        B      PERR                .GO PRINT 'NONE'
    637C C0 87 0000             8366 POERRT B      *-*                 .RETURN TO USER
                                8367
    6380 34 08 6399             8368 PERR   ST     PERRT+3,ARR         .STORE RETURN ADDRESS
    6384 C0 87 021A             8369        B      PRINT               .GO PRINT ERROR TYPE
    6388 81                6388 8370        DC     XL1'81'
    6389 24                6389 8371        DC     IL1'36'
    638A 63F8              638B 8372        DC     AL2(ERRPOE)
    638C 3C 40 63FB             8373        MVI    ERRPOE,C' '         .BLANK OUT PRINT AREA
    6390 0C 22 63FA 63FB        8374        MVC    ERRPOE-1(35),ERRPOE
    6396 C0 87 0000             8375 PERRT  B      *-*                 .RETURN TO USER
                                8376
    639A C5E7D7C5C3E3C5C4  63A3 8377 R18EXP DC     CL10'EXPECTED -'
    63A2 4060                   8377
    63A4 D9C5C3C5C9E5C5C4  63AD 8378 R18REC DC     CL10'RECEIVED -'
    63AC 4060                   8378
    63AE D6D740C4C5C3D6C4  63B6 8379 R18OPD DC     CL9'OP DECODE'
    63B6 C5                     8379
    63B7 40C4C1E3C140C3C8  63C1 8380 R18CHK DC     CL11' DATA CHECK'
    63BF C5C3D2                 8380
    63C2 C8C4C261C5E7E3    63C8 8381 R18HDB DC     CL7'HDB/EXT'
    63C9 40E6D9C9E3C540C4  63D3 8382 R18WRD DC     CL11' WRITE DATA'
    63D1 C1E3C1                 8382
    63D4 D5D6D5C5          63D7 8383 R18NON DC     CL4'NONE'
                           63D7 8384 ERRPOS EQU    *-1                 .START OF PRINT LINE
    63D8 4040404040404040  63FB 8385 ERRPOE DC     36CL1' '            .PRINT LINE
    63E0 4040404040404040       8385
    63E8 4040404040404040       8385
    63F0 4040404040404040       8385
    63F8 40404040               8385
                           6054 8386 R18CS  EQU    STATM2-12
                           6059 8387 R18CSA EQU    STATM2-7
    63FC 0000              63FD 8388 R18WK  DC     XL2'0'              .WORK SPACE
                                8389 ***************************************
                                8390 *        SUBROUTINE - PRINT ERROR LOG   ************************************
                                8391 ***************************************
                                8392 *        THE FOLLOWING SUBROUTINE WILL CAUSE A PRINT OUT OF AN ERROR      *
                                8393 *        LOG WHICH IS COMPILED UNIQUE TO EACH HALT.                       *
                                8394 **************************************************************************
                                8395
    63FE 34 08 64C5             8396 ELPO   ST     ELPORT+3,ARR        .SAVE RETURN ADDRESS
    6402 C0 87 021E             8397        B      UNPACK              .UNPACK THE HALT CODE
    6406 01                6406 8398        DC     XL1'01'
    6407 65F2              6408 8399        DC     AL2(ERRHLT)
    6409 65F7              640A 8400        DC     AL2(UNPHLT)
    640B C0 87 021E             8401        B      UNPACK              .UNPACK THE ROUTINE NUMBER
    640F 01                640F 8402        DC     XL1'01'
    6410 65F1              6411 8403        DC     AL2(ERRRTN)
    6412 65F5              6413 8404        DC     AL2(UNPRTN)
    6414 3D 00 65F3             8405        CLI    IPLFLG,0            *** REMOVE FOR RELEASE ***
    6418 F2 81 A7               8406        JE     ELPORT              *** REMOVE FOR RELEASE ***
    641B 06 00 6404 65E6        8407        AZ     ELPFST(1),DECONE(1) .INCREMENT ERROR LOG NO.
    6421 0C 0D 64E4 66C1        8408        MVC    ELPFLD-1(14),ERRLOG .SET UP FOR PRINT OUT       *
    6427 C0 87 021A             8409        B      PRINT               .SPACE 1 BEFORE PRINT
    642B 91                642B 8410        DC     XL1'91'
    642C C0 87 021A             8411        B      PRINT
    6430 81                6430 8412        DC     XL1'81'
    6431 0F                6431 8413        DC     IL1'15'
    6432 64D4              6433 8414        DC     AL2(ELPFST)
    6434 0C 01 64EF 64D8        8415        MVC    LOGROU(2),ELPFLD-13
    643A 0C 01 64F9 64DA        8416        MVC    LOGHLT(2),ELPFLD-11
                                8417
                                8418 * THE FOLLOWING  9 OPS CHANGE ANY BLANKS IN THE
                                8419 * 10-BYTE ERROR LOG TO DASHES.
    6440 0C 01 644F 650D        8420        MVC    CHKBLK+3(2),LOGADL  PUT LEFT ADR IN BLANK CHECK OP
    6446 0C 01 6457 644F        8421 LOOP10 MVC    CLRBLK+3(2),CHKBLK+3 MAKE ADDR IN CLR OP=TO BLANK OP
    644C 3D 40 0000             8422 CHKBLK CLI    *-*,X'40'           IS THIS BYTE BLANK?
    6450 C0 01 6458             8423        BNE    CHKEND              BR IF NOT
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ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

    6454 3C 60 0000             8424 CLRBLK MVI    *-*,X'60'           PUT IN A DASH.
    6458 0D 01 650F 644F        8425 CHKEND CLC    LOGADR(2),CHKBLK+3  INCR. ADDR = RIGHT BYTE
    645E C0 81 646C             8426        BE     PRTLOG              BR IF SO.
    6462 0E 01 644F 56C9        8427        ALC    CHKBLK+3(2),X0001   INCR. ADDR.
    6468 C0 87 6446             8428        B      LOOP10
                                8429
    646C C0 87 021A             8430 PRTLOG B      PRINT
    6470 81                6470 8431        DC     XL1'81'
    6471 0A                6471 8432        DC     IL1'10'
    6472 64EF              6473 8433        DC     AL2(LOGROU)
    6474 C0 87 021A             8434        B      PRINT
    6478 81                6478 8435        DC     XL1'81'
    6479 0A                6479 8436        DC     IL1'10'
    647A 64F9              647B 8437        DC     AL2(LOGHLT)
    647C 0C 09 650B 64E4        8438        MVC    LOGLOG(10),ELPFLD-1
    6482 C0 87 021A             8439        B      PRINT
    6486 81                6486 8440        DC     XL1'81'
    6487 12                6487 8441        DC     IL1'18'
    6488 650B              6489 8442        DC     AL2(LOGLOG)
    648A 3D 07 65F1             8443        CLI    ERRRTN,X'07'        TEST FOR RTN 07
    648E F2 01 0C               8444        JNE    TRTN21              IF NOT TEST FOR RTN 21
    6491 0D 09 650B 6613        8445        CLC    LOGLOG(10),ULOG1    TEST FOR POSSIBLE UDT ERROR
    6497 F2 01 24               8446        JNE    ELPORE              OUT IF NOT
    649A F2 87 19               8447        J      UDTPO               GO PRINT CAUTION
    649D 3D 21 65F1             8448 TRTN21 CLI    ERRRTN,X'21'        TEST FOR RTN 21
    64A1 F2 01 1A               8449        JNE    ELPORE              OUT IF NOT
    64A4 0D 09 650B 661D        8450        CLC    LOGLOG(10),ULOG2    TEST FOR POSSIBLE UDT ERROR
    64AA F2 81 09               8451        JE     UDTPO               PRINT IF SO
    64AD 0D 09 650B 6627        8452        CLC    LOGLOG(10),ULOG3    TEST FOR POSSIBLE UDT ERROR
    64B3 F2 01 08               8453        JNE    ELPORE              OUT IF NOT
    64B6 C0 87 021A             8454 UDTPO  B      PRINT               GO PRINT MESSAGE
    64BA 81                64BA 8455        DC     XL1'81'
    64BB 4F                64BB 8456        DC     IL1'79'
    64BC 6676              64BD 8457        DC     AL2(UDTMSG)
    64BE C0 87 6602             8458 ELPORE B      ELLINK              *** REMOVE FOR RELEASE ***
    64C2 C0 87 0000             8459 ELPORT B      *-*                 .RETURN TO USER
    64C6 C5D9D9D6D940D3D6  64D4 8460 ELPFST DC     CL15'ERROR LOG NO. X'
    64CE C740D5D64B40E7         8460
    64D5 4060E7E7E7E7E7E7  64E5 8461 ELPFLD DC     CL17' -XXXXXXXXXXXXXX-'
    64DD E7E7E7E7E7E7E7E7       8461
    64E5 60                     8461
    64E6 404040D9D6E4E37E  64EF 8462 LOGROU DC     CL10'   ROUT=XX'
    64EE E7E7                   8462
    64F0 404040C8C1D3E37E  64F9 8463 LOGHLT DC     CL10'   HALT=YY'
    64F8 E8E8                   8463
    64FA 40404040D3D6C77E  650B 8464 LOGLOG DC     CL18'    LOG=ZZZZZZZZZZ'
    6502 E9E9E9E9E9E9E9E9       8464
    650A E9E9                   8464
    650C 64DB              650D 8465 LOGADL DC     AL2(ELPFLD-10)      LEFT ADDR OF 10-BYTE LOG
    650E 64E4              650F 8466 LOGADR DC     AL2(ELPFLD-1)       RIGHT ADDR
    6510 60A2              6511 8467 MTABLE DC     AL2(STATM7)         .TABLE OF MESSAGES FOR PRINTM *
    6512 6559              6513 8468        DC     AL2(M7L)                                          *
    6514 6087              6515 8469        DC     AL2(STATM6)                                       *
    6516 6563              6517 8470        DC     AL2(M6L)                                          *
    6518 6047              6519 8471        DC     AL2(STATM5)                                       *
    651A 656D              651B 8472        DC     AL2(M5L)                                          *
    651C 60C2              651D 8473        DC     AL2(STATM9)                                       *
    651E 6577              651F 8474        DC     AL2(M9L)                                          *
    6520 60B3              6521 8475        DC     AL2(STATM8)                                       *
    6522 6581              6523 8476        DC     AL2(M8L)                                          *
    6524 60E1              6525 8477        DC     AL2(STATMA)                                       *
    6526 658B              6527 8478        DC     AL2(MAL)                                          *
    6528 60F7              6529 8479        DC     AL2(STATMB)                                       *
    652A 6595              652B 8480        DC     AL2(MBL)
    652C 39A6              652D 8481        DC     AL2(R1CM1)                                        *
    652E 659F              652F 8482        DC     AL2(M1L)                                          *
    6530 0E01              6531 8483        DC     AL2(OPDECF)                                       *
    6532 65A9              6533 8484        DC     AL2(MOPD)                                         *
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8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    6534 613E             653E 8485         DC    AL2(STATE0)
    6536 65B3             6537 8486         DC    AL2(MB0)
    6538 614D             6539 8487         DC    AL2(STATE1)
    653A 65BD             653B 8488         DC    AL2(MB1)
    653C 6160             653D 8489         DC    AL2(STATB2)
    653E 65C7             653F 8490         DC    AL2(MB2)
    6540 6176             6541 8491         DC    AL2(STATB3)
    6542 65D1             6543 8492         DC    AL2(MB3)
    6544 617E             6545 8493         DC    AL2(STATB4)
    6546 65DB             6547 8494         DC    AL2(MB4)
    6548 6190             6549 8495         DC    AL2(STATB5)
    654A 65E5             654B 8496         DC    AL2(MB5)
    654C 619A             654D 8497         DC    AL2(STATB6)
    654E 619A             654F 8498         DC    AL2(STATB6)
    6550 C1E3E340E2D5C340 6559 8499 M7L     DC    CL10'ATT SNB RD'
    6558 D9C4             8499
    655A C9D5E3D940D7D5C4 6563 8500 M6L     DC    CL10'INTR PND  '
    6562 4040             8500
    6564 C1E3E340C3C8D340 656D 8501 M5L     DC    CL10'ATT CHK   '
    656C 4040             8501
    656E C1E3E340C2E4E2E8 6577 8502 M9L     DC    CL10'ATT BUSY  '
    6576 4040             8502
    6578 C1E3E340D561D5C4 6581 8503 M8L     DC    CL10'ATT N/RDY '
    6580 E840             8503
    6582 C9D5E340E2C24040 658B 8504 MAL     DC    CL10'INT SB PND'
    658A D5C4             8504
    658C C1E3E340E2C24040 6595 8505 MBL     DC    CL10'ATT SB BSY'
    6594 E2E8             8505
    6596 E7E740C9D5E3D540 659F 8506 M1L     DC    CL10'XX INTR   '
    659E 4040             8506
    65A0 D6D740C4C5C34040 65A9 8507 MOPD    DC    CL10'OP DEC    '
    65A8 4040             8507
    65AA E4D5C5E7D740C9D5 65B3 8508 MB0     DC    CL10'UNEXP INT '
    65B2 E340             8508
    65B4 D5D961E4C3404040 65BD 8509 MB1     DC    CL10'NR/UC     '
    65BC 4040             8509
    65BE D5D961E4C340D6C6 65C7 8510 MB2     DC    CL10'NR/UC OFF '
    65C6 C640             8510
    65C8 C8C4C240E2D5E340 65D1 8511 MB3     DC    CL10'HDB SNS NG'
    65D0 D5C7             8511
    65D2 C2E2C3C160D9C6C1 65DB 8512 MB4     DC    CL10'BSCA-READY'
    65DA C4E8             8512
    65DC C1C360D5D660C9D5 65E5 8513 MB5     DC    CL10'AC-NC-INT '
    65E4 E340             8513
    65E6 F1               65E6 8514 DECONE  DC    CL1'1'          .DECIMAL ONE
    65E7 4040404040404040 65F0 8515 BLANKS  DC    10CL1' '
    65EF 4040             8515
    65F1 00               65F1 8516 ERRRTN  DC    XL1'0'
    65F2 00               65F2 8517 ERRHLT  DC    XL1'0'
    65F3 01               65F3 8518 IPLFLG  DC    XL1'01'         .ROUTINE FLAG FOR PROC. CHK.
    65F4 0000             65F5 8519 UNFRTN  DC    XL2'0'
    65F6 0000             65F7 8520 UNPHLT  DC    XL2'0'
    65F8 4040404040404040 6601 8521 ERRLOG  DC    10CL1' '
    6600 4040             8521
                          8522
    6602 C0 87 64C2       8523 ELLINK B     ELPORT          .EXTERNAL LINKAGE BRANCH
    6606 C0 87 4D37       8524 TERLNK B     LNKTER          .EXTERNAL LINKAGE BRANCH
    660A E2F8F0F0C6F0F0F0 6613 8525 ULOG1   DC    CL10'S800F0000-'
    6612 F060             8525
    661A D4D9C5F0F0F1F6F0 661D 8526 ULOG2   DC    CL10'MRE00160E-'
    661C C560             8526
    661E D4D9C5F0F0F0C8F1 6627 8527 ULOG3   DC    CL10'MRE000E16-'
    6626 F660             8527
    6628 C3C1E4E3C9D6D540 6652 8528         DC    CL43'CAUTION - INCORRECT UDT AND/OR HARDWARE FOP'
    6630 6040C9D5C3D6D5D9 8528
    6638 C5C3E340E4C4F340 8528
    6640 C1D5C461D6D94CC8 8528
    6648 C1D9C4E6C1D9C540 8528
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8912 DISPLAY ADAPTER TEST

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    6650 C6D6D9                8528
    6653 40D4D6C4C5D340F2 6676 8529 UDTMSG DC    CL36' MODEL 2 SUPPORT CAN CAUSE THIS HALT'
    665B 40E2E4D7D7D6D5E3      8529
    6663 40C3C1D540C3C1E4      8529
    666B E2C540E3C8C9E340      8529
    6673 C8C1D3E3              8529
                               8530
                               8531 ********************
                               8532 * PROGRAM EQUATES ************************************************************
                               8533 ********************
                               8534
                          5A00 8535 SAVARR EQU   RETBR+3
                          59F8 8536 SAVXR1 EQU   RESTOR+3
                          59FC 8537 SAVXR2 EQU   RESTOR+7
                               8538
                          0001 8539 XR1    EQU   X'01'
                          0002 8540 XR2    EQU   X'02'
                          0004 8541 PSR    EQU   X'04'
                          0008 8542 ARR    EQU   X'08'
                          0222 8543 HALT   EQU   X'222'
                          0080 8544 SSW10  EQU   X'80'
                          0040 8545 SSW11  EQU   X'40'
                          0020 8546 SSW12  EQU   X'20'
                          0010 8547 SSW13  EQU   X'10'
                          0008 8548 SSW14  EQU   X'08'
                          0004 8549 SSW15  EQU   X'04'
                          0002 8550 SSW16  EQU   X'02'
                          0001 8551 SSW17  EQU   X'01'
                          0008 8552 SSW1C  EQU   X'08'
                          0001 8553 SSW1F  EQU   X'01'
                          0002 8554 SSW2E  EQU   X'02'
                          0001 8555 SSW2F  EQU   X'01'
                          0200 8556 MODTYP EQU   X'200'
                          0208 8557 SBYTE0 EQU   X'208'
                          020A 8558 SBYTE2 EQU   X'20A'
                          020B 8559 SBYTE3 EQU   X'20B'
                          020D 8560 SBYTE5 EQU   X'20D'
                          0212 8561 TEST   EQU   X'212'
                          021A 8562 PRINT  EQU   X'21A'
                          0216 8563 LINK   EQU   X'216'
                          022A 8564 LOAD   EQU   X'22A'
                          021E 8565 UNPACK EQU   X'21E'
                          0020 8566 P1IAR  EQU   X'20'            PROGRAM 1 IAR
                          00C0 8567 IAR1   EQU   X'C0'            INTERRUPT LEVEL 1 IAR
                          00A0 8568 IAR2   EQU   X'A0'
                               8569
                               8569
                          0049 8570 IN32CA EQU   X'49'            TIO 32CA INST.
                          004C 8571 BSCAEM EQU   X'4C'            TIO BSCA/3271 EMUL. INST.
                          0058 8572 NOTRDY EQU   X'58'            TIO NOT READY
                          0059 8573 INTPND EQU   X'59'            TIO INTERRUPT PENDING
                          005D 8574 ATTCHK EQU   X'5D'            TIO ATTACHMENT CHECK
                          005B 8575 CSCHK  EQU   X'5B'            TIO C.S. DATA CHECK
                          005E 8576 FETWRD EQU   X'5E'            TIO C.S. WRITE DATA CHECK
                          005C 8577 FETADR EQU   X'5C'            TIO C.S. ADDRESS CHECK
                          005A 8578 HDBCHK EQU   X'5A'            TIO HDB/EXT CHECK
                          005F 8579 BUSY   EQU   X'5F'            TIO ATTACHMENT BUSY
                          0048 8580 HDB0   EQU   X'48'            LIO/SNS HDB 10-11
                          0049 8581 HDB1   EQU   X'49'            LIO/SNS HDB 12-13
                          004A 8582 HDB2   EQU   X'4A'            LIO/SNS HDB 14-15
                          004B 8583 HDB3   EQU   X'4B'            LIO/SNS HDB 16-17
                          004C 8584 HDB4   EQU   X'4C'            LIO/SNS HDB 18-19
                          004D 8585 HDB5   EQU   X'4D'            LIO/SNS HDB 1A-1B
                          004E 8586 HDB6   EQU   X'4E'            LIO/SNS HDB 1C-1D
                          004F 8587 HDB7   EQU   X'4F'            LIO/SNS HDB 1E-1F
                          0058 8588 CTSTOR EQU   X'58'            LIO/SNS CONTROL STORAGE
                          0059 8589 OPDEC  EQU   X'59'            LIO OP DECODE REGS
```

8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         0058 8590 MSDAR  EQU   X'58'                  LIO/SNS CRT LS ADDR REG (CRTAR)
                         0058 8591 SICI   EQU   X'58'                  SIO IMMEDIATE
                         0048 8592 SIONI0 EQU   X'48'                  SIO NON-IMMEDIATE LINE 0
                         0049 8593 SIONI1 EQU   X'49'                  SIO NON-IMMEDIATE LINE 1
                         008C 8594 BSDAR  EQU   X'8C'                  LIO/SNS BSCA 2 ADDR REG(BSCAR)
                              8595         TREP
                              8596 *            SECTION 891  -  ISYS/3 DISPLAY ADAPTER TEST
                              8597         TREP
                              8598 ************************************************************************
                              8599         TREP
                              8600 * SSW 10 ON PRINTS HDB'S IN ROUTINE 04 AND 05                        *
                              8601         TREP
                              8602 * SSW 12 ON PRINTS CONTROL STORAGE IN ROUTINE 07                     *
                              8603         TREP
                              8604 * SSW 17 ON BYPASSES CONTROL STORE LOAD FOR A TIGHT LOOP WHILE      *
                              8605         TREP
                              8606 *          LOOPING ROUTINES.                                        *
                              8607         TREP
                              8608 * SSW 1C ON CAUSES ROUTINE 24 TO BE SKIPPED.                        *
                              8609         TREP
                              8610 * MANUAL SELECTION ROUTINES-                                       *
                              8611         TREP
                              8612 *      ROUTINE 41 - C.E. MANUAL MICROPROGRAM                        *
                              8613         TREP
                              8614 *      ROUTINE 42 - C.E. TEST BOX CHECK OUT ROUTINE                 *
                              8615         TREP
                              8616 *      ROUTINE 43 - HDB AND CONTROL STORE DUMP UTILITY              *
                              8617         TREP
                              8618 * WARNING - THIS SECTION DESTROYS THE MICROCODE REQUIRED FOR SYSTEM  *
                              8619         TREP
                              8620 *          OPERATION. RUN SECTION 893 TO RELOAD.                    *
                              8621         TREP
                              8622 ************************************************************************
```


8912 DISPLAY ADAPTER TEST

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         FFFF 8624         END
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ACHCHK	A	004	51F7	7108	7103
ACTERR	A	001	62E6	8331	8271* 8273* 8275* 8277* 8279* 8281* 8286 8291 8297 8311
ACTR3F	A	002	4A56	6571	6547* 6548
ADDNO	A	006	49FE	6550	
ADDYES	A	006	4A26	6559	6549
ADRA00	A	004	1550	1015	1008
ADRB00	A	004	1569	1023	1016
ADRC00	A	004	1582	1031	1024 1032
ADRMSG	A	028	449F	6259	6250 6254
ADR100	A	004	1467	0941	
ADR200	A	004	1480	0949	0942
ADR300	A	004	1499	0957	0950
ADR400	A	004	14B2	0965	0958
ADR500	A	004	14CB	0973	0966
ADR600	A	004	14E4	0981	0974
ADR700	A	004	14FD	0989	0982
ADR800	A	004	1516	0997	0990
ADR900	A	004	1537	1007	0998
AEH3C	A	002	398C	5588	5578
AEH39	A	002	398A	5587	5567
AGAIN	A	004	5C44	7871	7882
AGAIN1	A	004	10E1	0676	0687
ARR	C	001	0008	8542	0643 0649 1175 6222 6534 6966 7159 7328 7332 7386 7578 7793 7838 7844 7915 7998 8255 8266 8334 8368 8396
ATTCHK	C	001	005D	8574	0073 0225 0236 0454 0465 0890 1054 1079 1104 1253 7038 7815 8124 8280
ATTFLG	A	001	61B0	8211	0224* 0226* 0238 0453* 0455* 0467 8013* 8206*
ATTMA	A	002	61A2	8205	
BADDR	A	002	5A05	7658	7587 7588
BADTIO	A	004	4C42	6743	6742
BCYST	A	001	3BB6	5860	5863
BCYSTA	A	004	3BB9	5861	5775* 5799 5801 5807 5809
BCYSTL	A	002	3BBC	5863	5782 5830 6807
BLANKS	A	001	65F0	8515	8041 8099 8261
BLOCK2	A	004	5A4E	7689	7625
BLOCK3	A	004	5A5F	7695	7690
BLOCK4	A	004	5A70	7701	7696
BLOCK5	A	004	5A81	7707	7702
BLOCK6	A	004	5A9B	7715	7710
BLOCK7	A	004	5AAD	7721	7716
BLOCK8	A	004	5ABF	7727	7722
BLOCK9	A	004	5AD1	7733	7708 7728
BLOK10	A	004	5AE8	7741	7736
BLOK11	A	004	5AFD	7747	7742
BLOK12	A	004	5B0F	7753	7748
BLOK13	A	004	5B21	7759	7734 7754
BLOK14	A	004	5B3B	7767	7762
BLOK15	A	004	5B4D	7773	7768
BLOK16	A	004	5B5F	7779	7774
BOSADR	A	002	5A4C	7686	7631* 7632* 7633
BRUO	A	002	5DA4	7961	
BSCAEM	C	001	004C	8571	
BSDAR	C	001	008C	8594	5782* 5830* 6807*
BSSER2	A	004	3B86	5837	5828
BSYERR	A	004	3743	5316	5307
BSYER1	A	004	3B14	5790	5780
BSYER2	A	004	3772	5336	5328
BSYER3	A	004	3B8E	5842	5851
BUSY	C	001	005F	8579	6724*
B8910	A	001	0000	0004	
CB12	A	004	54D6	7295	7292
CCYSTL	A	002	3BBE	5864	
CHKBLK	A	004	644C	8422	8420* 8421 8425 8427*
CHKEND	A	006	6458	8425	8423
CKFFN	A	004	4815	6474	6473*
CKFFN1	A	004	4828	6481	6480* 6483 6493* 6494

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
CKFFY	A	004	47C5	6448	6447*
CKFFY1	A	004	47D3	6451	6450* 6453 6463* 6464
CKHIZ	A	004	5E7D	8064	8061
CKLOW	A	004	5E6A	8060	8057
CKLOWZ	A	004	5E90	8068	8065
CLRBLK	A	004	6454	8424	8421*
COAX1	A	013	44DC	6261	6238
COAX2	A	012	4510	6263	6242
COAX3	A	039	4537	6264	6246
CONTUE	A	004	2C1D	3808	
CSCHK	C	001	005B	8575	0079 0081 8278
CSLD	A	001	5A08	7660	7608 7610* 7647*
CSWORD	A	002	5A02	7656	7602* 7620* 7624 7631 7634* 7635 7643* 7689 7695 7701 7709 7715 7721 7727 7735 7741 7747 7753 7761 7767 7773 7779
CTSTOR	C	001	0058	8588	0172* 0757* 0775* 0817* 0820 0823* 0826 0866* 0886 1050 1075 1100 1243* 1246* 1262 2835* 3624* 3634* 3669 3670* 3673 3682 3687* 3695* 6955* 6956* 6957* 6971* 6975* 6978* 6982* 7034 7347 7618* 7633*
DECONE	A	001	65E6	8514	8407
DEC3D	A	002	4AC2	6600	6276
DEC3E	A	002	4AC4	6601	6282
DEC33	A	002	359F	5106	5083
DEC34	A	002	35A1	5107	5089
DEC35	A	002	35A3	5108	5095
DELAY	A	006	551F	7341	7345
DEVADR	A	001	4538	6265	5993* 5999* 6005* 6016* 6022* 6028* 6039* 6045* 6051* 6062* 6068* 6074* 6085* 6091* 6097* 6108* 6114* 6120* 6131* 6137* 6143* 6154* 6160* 6166* 6177* 6183* 6189* 6200* 6206* 6212* 6249
DEVID	A	001	61AF	8210	0060* 8073
DEV3F	A	001	4A4E	6567	6310* 6314* 6317* 6324* 6327* 6330* 6337* 6341* 6344* 6351* 6354* 6357* 6364* 6368* 6371* 6378* 6381* 6384* 6391* 6395* 6398* 6405* 6408* 6411* 6418* 6422* 6425* 6432* 6435* 6438* 6454* 6457 6484* 6487 6556 6565
DISERR	A	004	37D9	5367	5342
DOHIS	A	004	5C65	7884	7880
DOHIS1	A	004	1102	0689	0685
DOMICR	A	004	54FE	7332	1278 1284 1374 1441 1556 1632 1698 1760 1823 1887 1943 1999 2083 2212 2303 2383 2433 2489 2603 2665 2725 2766 2853 2958 3010 3071 3152 3224 3320 3486 3520 3626 3636 3765 3785 3813 3837 3871 3898 4057 4063 4074 4172 4267 4418 4470 4517 4564 4662 4761 4899 4998 5133 5138 5143 5191 5197 5202 5207 5212 5217 5303 5321 5324 5502 5659 5663 5683 5776 5795 5846 5852 5985 6230 6899
DOMIC2	A	004	54EF	7328	
DOMIRA	A	004	555F	7360	7328* 7332* 7336 7356*
DOMIX1	A	004	555B	7359	7335*
DORT42	A	004	296E	3480	3478
DOR3C	A	006	402C	5976	5971
EADDR	A	002	5A07	7659	7580* 7588* 7590* 7621*
EHBP	A	001	554D	7352	1275* 2851* 3317* 3760* 3780* 3808* 3832* 3866* 3893* 4266* 4417* 4469* 4516* 6229* 7357*
EH3C	A	004	397A	5580	5588
EH39	A	004	395C	5569	5587
ELLINK	A	004	6602	8523	8458
ELPFLD	A	017	64E5	8461	8408* 8415 8416 8438 8465 8466
ELPFST	A	015	64D4	8460	0061* 8125 8407* 8414
ELPO	A	004	63FE	8396	2887 3361 6509 6825 7237 7816 8152 8318
ELPORE	A	004	64BE	8458	8446 8449 8453
ELPORT	A	004	64C2	8459	8396* 8406 8523
EMPTYE	A	004	4802	6466	6449
ENDFIL	A	003	59DB	7639	7609 7627 7692 7698 7704 7712 7718 7724 7730 7738 7744 7750 7756 7760 7764 7770 7776 7780 7782
ENDNO	A	004	485A	6496	6482
ENDYES	A	004	480A	6471	6452
END3F	A	004	4887	6512	6475
ERHC1	A	002	6298	8303	8260*
ERHC2	A	002	62D2	8322	8264*
ERRHLT	A	001	65F2	8517	2885* 6506* 6817* 6819 7806* 8044* 8262* 8399

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ERRLOG	A	001	6601	8521	0015 2883* 2884* 3332* 3336* 3340* 3354* 3355* 3356* 6508* 6648* 6670* 6810* 6814* 6823 7163* 7164* 7208* 7209* 7214* 7218 7224* 7291* 7294* 7814* 8041* 8042* 8043* 8048* 8049* 8052* 8053* 8058* 8059* 8062* 8063* 8066* 8067* 8070* 8071* 8079* 8080* 8081* 8086* 8087* 8090* 8093* 8098* 8099* 8109* 8115* 8143* 8146* 8148* 8183* 8261* 8288* 8317* 8364* 8408
ERRPOE	A	001	63FB	8385	8269* 8270 8270* 8372 8373* 8374 8374*
ERRPOS	A	001	63D7	8384	8337* 8338* 8342* 8343* 8347* 8348* 8349* 8353* 8354* 8358* 8359* 8363*
ERRRTN	A	001	65F1	8516	2886* 6507* 6818* 7807* 8045* 8263* 8403 8443 8448
ERRT	A	004	62E1	8328	8255* 8257 8258* 8266* 8295
ERRO	A	004	625D	8284	8280
ERR1	A	004	6255	8280	8278
ERR2	A	004	624D	8278	8276
ERR3	A	004	6245	8276	8274
ERR4	A	004	623D	8274	8272
EXERR	A	001	62E5	8330	8259* 8268* 8289 8297 8304 8315
EXPR3F	A	002	4A54	6570	6548
EOOFF	A	002	1981	1386	1372 1380
E55AA	A	002	1995	1395	1389
FETADR	C	001	005C	8577	0223 0452 0868 6687 6706 8274
FETWRD	C	001	005E	8576	0077 0222 0451 0867 8276
FET3IN	A	004	152B	1003	1000
FILLCS	A	004	59B0	7624	7616 7637
FILLFF	A	006	59C1	7631	7628 7636 7693 7699 7705 7713 7719 7725 7731 7739 7745 7751 7757 7765 7771 7777 7783
FOUR	A	001	5A11	7667	7586 7796
GET1KB	A	006	595A	7596	7595*
GOELPD	A	004	5FBF	8152	1298 8141 8144 8147 8150
HALT	C	001	0222	8543	2888 3366 6510 6537 6642 6657 6664 6683 6702 6720 6738 6755 6775 6798 6828 6931 6940 6944 6947 6950 7240 7819 8157 8321
HAVINT	A	003	38E2	5513	5507
HCADR	A	002	5C3B	7866	7848*
HDADR1	A	002	10D8	0671	0653*
HDBA	A	002	0D53	0356	0260* 0297* 0314* 0317 0372* 0489* 0602* 8019 8024
HDBAC	A	002	0FEC	0587	0526* 0543* 0546
HDBCHK	C	001	005A	8578	0078 0303 0321 0532 0550 8272
HDBER1	A	004	37E1	5372	5351
HDBER2	A	004	37E9	5377	5356
HDBH	A	004	5BE7	7838	0325 7014
HDBH1	A	004	1084	0643	0554 7016
HDBL	A	004	5BF9	7844	0327 7013
HDBL1	A	004	1096	0649	0556 7015
HDBST	A	002	0D5F	0363	0205* 0286 0297 0301 0324 0326 0340 0342*
HDBSTC	A	002	0FF6	0592	0434* 0515 0526 0530 0553 0555 0569 0571*
HDB0	C	001	0048	8580	0161 0243* 0244 0245* 0246 0288 0298 0369 1372* 1379 1439* 1552* 1561 2658* 2660* 3222* 3316* 3329 3485* 3500* 3646* 3653* 3658* 4067* 4264* 4415* 4467* 4514* 4993* 5983* 6227* 7166 7850
HDB1	C	001	0049	8581	1373* 1388 1553* 1569 1630* 1645 3330 3492* 3501* 3642* 4068* 4767 7167 7851
HDB2	C	001	004A	8582	1554* 1577 1629* 1637 3331 3493* 3502* 3615* 3618 3643* 3763* 3783* 3811* 3835* 3869* 3896* 4069* 6634* 6636 6652* 7168 7852
HDB3	C	001	0048	8583	1695* 1703 2844* 2859 2861 3494* 3503* 3764* 3784* 3812* 3836* 3870* 3897* 4070* 5343* 5349 7169 7853
HDB4	C	001	004C	8584	1696* 1711 2850* 3495* 3504* 4071* 6547 7854
HDB5	C	001	004D	8585	3228 3496* 3505* 4061* 4765 7855
HDB6	C	001	004E	8586	3497* 3506* 4072* 7856
HDB7	C	001	004F	8587	0163 0294 0318 0744* 0745 0758 0864 0869 3498* 3507* 4073* 7857
HDB900	A	002	303A	4366	4255 4406 4458 4505 5976
HDB901	A	002	3038	4365	6042 6105 6163 6342 6379 6412
HDB902	A	002	3036	4364	6036 6094 6157 6339 6372 6409
HDB904	A	002	3034	4363	6025 6088 6151 6209 6331 6369 6406 6439
HDB908	A	002	3032	4362	6019 6082 6140 6203 6328 6365 6399 6436
HDB910	A	002	3030	4361	6013 6071 6134 6197 6325 6358 6396 6433
HDB920	A	002	302E	4360	6002 6065 6128 6186 6318 6355 6392 6426
HDB940	A	002	302C	4359	5996 6059 6117 6180 6315 6352 6385 6423
HDB980	A	002	302A	4358	5990 6048 6111 6174 6311 6345 6382 6419
HDNG	A	047	5CBE	7901	7846 7866

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
HDNGA	A	047	5CF4	7903	7840
HDNGA1	A	047	1191	0708	0645
HDNGB	A	047	5D2A	7905	7868 7887
HDNGB1	A	047	11C7	0710	0673 0692
HDNGMA	A	012	5D37	7907	7862
HDNGM1	A	012	11D4	0712	0667
HDNG1	A	047	115B	0706	0651 0671
HDXX1	A	002	11D6	0713	
HD1	A	002	5C7A	7892	7850* 7869
HD11	A	002	1117	0697	0655* 0674
HD2	A	002	5C7C	7893	7851*
HD21	A	002	1119	0698	0656*
HD3	A	002	5C7E	7894	7852*
HD31	A	002	111B	0699	0657*
HD4	A	002	5C80	7895	7853*
HD41	A	002	111D	0700	0658*
HD5	A	002	5C82	7896	7854*
HD51	A	002	111F	0701	0659*
HD6	A	002	5C84	7897	7855*
HD61	A	002	1121	0702	0660*
HD7	A	002	5C86	7898	7856*
HD71	A	002	1123	0703	0661*
HD8	A	002	5C88	7899	7857*
HD81	A	002	1125	0704	C662*
HIBITS	A	004	548E	7275	7272
HOLD1	A	002	0DEC	0404	0244* 0249 0253 0255 0261 0473* 0478 0482 0484 0490 0820* 0827 0831 0835 0841
HOLD2	A	002	0DEE	0405	0246* 0249 0253 0255 0266 0475* 0478 0482 0484 0495 0826* 0827 0831 0835 0846
IAR1	C	001	00C0	8567	
IAR2	C	001	00A0	8568	5476* 5524*
INCFLC	A	001	0FF7	0593	0435* 0514* 0519 0528 0544 0572*
INCFLG	A	001	0D60	0364	0206* 0285* 0290 0299 0315 0343*
INSWR	A	004	5A4A	7684	
INTEX1	A	004	3964	5574	5566
INTEX2	A	003	3982	5585	5577
INTFLG	A	001	394C	5561	5473* 5477* 5494* 5497 5523* 5527 5565 5574* 5576
INTPND	C	001	0059	8573	
INT38	A	004	394D	5565	5560 5586
INT38A	A	002	3948	5560	5476 5524
IN32CA	C	001	0049	8570	
IOCHKN	A	003	4B20	6633	
IOCHKO	A	004	4855	6652	6647
IPLFLG	A	001	65F3	8518	6614 6832 8405
KATM	A	029	18FC	1339	1274* 1283* 1293
KATMA	A	043	1938	1341	1297
KATMM	A	020	1910	1340	1274 1283
LABEL	A	004	0A24	0052	0051
LABELR	A	004	0A2C	0054	0053
LCSDIS	A	003	596A	7600	
LCSENA	A	003	596D	7601	
LDOP	A	004	5D38	7915	0204 0240 0433 0469 3603 3612 6892 6928 7012 7027 7614
LFLAG	A	001	5A03	7657	7584 7593 7598 7612 7615 7626 7639 7691 7697 7703 7711 7717 7723 7729 7737 7743 7749 7755 7763 7769 7775 7781
LINK	C	001	0216	8563	0074 0088 0109 0115 0121 0127 0133 0139 0176 0371 0601 0779 1143 1289 1300 1397 1445 1585 1653 1719 1764 1827 1891 1947 2003 2087 2216 2307 2387 2437 2492 2668 2729 2769 2857 2890 2961 3013 3074 3155 3252 3325 3368 3523 3703 3744 3849 3904 4025 4078 4108 4136 4176 4274 4425 4479 4524 4568 4666 4776 4903 5002 5102 5146 5220 5365 5530 5682 5691 5858 6012 6035 6058 6081 6104 6127 6150 6173 6196 6215 6256 6512 6833 7821 8159 8324
LIOCS	A	003	599F	7618	7576 7581 7622
LISELA	A	002	303C	4369	4256 4407 4459 4506 5977 5991 5997 6003 6014 6020 6026 6312
LISELB	A	002	303E	4370	6037 6043 6049 6060 6066 6072 6338
LISELC	A	002	3040	4371	6083 6089 6095 6106 6112 6118 6366

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
LISELD	A	002	3042	4372	6129 6135 6141 6152 6158 6164 6393
LISELE	A	002	3044	4373	6175 6181 6187 6198 6204 6210 6420
LNKTER	A	004	4D37	6835	6623 8524
LOAD	C	001	022A	8564	6835 6903 7110
LOADCS	A	004	5918	7577	1270 1365 1432 1545 1622 1689 1754 1817 1881 1937 1993 2066 2070 2074 2078 2203 2207 2297 2377 2427 2473 2477 2481 2485 2599 2661 2714 2719 2750 2755 2760 2839 2953 3005 3066 3144 3148 3215 3305 3480 3516 3594 3665 3701 3749 3753 3755 3775 3794 3798 3803 3822 3826 3850 3854 3857 3860 3880 3884 3887 4051 4162 4258 4400 4409 4461 4508 4557 4655 4754 4892 4987 5129 5187 5299 5467 5517 5635 5769 5979 6223 6539 6778 6801 6894
LOAD1	A	003	5D47	7919	7922
LOAD2	A	004	5D5E	7926	7915*
LOGADL	A	002	650D	8465	8420
LOGADR	A	002	650F	8466	8425
LOGHLT	A	010	64F9	8463	8416* 8437
LOGLOG	A	018	650B	8464	8438* 8442 8445 8450 8452
LOGROU	A	010	64EF	8462	8415* 8433
LOGXAC	A	004	5FA7	8143	8130 8132
LOGYAC	A	004	5FAF	8146	8134 8136
LOGZAC	A	004	5FB7	8149	8138 8140
LOOK	A	005	5BAC	7809	7812
LOOP10	A	006	6446	8421	8428
LPCNT	A	002	5564	7362	2724* 2765* 2852* 3223* 3318* 3761* 3781* 3809* 3833* 3867* 3894* 4265* 4416* 4468* 4515* 4563* 4661* 4760* 4898* 5984* 6228* 7342 7344*
MAL	A	010	658B	8504	6478
MBL	A	010	6595	8505	8480
MBO	A	010	6583	8508	8486
MB1	A	010	658D	8509	8488
MB2	A	010	65C7	8510	8490
MB3	A	010	65D1	8511	8492
MB4	A	010	65DB	8512	8494
MB5	A	010	65E5	8513	8496
MFIND	A	005	5BBB	7813	7810
MICEN	A	003	551C	7340	7329* 7333*
MICERR	A	004	5549	7351	
MICOM	A	004	550A	7335	7331
MICOP	A	011	5A38	7682	1359* 1426* 1539* 1616* 1682* 1748* 1812* 1875* 1931* 1987* 2197* 2291* 2371*
MICPRT	A	014	5A46	7683	1363 1430 1543 1620 1686 1752 1816 1879 1935 1991 2201 2295 2375
MODTYP	C	001	0200	8556	
MuPD	A	010	65A9	8507	8484
MSDAR	C	001	0058	8590	
MTABLE	A	002	6511	8467	7808
MVHLT	A	006	5343	7236	7162
MVLG	A	006	5BC0	7814	7813*
M1L	A	010	659F	8506	8482
M5L	A	010	656D	8501	8472
M6L	A	010	6563	8500	8470
M7L	A	010	6559	8499	8468
M8L	A	010	6581	8503	8476
M9L	A	010	6577	8502	8474
NEG3	A	002	545E	7260	7270 7281
NEXT	A	004	547D	7270	7267
NHADR	A	002	61E1	8232	8228*
NOHANG	A	006	4CEA	6810	6762 6785 6808
NOPC	A	006	4CF8	6814	6688 6707 6726 6743
NORC	A	004	52C1	7188	7181 7185
NORC1	A	004	5324	7226	7222
NOTHI	A	004	5E3F	8050	8047
NOTLO	A	005	5E52	8055	8051
NOTRDY	C	001	0058	8572	0066 0216 0445 1256
NP4	A	003	5EF0	8094	8092
NTFE1	A	010	4ED0	6851	6648 6670

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
NTFE2	A	010	4EDA	6852	6810
NTFE4	A	010	4EE4	6853	6814
NTFHLT	A	002	4D2A	6829	6649* 6671* 6811* 6815* 6817
NTFIDE	A	002	4D1B	6824	6819*
NTFLIO	A	003	4EED	6856	6711
NTFLOG	A	006	4D02	6817	6650 6672 6812
NTFM1	A	016	4DA4	6841	6627
NTFM2	A	033	4DC5	6842	6631
NTFM3	A	026	4DDF	6843	6641
NTFM4	A	037	4E04	6844	6656
NTFM5	A	027	4E1F	6845	6663
NTFM7	A	049	4E50	6846	6682 6701 6719 6737 6754 6774 6797
NTFM8	A	014	4E89	6848	6674* 6678 6693* 6697 6711* 6715 6729* 6733
NTFM9	A	028	4EC6	6850	6746* 6750 6766* 6770 6789* 6793
NTFRST	A	004	4BB5	6690	0050
NTFSIO	A	003	4EE7	6854	6674
NTFSNS	A	003	4EEA	6855	6693
NTFTIO	A	003	4EF0	6857	6729
NXT111	A	004	390D	5527	5526
NXT38	A	004	38BE	5497	5496
OPDEC	C	001	0059	8589	0230* 0459* 3597* 3606* 5520* 7919*
OPDECD	A	002	0DF0	0406	0229* 0230 0231* 0232 0458* 0459 0460* 0461
OPDECF	A	017	0E01	0407	0385 0615 8483
OPTDEF	C	001	0A08	7496	
PADCHK	A	004	6198	8202	8124
PAR	A	001	545C	7259	7263* 7269* 7280* 7287* 7295
PASTCS	A	001	38BA	5862	5774 5774* 5817 5820
PCHK	A	004	6218	8266	7815 8207
PERR	A	004	6380	8368	8339 8344 8350 8355 8360 8365
PERRT	A	004	6396	8375	8368*
PIOADR	A	002	5342	7234	7220* 7230*
PIOB1	A	004	5299	7175	7170
PIOB2	A	004	52AB	7180	7175
PIOEH	A	002	5357	7241	7236*
PIOHLT	A	004	5349	7237	
PIOLTH	A	001	5340	7233	7223* 7226* 7229*
PIOL1	A	002	5455	7255	7166* 7171
PIOL2	A	002	5457	7256	7167* 7206
PIOL3	A	002	5459	7257	7168* 7180 7221
PIOREG	A	004	525A	7159	4272 4423 4475 4522 6255
PIORTN	A	004	535C	7244	7159*
PIOWK1	A	002	545B	7258	7171* 7176* 7212 7217 7264 7275 7282 7288
PIOXR1	A	004	5358	7243	7160*
PLAST	A	004	5328	7227	7225
PLASTA	A	004	533B	7231	7228
PM3	A	002	5B9C	7805	7797* 7799* 7809
PM4	A	002	5BD8	7820	7798*
PM5	A	004	5BE1	7824	7793* 7795 7796*
POERR	A	004	62E8	8334	8292 8305 8312
POERRT	A	004	637C	8366	8334* 8362
POFLG	A	001	62E7	8332	8291* 8304* 8311* 8335 8340 8345 8351 8356 8361
POLLNO	A	001	4A96	6573	6306* 6307 6307* 6569
POLLNR	A	010	49C5	6524	6508
POLLYE	A	001	4A76	6572	6304* 6305 6305* 6568
POLL3F	A	004	49C6	6534	6313 6316 6319 6326 6329 6332 6340 6343 6346 6353 6356 6359 6367 6370 6373 6380 6383 6386 6394 6397 6400 6407 6410 6413 6421 6424 6427 6434 6437 6440 6545 6545
POLNA	A	002	4A50	6568	6473 6480 6550
POLYA	A	002	4A52	6569	6447 6450 6559
PRBCS	A	001	38B5	5859	5815 5819
PRINT	C	001	021A	8562	0054 0097 0129 0154 0199 0428 0664 0668 0689 0732 0806 1220 1290 1294 1360 1427 1540 1617 1683 1749 1813 1876 1932 1988 2061 2198 2292 2372 2422 2467 2593 2708 2826 2871 2875 2879 2947 2999 3060 3138 3210 3300 3357 3362 3474 3589 3738 4021 4046 4104 4132 4157 4250 4395 4450 4500 4552 4650 4749 4887 4982 5098 5123 5181 5293 5460 5628 5763 5967 6235 6239 6243

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
					6251 6298 6443 6459 6466 6471 6476 6489 6496 6498 6502 6616
					6624 6628 6638 6653 6660 6675 6679 6694 6698 6712 6716 6730
					6734 6747 6751 6767 6771 6790 6794 6820 6826 6879 6883 6887
					6924 7007 7124 7188 7192 7196 7200 7231 7238 7416 7445 7455
					7801 7817 7859 7863 7884 8118 8154 8202 8229 8293 8299 8307
					8319 8369 8409 8411 8430 8434 8439 8454
PRINTM	A	004	5B72	7793	0068 0083 0111 0117 0123 0135 0217 0382 0388 0446 0612 0618
					1325 1331 5311 5316 5332 5336 5367 5372 5377 5382 5386 5482
					5488 5508 5532 5538 5542 5547 5552 5569 5580 5641 5652 5672
					5678 5693 5698 5785 5790 5833 5837 5842
PRTABL	A	004	4787	6443	6323 6336 6350 6363 6377 6390 6404 6417 6431 6441
PRTLOG	A	004	646C	8430	8426
PRTN	A	001	0A03	0012	0348 0577 4477 6690* 7227 7608 7610 7807 8045 8263
PSR	C	001	0004	8541	1178 1179* 1200* 7389 7390* 7457* 8003 8004* 8161*
PXR1	A	004	5BDD	7823	7794*
PO3FEX	A	004	4A4A	6566	6534* 6557
P1	A	005	5B84	7797	
P1IAR	C	001	0020	8566	5567* 5578*
RAPEXP	A	002	4445	6232	6233
RENTRY	A	001	4EF1	6858	0048 0049* 6686* 6691 6705* 6709 6723* 6727 6740* 6744 6758* 6764
					6783* 6787 6806*
RENT3	A	004	4BE8	6709	6692
RENT4	A	004	4C46	6744	6728
RENT4A	A	004	4C17	6727	6710
RENT5	A	004	4C73	6764	6745
RENT6	A	004	4CAE	6787	6765
REPEAT	A	005	5512	7337	0215 0215 0235 0235 0444 0444 0464 0464 4169 4169 6936 6936
					6960 6960 7341 7341
REST	A	006	5551	7356	7349
RESTOR	A	004	59F5	7648	7646 8536 8537
RESTR	A	004	59E8	7645	7640
RETBR	A	004	59FD	7650	8535
RSTRT	A	003	62DA	8326	8298
RTN	A	003	54E6	7300	7298
RTOA	A	001	19AA	1419	1354
RTOAOP	A	006	185A	1655	1616
RTOB	A	001	1A68	1532	1421
RTOBOP	A	006	1BC9	1721	1682
RTOC	A	001	1AF6	1609	1534
RTOCOP	A	006	1C02	1766	1748
RTOD	A	001	1B65	1675	1611
RTODOP	A	006	1C61	1829	1812
RTOE	A	001	1BD4	1741	1677
RTOEOP	A	006	1D66	2005	1987
RTOF	A	001	1C33	1805	1743
RTOFOP	A	006	1D17	1949	1931
RTOOO	A	002	5077	6991	6982
RTO1	A	001	0A10	0044	0014
RTO2	A	001	0A8D	0094	0046
RTO3	A	001	0805	0150	0096
RTO4	A	001	086C	0195	0152
RTO5	A	001	0E02	0424	0197
RTO6	A	001	11D7	0728	0426
RTO7	A	001	1287	0802	0730
RTO7OP	A	006	199F	1399	1359
RTO8	A	001	173C	1216	0804
RTO8OP	A	006	19DE	1447	1426
RTO9	A	001	193C	1352	1218
RTO9OP	A	006	1AE7	1587	1539
RT1A	A	001	2228	2705	2591
RT1B	A	001	22F1	2822	2707
RT1BOP	A	021	2E4A	4080	4049
RT1C	A	001	248D	2943	2824
RT1D	A	001	24FF	2995	2945
RT1E	A	001	2583	3056	2997
RT1EOP	A	029	2EE5	4178	4160

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RT1F	A	001	2634	3134	3058
RT1FOP	A	025	2FA6	4276	4253
RT1ST	A	022	0A8C	0090	0057
RT10	A	001	1C9A	1868	1807
RT10OP	A	006	1CC8	1893	1875
RT11	A	001	1CE9	1924	1870
RT12	A	001	1D38	1980	1926
RT12OP	A	006	1ECA	2218	2197
RT13	A	001	1D89	2054	1982
RT13OP	A	006	1F55	2309	2291
RT14	A	001	1E93	2190	2056
RT14OP	A	006	1FD2	2389	2371
RT15	A	001	1F27	2284	2192
RT15OP	A	029	2025	2439	2425
RT16	A	001	1FA4	2364	2286
RT16OP	A	024	2749	3254	3213
RT17	A	001	1FE5	2415	2366
RT17OP	A	039	286D	3374	3303
RT18	A	001	2042	2463	2417
RT18OP	A	024	287F	3710	3592
RT19	A	001	2152	2589	2465
RT19M1	A	001	2B9C	3750	
RT19M5	A	001	2BC6	3766	
RT19M6	A	001	2BD7	3776	
RT19M7	A	001	2BF3	3786	
RT19ST	A	004	2B98	3749	
RT2A	A	001	2F40	4243	4152
RT2B	A	001	3049	4388	4245
RT2BM1	A	029	4F49	6906	6882
RT2BM2	A	046	4F77	6907	6886
RT2BM3	A	043	4FA2	6908	6890
RT2C	A	001	30C1	4446	4390
RT2CAT	A	001	5229	7130	7030* 7036 7108 7113*
RT2D	A	001	3130	4493	4448
RT2DOP	A	049	2DBA	4006	3741
RT2E	A	001	3199	4545	4495
RT2EGO	A	004	4FAF	6928	
RT2END	A	004	0B1B	0161	0170
RT2F	A	001	3244	4643	4547
RT2FLG	A	001	0B5B	0177	0158* 0168 0169* 0173*
RT2LCS	A	003	0B34	0167	0164
RT2LD	A	004	0B46	0172	0174
RT2LIO	A	004	0B1F	0162	0161* 0163 0165* 0166
RT2ST	A	016	0B6B	0179	0157
RT2O	A	001	2688	3203	3136
RT2OOP	A	024	30BA	4427	4398
RT21	A	001	2772	3293	3205
RT21OP	A	025	312F	4481	4453
RT22	A	001	2946	3470	3295
RT22OP	A	025	3196	4526	4503
RT23	A	001	2A49	3585	3472
RT23OP	A	019	31D3	4570	4555
RT24	A	001	2B80	3734	3587
RT24OP	A	023	3282	4668	4653
RT25	A	001	2DC7	4018	3736
RT25OP	A	033	3350	4778	4752
RT26	A	001	2DE4	4039	4020
RT26OP	A	029	3438	4905	4890
RT27	A	001	2E5F	4101	4041
RT28	A	001	2E7C	4128	4103
RT29	A	001	2E99	4150	4130
RT29OP	A	018	34DD	5004	4985
RT3A	A	001	39B3	5624	5458
RT3AP2	A	003	21E0	2657	2606
RT3B	A	001	3AA9	5756	5626
RT3C	A	001	4000	5964	5758

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RT3CST	A	037	1020	0597	0431
RT3D	A	001	453B	6273	5966
RT3E	A	001	4549	6279	6275
RT3F	A	001	4557	6295	6281
RT3FGO	A	004	4595	6304	6302
RT3FNA	A	046	4594	6303	6301
RT3ST	A	037	0D87	0367	0202
RT30	A	001	32EB	4742	4645
RT30GO	A	004	24B8	2953	2951
RT31	A	001	33F5	4880	4744
RT31GO	A	004	252F	3005	3003
RT32	A	001	3498	4975	4882
RT32GO	A	004	25BC	3066	3064
RT33	A	001	355A	5080	4977
RT33GO	A	004	2661	3144	3142
RT34	A	001	3568	5086	5082
RT34GO	A	004	2079	2473	2471
RT35	A	001	3576	5092	5088
RT35GO	A	004	35D6	5129	5127
RT36	A	001	35A4	5119	5094
RT36GO	A	004	364F	5187	5185
RT37	A	001	3612	5177	5121
RT37GO	A	004	371A	5299	5297
RT38	A	001	36DF	5289	5179
RT38GO	A	004	386F	5467	5464
RT39	A	001	3843	5456	5291
RT4ST	A	025	1284	0784	0735
RT40	A	001	4AC5	6611	6297
RT400	A	002	5079	6992	6975
RT41	A	001	4EF2	6875	6613
RT41GO	A	006	2326	2832	2830
RT42	A	001	4FA3	6920	6877
RT43	A	001	5092	7004	6922
RT5ST	A	023	5917	7499	0809
RT6ST	A	035	18A8	1337	1223
RY1	A	002	5C54	7876	7871*
RY11	A	002	10F1	0681	0676*
RY2	A	002	5C52	7875	7872*
RY21	A	002	10EF	0680	0677*
ROAB01	A	004	1B3D	1645	1639
ROAB02	A	004	1B51	1653	1647
ROAEX1	A	002	1B3C	1643	1638
ROAEX2	A	002	1B50	1651	1646
ROAK01	A	004	1B0B	1622	1613 1614
ROAMCE	A	002	1B64	1665	1626
ROAMCS	A	001	1B58	1660	1625
ROBB01	A	004	1BAC	1711	1705
ROBB02	A	004	1BC0	1719	1713
ROBEX1	A	002	1BAB	1709	1704
ROBEX2	A	002	1B8F	1717	1712
ROBK01	A	004	1B7A	1688	1679 1680
ROBMCE	A	002	1BD3	1731	1692
ROBMCS	A	001	1BCA	1726	1691
ROCK01	A	004	1BE9	1754	1745 1746
ROCMCE	A	002	1C32	1795	1758
ROCMCS	A	001	1C03	1771	1757
RODK01	A	004	1C48	1817	1809 1810
RODMCE	A	002	1C99	1859	1821
RODMCS	A	001	1C62	1831	1820
ROEK01	A	004	1D4D	1993	1984 1985
ROEMCE	A	002	1D88	2027	1997
ROEMCS	A	001	1D67	2010	1996
ROFK01	A	004	1CFE	1937	1928 1929
ROFMCE	A	002	1D37	1970	1941
ROFMCS	A	001	1D18	1954	1940
RO1A8	A	004	0A64	0081	0078

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RO1PRT	A	004	0A6B	0083	0077 0079 0080 0081 0082
RO2HDR	A	016	0AAC	0102	0100
RO3DT1	A	002	0CDE	0311	0275* 0277* 0279* 0281* 0283* 0286* 0289 0292* 0301* 0304 0317* 0329 0331 0333 0335 0337
RO3END	A	003	0D88	0368	0350
RO3EPA	A	004	0DA7	0382	0237 0239
RO3ERR	A	004	0DBF	0394	0303 0306
RO3E09	A	004	0D83	0388	0321
RO3K03	A	004	0BAB	0222	0216 0386
RO3K04	A	004	0BC6	0230	0233
RO3K05	A	003	0BF5	0242	0222 0223
RO3K06	A	004	0BE9	0238	0236
RO3K15	A	003	0C98	0288	0276 0278 0280 0282 0284
RO3K16	A	003	0C9B	0289	0288* 0293* 0294 0295
RO3K17	A	004	0CC3	0302	0298* 0300 0313* 0318 0319
RO3K18	A	004	0CDF	0313	0305
RO3K19	A	004	0D10	0329	0323 0392
RO3K20	A	004	0D47	0348	0341
RO3K21	A	004	0CA8	0293	0291
RO3K22	A	003	0CF1	0318	0316
RO3NOE	A	003	0B8F	0228	0225
RO3ONE	A	001	0D54	0357	0293 0313
RO3PRT	A	004	0CD7	0308	0396 0402
RO3ST	A	004	0B78	0204	6946
RO4CNT	A	002	1269	0781	0741 0741* 0772* 0773
RO4END	A	002	126B	0782	0773
RO4ERR	A	004	1244	0766	0754 0763
RO4EXP	A	002	124B	0769	0740* 0746 0751 0771*
RO4K01	A	003	11E7	0740	0737 0738
RO4K02	A	005	124C	0771	0747
RO4K03	A	004	11F8	0745	0777
RO4K07	A	004	1264	0779	0774
RO4RTR	A	004	1220	0757	0752
RO4ZZ	A	004	1240	0764	0761
RO5ART	A	004	1446	0930	0898 0903 0907 0927
RO5A00	A	004	13E4	0905	0900
RO5DAE	A	002	5677	7468	7452
RO5DAS	A	002	5675	7467	7415
RO5DCS	A	004	5567	7386	0945 0953 0961 0969 0977 0985 0993 1001 1011 1019 1027 1035 1043 1068 1092 1117 7095
RO5DFL	A	001	566E	7462	7392* 7397 7400 7403 7406 7409 7412
RO5DK1	A	004	55B8	7406	7398 7401 7404
RO5DK2	A	006	55F0	7421	7453
RO5DK9	A	006	55E2	7415	7407 7410 7413
RO5DPS	A	002	566D	7461	7389*
RO5DRB	A	004	5668	7460	7386* 7391 7394*
RO5DUP	A	002	5620	7437	7415* 7440* 7451* 74[illegible]
RO5DWK	A	002	5700	7491	7426* 7427 7427* 74[illegible]
RO5DW1	A	002	5679	7469	7396* 7399* 7402* 74[illegible] 7408* 7411* 7414* 7424 7426 7450*
RO5DX1	A	004	5660	7458	7387*
RO5DX2	A	004	5664	7459	7388*
RO5FS1	A	003	134A	0863	0853*
RO5FS2	A	003	138F	0879	0854*
RO5HC	A	001	144B	0932	0855*
RO5HDG	A	010	56FE	7490	7419
RO5INC	A	002	16C2	1140	0864* 0865* 0870 0872*
RO5JC1	A	004	168D	1119	1004 1034 1037 1116
RO5K0A	A	004	15B1	1046	1042
RO5K0B	A	004	158A	1050	1064
RO5K0C	A	006	15D8	1060	1056
RO5K0D	A	004	15FB	1071	1067
RO5K0E	A	004	1604	1075	1088
RO5K0F	A	006	1621	1084	1081
RO5K01	A	004	133A	0857	1130 1135
RO5K02	A	004	1355	0866	0877
RO5K07	A	004	1392	0880	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
R05K08	A	004	13A3	0886	0939 0944 0947 0952 0955 0960 0963 0968 0971 0976 0979 0984 0987 0992 0995 1005 1010 1013 1018 1021 1026 1029 1039
R05K09	A	006	144E	0935	0892
R05K10	A	004	1644	1096	1091
R05K11	A	004	164D	1100	1113
R05K12	A	006	166A	1109	1106
R05K14	A	004	169D	1127	1119
R05K15	A	004	16AC	1132	1128
R05K18	A	003	16C3	1142	1125 1133
R05K96	A	003	138C	0878	
R05LPR	A	004	1691	1121	0867 0868
R05ONE	A	001	56E8	7482	1198
R05PAD	A	002	56EE	7486	7433
R05PAS	A	002	56EC	7485	7442
R05POX	A	006	5683	7471	7431
R05PX	A	002	5622	7438	7433* 7441* 7442
R05P01	A	004	567D	7470	7425 7485
R05P02	A	001	56D6	7472	7421* 7438 7448 7486
R05P03	A	001	56D7	7473	7421
R05RST	A	004	1336	0856	
R05SEX	A	006	13BC	0893	0890 1054 1057 1079 1082 1104 1107
R05SF1	A	001	566F	7463	0811* 0856* 0897 1127 1129* 1132 1134* 1184 1190 1196 8088 8091
R05SIN	A	002	5671	7464	0873 0935 1060 1084 1109 1187* 1193* 1198*
R05SK1	A	004	1700	1190	1185
R05SK5	A	004	1717	1196	1191
R05SPC	A	004	16CA	1175	0859 0883 1047 1072 1097
R05SPS	A	002	1738	1204	1178* 1200 7457
R05SRB	A	004	1736	1203	1175* 1180 1182*
R05SRR	A	004	172A	1200	1188 1194 1197
R05SSC	A	002	1698	1124	0866 0873* 0891 0893 0935* 1055 1060* 1080 1084* 1105 1109* 1186* 1192* 1199*
R05ST	A	004	132A	0853	
R05SX1	A	004	172E	1201	1176*
R05SX2	A	004	1732	1202	1177*
R05UNP	A	004	561A	7435	7443
R05W01	A	002	5673	7465	0840 0840* 0858* 0875* 0876 0881* 0905* 0906 0937* 0938 0941 0949 0957 0965 0973 0981 0989 0997 1007 1015 1023 1031 1038 1062* 1063 1086* 1087 1111* 1112 7031 7031* 7040* 7041 7045 7048 7051 7055 7058 7061 7064 7067 7070 7073 7076 7079 7082 7085 7088 7098 7100 7104 7106 7116 8039
R05W18	A	001	5701	7492	0882 0940 1046 1071 1096 7032 7467
R05W1E	A	256	5900	7493	7468
R05X01	A	002	144D	0933	0893*
R05ZER	A	002	56E7	7481	1179 1186 1187 1193 1199 7390 7396
R05ZZZ	A	004	1442	0929	0909 0911 0913 0915 0917 0919 0921 0923 0925
R05010	A	001	56EA	7484	7450
R05100	A	001	56E9	7483	7399 7402 7405
R06ACP	A	004	187D	1331	1253
R06BME	A	002	1870	1322	1230* 1233* 1236* 1240* 1244
R06BMM	A	002	186E	1321	1231* 1234* 1237* 1241* 1243 1244 1247* 1248
R06E01	A	001	1871	1324	1256
R06K01	A	004	179D	1243	1236 1249
R06K02	A	006	17AE	1247	1245
R06K03	A	004	17CE	1256	1259
R06K05	A	004	17F9	1270	1264
R06KC6	A	006	17C8	1255	1335
R06K07	A	003	17E1	1261	1329
R06K08	A	006	181D	1283	1277
R06MC1	A	001	1867	1317	1272
R06MC2	A	002	186A	1319	
R06MC4	A	002	186C	1320	1273
R06NR	A	004	1871	1325	
R06ONE	A	001	184E	1303	1247 1257 1258
R06PRT	A	004	17F1	1265	
R06W01	A	002	1850	1304	1255* 1258*
R06XB1	A	002	1860	1312	1229

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
R06XB2	A	002	1862	1313	1232
R06XB3	A	002	1864	1314	1235
R06XB4	A	002	1866	1315	1239
R06XD1	A	002	17F8	1268	1229* 1232* 1235* 1239* 1263
R06ZER	A	002	184D	1302	1225 1226 1257
R07K01	A	004	1951	1365	1356 1357
R07K03	A	001	197A	1382	
R07MCE	A	002	19A9	1406	1369
R07MCS	A	001	19A0	1401	1368
R07T01	A	004	1982	1388	1381
R07T02	A	004	1996	1397	1390
R08END	A	006	182A	1288	1282
R08K01	A	004	19BF	1432	1423 1424
R08MCE	A	002	1A6A	1522	1436
R08MCS	A	001	19E1	1453	1435
R09B01	A	004	1AB6	1569	1563
R09B02	A	004	1ACA	1577	1571
R09B03	A	004	1ADE	1585	1579
R09EX1	A	002	1A85	1567	1562
R09EX2	A	002	1AC9	1575	1570
R09EX3	A	002	1ADD	1583	1578
R09K01	A	004	1A80	1545	1536 1537
R09MCE	A	002	1AF5	1599	1549
R09MCS	A	001	1AE8	1592	1548
R1BK01	A	004	2DF4	4051	4043 4044
R1BMCE	A	002	2E5E	4095	4055
R1BMCS	A	001	2E48	4085	4054
R1CIC	A	002	3990	5591	5537*
R1CM1	A	022	39A6	5592	5541 8481
R1EK01	A	004	2EA9	4162	4154 4155
R1EMCE	A	002	2F3F	4228	4166
R1EMCS	A	001	2EE6	4183	4165
R1FB01	A	004	2F8A	4274	4271
R1FEX1	A	002	2F7D	4269	4270
R1FK01	A	004	2F62	4258	4247 4248
R1FMCE	A	002	3028	4354	4255* 4256* 4257* 4262 4406* 4407* 4408* 4413 4458* 4459* 4460* 4465 4505* 4506* 4507* 4512 5976* 5977* 5978* 5982 5990* 5991* 5992* 5996* 5997* 5998* 6002* 6003* 6004* 6013* 6014* 6015* 6019* 6020* 6021* 6025* 6026* 6027* 6036* 6037* 6038* 6042* 6043* 6044* 6048* 6049* 6050* 6059* 6060* 6061* 6065* 6066* 6067* 6071* 6072* 6073* 6082* 6083* 6084* 6088* 6089* 6090* 6094* 6095* 6096* 6105* 6106* 6107* 6111* 6112* 6113* 6117* 6118* 6119* 6128* 6129* 6130* 6134* 6135* 6136* 6140* 6141* 6142* 6151* 6152* 6153* 6157* 6158* 6159* 6163* 6164* 6165* 6174* 6175* 6176* 6180* 6181* 6182* 6186* 6187* 6188* 6197* 6198* 6199* 6203* 6204* 6205* 6209* 6210* 6211* 6226
R1FMCS	A	001	2FA7	4288	4261 4412 4464 4511 5981 6225
R1OK01	A	004	1CAF	1881	1872 1873
R1OMCE	A	002	1CE8	1914	1885
R1OMCS	A	001	1CC9	1898	1884
R11HDR	A	039	1DEE	2089	2064
R11K01	A	004	1D99	2066	2058 2059
R11MCE	A	002	1E32	2128	2069
R11MCS	A	001	1DEF	2094	2068
R11MC2	A	001	1E33	2129	2072
R11MC3	A	002	1E52	2145	2073
R11MC4	A	001	1E53	2146	2076
R11MC5	A	002	1E72	2162	2077
R11MC6	A	001	1E73	2163	2080
R11MC7	A	002	1E92	2179	2081
R12K01	A	004	1EA8	2203	2194 2195
R12MCE	A	002	1F02	2251	2206
R12MCS	A	001	1EC8	2223	2205
R12MC2	A	001	1F03	2253	2209
R12MC3	A	002	1F26	2271	2210
R13K01	A	004	1F3C	2297	2288 2289
R13MCE	A	002	1FA3	2353	2301

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
R13MCS	A	001	1F56	2314	2300
R14K01	A	004	1FB9	2377	2368 2369
R14MCE	A	002	1FE4	2403	2381
R14MCS	A	001	1FD3	2394	2380
R15K01	A	004	1FF5	2427	2419 2420
R15MCE	A	002	2041	2458	2431
R15MCS	A	001	2026	2444	2430
R16B02	A	006	26F9	3236	3230
R16B03	A	005	2718	3245	3237
R16B04	A	004	2720	3247	3239
R16B05	A	004	2727	3249	3241
R16B06	A	004	272E	3252	3243
R16EX2	A	002	26F8	3234	3221* 3222 3229 3236 3238 3240 3242 3245* 3247* 3249*
R16K01	A	004	26C8	3215	3207 3208
R16MCE	A	002	2771	3280	3219
R16MCS	A	001	274E	3262	3218
R16RPT	A	003	26D7	3222	3246 3248 3250
R16RTN	A	004	26F1	3231	
R17B02	A	006	27E7	3339	3297 3298 3334
R17B03	A	004	27F1	3341	3337
R17EX1	A	002	27AF	3322	3324
R17HC	A	002	283A	3367	3365*
R17HLT	A	004	2826	3361	3327
R17K01	A	004	2782	3305	
R17L1	A	002	2840	3370	3329* 3343
R17L2	A	002	2842	3371	3330* 3333
R17L3	A	002	2844	3372	3331* 3347 3351
R17MCE	A	002	2945	3453	3309
R17MCS	A	001	28C8	3386	3308
R17M1	A	030	288B	3376	3335* 3339*
R17M2	A	013	2898	3377	3344 3354
R17M3	A	020	28AC	3378	3348 3355
R17M4	A	017	28BD	3379	3352 3356 3360
R17M5	A	005	28C2	3380	3339
R17M6	A	005	28C7	3381	3335
R17P	A	002	2846	3373	3311* 3314* 3316
R17PO	A	004	27BA	3326	3770 3789 3818 3842 3876 3903
R17PP	A	003	279B	3315	3313
R17RPT	A	003	279E	3316	
R18CHK	A	011	63C1	8380	8338 8343 8349 8354 8359
R18CS	A	025	6054	8386	8347 8353
R18CSA	A	025	6059	8387	8342
R18EXP	A	010	63A3	8377	8302
R18HDB	A	007	63C8	8381	8337
R18NON	A	004	63D7	8383	8363 8364
R18OPD	A	009	63B6	8379	8358
R18REC	A	010	63AD	8378	8310
R18WK	A	002	63FD	8388	7213 7214 8287 8288 8316 8317
R18WRD	A	011	63D3	8382	8348
R2AEXT	A	001	4D2B	6831	6615 6788
R2AMA	A	002	54EE	7303	7220
R2AWK	A	002	4D3D	6838	
R2BEXD	A	002	3FBF	5953	6893
R2BEX1	A	002	4F27	6901	6893*
R2BGO	A	004	4EFE	6883	
R2BMCE	A	004	3FFF	5958	6897
R2BMCS	A	001	3FC0	5954	6896
R2CATT	A	004	5203	7113	7038
R2CENA	A	003	50DE	7029	
R2CINC	A	003	5103	7039	7037 7122
R2CK01	A	004	50EF	7034	7042
R2CK02	A	004	51CF	7098	7094
R2CMG1	A	035	524C	7132	7117
R2CMG2	A	013	5259	7133	7121 7127
R2CPRT	A	004	521D	7124	7109
R2CPX	A	001	51CE	7096	7044* 7047* 7050* 7053* 7057* 7060* 7063* 7066* 7069* 7072* 7075* 7078*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
					7081* 7084* 7087* 7090* 7091
R2CP13	A	006	51BD	7091	7046 7049 7052 7056 7059 7062 7065 7068 7071 7074 7077 7080
					7083 7086 7089
R2CRST	A	004	50E6	7032	7099 7101 7105 7107
R2CST	A	004	50D3	7026	7017
R2CTER	A	004	51FE	7110	7128
R2CTSX	A	004	51C3	7093	7091*
R2DEX1	A	002	28C8	3767	3769 3817 3875
R2DEX2	A	002	28F5	3787	3788 3841 3902
R2DMCA	A	002	2D87	4001	3853
R2DMCB	A	001	2D88	4003	3882
R2DMCC	A	002	2D89	4004	3883
R2DMCE	A	002	2D05	3906	3752
R2DMCS	A	001	2D04	3905	3751
R2DMC1	A	001	2D06	3916	3757 3805 3862
R2DMC2	A	002	2D43	3950	3758 3806 3863
R2DMC3	A	001	2D44	3957	3777 3828 3889
R2DMC4	A	002	2D81	3991	3778 3829 3890
R2DMC5	A	001	2D82	3993	3796 3800
R2DMC6	A	002	2D83	3994	3797 3801
R2DMC7	A	001	2D84	3997	3824
R2DMC8	A	002	2D85	3998	3825
R2DMC9	A	001	2D86	4000	3852
R2EMSG	A	024	5091	6993	6927
R2FADL	A	004	509E	7012	
R2FMSG	A	029	50D2	7018	7011
R2OB01	A	004	309F	4425	4422
R2OEX1	A	002	3092	4420	4421
R2OK01	A	004	3077	4409	4392 4393
R2OMCE	A	002	30C0	4434	4403
R2OMCS	A	001	30B8	4431	4402
R21B01	A	004	3108	4477	4474
R21EX1	A	002	30FE	4472	4473
R21K01	A	004	30E3	4461	4455 4456
R21ST	A	004	30CD	4456	6949
R22B01	A	004	317A	4524	4521
R22EX1	A	002	316D	4519	4520
R22K01	A	004	3152	4508	4497 4498
R23K01	A	004	31A9	4557	4549 4550
R23MCE	A	002	3243	4628	4561
R23MCS	A	001	31D4	4572	4560
R24K01	A	004	3254	4655	4647 4648
R24MCE	A	002	32EA	4726	4659
R24MCS	A	001	3283	4673	4658
R25B01	A	004	332C	4776	4769
R25ERR	A	004	3324	4771	
R25EX1	A	002	3328	4774	4767* 4768
R25HDR	A	013	2DE3	4026	4024
R25K01	A	004	32FB	4754	4746 4747
R25MCE	A	002	33F4	4865	4758
R25MCS	A	001	3351	4783	4757
R26K01	A	004	3405	4892	4884 4885
R26MCE	A	002	3497	4956	4896
R26MCS	A	001	343C	4910	4895
R27HDR	A	013	2E7B	4109	4107
R28HDR	A	013	2E98	4137	4135
R29K01	A	004	34A8	4987	4979 4980 4995 4995
R29MCE	A	002	3559	5075	4991
R29MCS	A	001	34DE	5009	4990
R3AA55	A	004	0C7B	0279	0332
R3ACPT	A	006	0DE1	0401	0399
R3AGO	A	004	2176	2599	2597
R3AHDR	A	020	2175	2598	2596
R3AMCE	A	002	21DF	2654	2602
R3AMCS	A	001	218A	2611	2601
R3AMC1	A	001	2202	2673	2663

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
R3AMC2	A	002	2227	2692	2664
R3BB01	A	004	3837	5807	5800
R3BB02	A	003	3B4B	5815	5808
R3BB03	A	005	3B57	5819	5816
R3BB05	A	003	3B69	5827	5818
R3BB06	A	004	3B96	5846	5832
R3BEX1	A	002	3B36	5805	5799
R3BEX2	A	002	3B4A	5813	5807
R3BG01	A	004	3ADF	5769	5760 5761 5767
R3BHDR	A	034	3ADE	5768	5766
R3BMCE	A	002	3C5A	5947	5772
R3BMCS	A	001	38BF	5868	5771
R3BMC2	A	004	381C	5795	5784
R3CACP	A	006	107A	0631	0629
R3CA55	A	004	0F11	0508	0561
R3CDT1	A	002	0F74	0540	0504* 0506* 0508* 0510* 0512* 0515* 0518 0521* 0530* 0533 0546* 0558 0560 0562 0564 0566
R3CE	A	006	0ED1	0488	0479 0483
R3CEND	A	003	1021	0598	0579
R3CEPA	A	004	1040	0612	0466 0468
R3CERR	A	004	1058	0624	0532 0535
R3CE09	A	004	104C	0618	0550
R3CFFF	A	004	0F0A	0506	0559
R3CHL	A	001	0EF6	0498	0476* 0480* 0486* 0488
R3CHL1	A	001	0EE8	0493	0488*
R3CINC	A	004	0F26	0514	0567
R3CISA	A	003	0EFD	0502	
R3CK03	A	004	0E41	0451	0445 0616
R3CK04	A	004	0E5C	0459	0462
R3CK05	A	003	0E8B	0471	0451 0452
R3CK06	A	004	0E7F	0467	0465
R3CK15	A	003	0F2E	0517	0505 0507 0509 0511 0513
R3CK16	A	003	0F31	0518	0517* 0522* 0523 0524
R3CK17	A	004	0F59	0531	0527* 0529 0542* 0547 0548
R3CK18	A	004	0F75	0542	0534
R3CK19	A	004	0FA6	0558	0552 0622
R3CK20	A	004	0FDD	0577	0570
R3CK21	A	004	0F3E	0522	0520
R3CK22	A	003	0F87	0547	0545
R3CNOE	A	003	0E55	0457	0454
R3CONE	A	001	0FE8	0585	0522 0542
R3CPRT	A	004	0F6D	0537	0626 0632
R3CST	A	004	0E0E	0433	0349
R3CTTL	A	028	402B	5972	5970
R3C000	A	004	0F03	0504	0441 0442 0574
R3C202	A	004	0F1F	0512	0565
R3C5AA	A	004	0F18	0510	0563
R3DISA	A	003	0C67	0273	
R3E	A	006	0C3B	0259	0250 0254
R3EPC1	A	004	0EE3	0491	
R3EPO	A	004	0C4D	0262	
R3FFFF	A	004	0C74	0277	0330
R3FMCE	A	002	4AC0	6598	6542
R3FMCS	A	001	4A97	6577	6311* 6312* 6315* 6318* 6325* 6328* 6331* 6338* 6339* 6342* 6345* 6352* 6355* 6358* 6365* 6366* 6369* 6372* 6379* 6382* 6385* 6392* 6393* 6396* 6399* 6406* 6409* 6412* 6419* 6420* 6423* 6426* 6433* 6436* 6439* 6541
R3FM01	A	042	48CC	6514	6446
R3FM02	A	017	48DD	6515	6458 6462 6488 6492
R3FM03	A	019	4935	6518	6479
R3FM04	A	021	495A	6521	6501
R3FM05	A	029	4987	6522	6505
R3FM06	A	004	49BB	6523	6469
R3HLT	A	001	0C60	0269	0247* 0251* 0257* 0259
R3HLT1	A	001	0C52	0264	0259*
R3INC	A	004	0C90	0285	0338
R3RST	A	004	0C63	0271	0256

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
R3RST1	A	004	0EF9	0500	0485
R3OHDR	A	030	248A	2952	2950
R3OMCE	A	002	24FE	2990	2957
R3OMCS	A	001	24CF	2966	2956
R30000	A	004	0C6D	0275	0212 0213 0345
R30202	A	004	0C89	0283	0336
R31HDR	A	032	252E	3004	3002
R31MCE	A	002	2582	3050	3009
R31MCS	A	001	2543	3018	3008
R32HDR	A	041	258B	3065	3063
R32MCE	A	002	2633	3128	3070
R32MCS	A	001	25D0	3075	3069
R33HDR	A	029	2660	3143	3141
R33MCE	A	002	2699	3173	3147
R33MCS	A	001	267E	3159	3146
R33MC1	A	001	269A	3175	3150
R33MC2	A	002	26B7	3190	3151
R34HDR	A	039	2078	2472	2470
R34MCE	A	002	20E5	2527	2476
R34MCS	A	001	20A8	2496	2475
R34MC1	A	001	20E6	2528	2479
R34MC2	A	002	20EF	2533	2480
R34MC3	A	001	20F0	2534	2483
R34MC4	A	002	211B	2556	2484
R34MC5	A	001	211C	2557	2487
R34MC6	A	002	2151	2584	2488
R35HDR	A	034	35D5	5128	5126
R35MCE	A	002	3611	5160	5132
R35MCS	A	001	3604	5151	5131
R355AA	A	004	0C82	0281	0334
R36HDR	A	045	364E	5186	5184
R36MCE	A	002	36DE	5253	5190
R36MCS	A	001	36A7	5225	5189
R37E47	A	004	37F1	5382	5363
R37HDR	A	043	3719	5298	5296
R37H48	A	004	37F9	5386	5348
R37MCE	A	002	3842	5427	5302
R37MCS	A	001	3801	5394	5301
R37MC2	A	004	374B	5321	5310
R37NS1	A	003	377C	5341	5331
R38E40	A	004	3932	5542	5514
R38E41	A	004	393A	5547	5480
R38E42	A	004	391C	5532	5493
R38E43	A	006	3924	5537	5498
R38E48	A	004	3942	5552	5528
R38HDR	A	028	386E	5465	5463
R38INT	A	004	38A3	5487	5481
R38IOE	A	004	38AF	5493	5487
R38MCE	A	002	39B2	5602	5470
R38MCS	A	001	39A7	5596	5469
R39E3A	A	004	3A83	5693	5649
R39E3D	A	004	3A8B	5698	5689
R39GO	A	003	39E6	5634	5632
R39HDR	A	035	39E5	5633	5631
R39MCE	A	002	3AA8	5718	5638
R39MCS	A	001	3A93	5707	5637
R39S1	A	003	3A01	5645	5640
R39S2	A	003	3A23	5657	5651
R39S3	A	004	3A58	5677	5671
R39S3A	A	004	3A68	5683	5677
R39S4	A	004	3A4C	5671	5669 5670
R39T1	A	004	3A10	5649	5647 5648
R4CGO	A	004	4B08	6622	6620
R4CHDR	A	043	4B07	6621	6619
R4OC1	A	002	5073	6989	6955
R4OC3	A	002	5075	6990	6957

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
R4ODT	A	002	5071	6988	6934* 6937* 6968* 6971 6972* 6973 6977* 6978 6979* 6980
R4OE	A	001	506D	6986	6973 6980
R4OGO	A	004	2253	2714	2712
R4OHDR	A	027	2252	2713	2711
R4OHO	A	002	4F8C	6932	
R4OLD	A	004	5020	6966	6929 6953
R4OLDR	A	004	5069	6984	6966*
R4OL2	A	004	5030	6971	6974
R4OL3	A	004	504E	6978	6981
R4OMCE	A	002	228A	2741	2717
R4OMCS	A	001	227D	2734	2716
R4OMC1	A	001	2286	2742	2721
R4OMC2	A	002	2296	2748	2722
R4OMC3	A	001	22C3	2774	2752
R4OMC4	A	002	22D2	2782	2753
R4OMC5	A	001	22D3	2784	2757
R4OMC6	A	002	22E2	2792	2758
R4OMC7	A	001	22E3	2794	2762
R4OMC8	A	002	22F0	2801	2763
R4OPT2	A	004	2297	2750	2730
R4OR1	A	004	4FEA	6947	0578
R4OR2	A	004	4FF4	6950	4478
R4OSLD	A	006	5024	6968	
R4OST	A	002	506F	6987	6956 6968 6977
R4OSY	A	003	4FFE	6954	6962
R4OTOL	A	006	4FC4	6936	6938
R41ACL	A	002	2488	2935	2861* 2869
R41CTR	A	002	248A	2936	2832* 2836* 2837
R41EM1	A	028	2443	2930	2865 2866
R41EM2	A	029	2460	2931	2874
R41EM3	A	018	2472	2932	2870 2878 2883
R41EM4	A	018	2484	2933	2866* 2882 2884
R41EXL	A	002	2486	2934	2859* 2864
R41EX1	A	002	237E	2855	2856
R41FET	A	004	2360	2847	
R41FLG	A	002	2427	2929	2845* 2846* 2849* 2850
R41FRS	A	002	2425	2928	2844
R41HDR	A	037	2325	2831	2829
R41LCS	A	004	2332	2835	2838
R41LDF	A	004	236C	2850	2848
R41MCE	A	002	2423	2925	2842
R41MCS	A	001	23E6	2894	2841
R42HDR	A	024	296D	3479	3477
R42MCE	A	002	2A42	3565	3483
R42MCS	A	001	29FB	3529	3482
R42MC1	A	001	2A43	3570	3518
R42MC2	A	002	2A48	3573	3519
R42MI2	A	004	29E7	3516	
R5E14	A	004	131E	0847	
R5HLT	A	001	1323	0849	0828* 0832* 0837* 0839
R5HLT1	A	001	1315	0844	0839*
R5INCE	A	004	1688	1137	0871
R5PO	A	006	12FE	0839	0830 0834
R5RSF	A	004	1326	0851	0836
SAB6	A	004	0B11	0158	
SARR	A	004	5C75	7890	7838* 7844*
SARR1	A	004	1112	0695	0643* 0649*
SAVARR	A	004	5AC0	8535	7578* 7579 7583* 7586* 7595 7597*
SAVXR1	A	004	59F8	8536	7582*
SAVXR2	A	004	59FC	8537	7577*
SBYTE0	C	001	0208	8557	6622 7026* 7604
SBYTE2	C	001	020A	8558	0322 0551 0943 0951 0959 0967 0975 0983 0991 0999 1009 1017 1025 1033 1041 1066 1090 1115 3745* 7606 7645
SBYTE3	C	001	0208	8559	3743 7093
SBYTE5	C	001	020D	8560	0052 6535
SB12F	A	003	528E	7186	7183

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SETDA1	A	006	47E1	6454	6453*
SETDA2	A	006	4839	6484	6483*
SETPO	A	004	545F	7262	7174 7179
SET1	A	003	5474	7268	7265
SET12	A	003	54E3	7299	7296
SET13	A	003	54CF	7293	7289
SET2	A	003	5485	7286	7283
SET3	A	003	5498	7279	7276
SIOI	C	001	0058	8591	0059 0159 0160 0167 0171 0175 0210 0228 0234 0242 0273 0274 0344 0368 0439 0457 0463 0471 0502 0503 0573 0598 0646 0652 0742 0743 0815 0816 0818 0819 0821 0822 0824 0825 0862 0863 0878 0879 1142 1227 1228 1251 1252 1261 1371 1378 1438 1551 1560 1628 1636 1694 1702 2657 2659 2833 2834 2843 2860 3315 3328 3484 3491 3499 3596 3598 3599 3605 3607 3608 3614 3617 3623 3625 3633 3635 3645 3647 3652 3654 3660 3668 3671 3672 3674 3681 3683 3684 3686 3688 3689 3694 3696 3697 3762 3782 3810 3834 3868 3895 4168 4170 4404 4766 4994 4996 5136 5141 5194 5196 5200 5205 5210 5215 5306 5327 5344 5346 5352 5354 5359 5361 5364 5471 5472 5479 5499 5506 5515 5519 5521 5522 5529 5634 5639 5657 5662 5666 5686 5690 5779 5849 5856 6543 6544 6546 6633 6635 6780 6803 6935 6939 6943 6954 6958 6959 6961 6969 6970 6983 7028 7029 7165 7340 7346 7600 7601 7641 7642 7841 7847 7918 7923 7924 8323 8326
SIONI0	C	001	0048	8592	
SIONI1	C	001	0049	8593	
SKIP1K	A	003	5964	7598	7594
SNSIT	A	002	377B	5340	5349* 5350 5353* 5355 5360* 5362
SPAREX	A	004	3584	5098	5084 5090 5096 6277 6283
SPARMS	A	014	359D	5104	5101 5105
SPARUT	A	014	3596	5105	5083* 5089* 5095* 6276* 6282*
SSW1C	C	001	0008	8552	3743
SSW1F	C	001	0001	8553	
SSW10	C	001	0080	8544	0322 0551
SSW11	C	001	0040	8545	
SSW12	C	001	0020	8546	0943 0951 0959 0967 0975 0983 0991 0999 1009 1017 1025 1033 1041 1066 1090 1115
SSW13	C	001	0010	8547	
SSW14	C	001	0008	8548	
SSW15	C	001	0004	8549	
SSW16	C	001	0002	8550	
SSW17	C	001	0001	8551	3745 7606 7645
SSW2E	C	001	0002	8554	6535
SSW2F	C	001	0001	8555	0052
START	A	004	0A20	0051	
STATAC	A	002	5FE6	8168	0261* 0266* 0302* 0304 0369* 0370 0395 0395 0397* 0398 0398 0401* 0490* 0495* 0531* 0533 0599* 0600 0625 0625 0627* 0628 0628 0631* 0745* 0746 0760 0841* 0846* 0869* 0870 0886* 0887 0891 0899 0899 0908 0910 0912 0914 0916 0918 0920 0922 0924 1050* 1051 1055 1075* 1076 1080 1100* 1101 1105 1262* 1263 1288 1379* 1380 1388* 1389 1561* 1562 1569* 1570 1577* 1578 1637* 1638 1645* 1646 1703* 1704 1711* 1712 2856 3228* 3229 3324 3326 3618* 3669* 3673* 3682* 3769 3788 3817 3841 3875 3902 4270 4421 4473 4520 4765* 4768 5801* 5809* 5819* 5820* 6233 6636* 6645* 6646 6667* 6668 6706* 6724 7034* 7035 7120 7161 7169* 7176 7347* 7348 8034
STATAM	A	002	5F5E	8121	8055* 8097* 8228
STATA1	A	002	6184	8214	8055
STATA2	A	002	6186	8215	8097
STATBL	A	001	600A	8173	8077* 8085* 8107* 8113* 8181*
STATBO	A	015	613E	8195	5572 5583 8485
STATB1	A	015	614D	8196	5696 5701 8487
STATB2	A	019	6160	8197	5644 5655 5675 5681 8489
STATB3	A	022	6176	8198	5375 5380 5385 8491
STATB4	A	008	617E	8199	0114 8493
STATB5	A	018	6190	8200	5555 8495
STATB6	A	010	619A	8201	0126 8497 8498
STATEI	A	002	5FCD	3158	8074*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
STATEX	A	002	5FE4	8167	8009* 8029
STATE1	A	002	5550	7354	1288 7338* 7348
STATFL	A	001	5FE2	8166	8006* 8014 8075 8083 8094 8103 8105 8111 8116 8127 8179
STATHC	A	001	554E	7353	3365 7236 7337*
STATK1	A	003	5EA3	8072	8069
STATK2	A	003	5ED1	8083	8076
STATK3	A	003	5F20	8103	8084
STATK5	A	003	5F3C	8111	8106
STATK6	A	003	6061	8179	8112
STATK7	A	003	5F1A	8101	8000 8001 8095
STATL	A	001	5F5C	8120	8072* 8078* 8096* 8101* 8108* 8114* 8182*
STATMA	A	031	60E1	8190	5485 5491 5511 8477
STATMB	A	022	60F7	8191	5314 5335 5788 5836 8479
STATMC	A	025	6110	8192	8107
STATMD	A	011	611B	8193	8113
STATME	A	020	612F	8194	8181
STATM0	A	001	5FE9	8171	
STATM1	A	009	5FF1	8172	8020 8025 8077 8080
STATM2	A	025	6060	8178	8040 8085 8087 8386 8387
STATM3	A	022	6023	8175	8030 8043 8081 8098 8215
STATM4	A	020	6037	8176	8035 8042 8121 8214
STATM5	A	016	6047	8177	0086 0391 0621 1334 8205 8471
STATM6	A	017	6087	8186	0120 0132 0138 5535 5545 5550 8469
STATM7	A	027	60A2	8187	0071 0220 0449 8467
STATM8	A	017	60B3	8188	1328 8475
STATM9	A	015	60C2	8189	5319 5339 5370 5389 5793 5840 5845 8473
STATMH	A	004	61C0	8223	8117
STATPL	A	003	5F50	8116	8082 8100 8102 8104 8110 8180 8184
STATPO	A	004	5F57	8118	8224
STATPS	A	002	5FE8	8169	8003* 8161
STATP1	A	003	5D81	8002	
STATP2	A	002	5F60	8122	8007* 8044 8073* 8074
STATP3	A	004	5F61	8124	8233
STATRB	A	004	5FDE	8164	7998* 8005 8012*
STATRS	A	004	5FD2	8161	8015 8128
STATSP	A	004	5F65	8125	8208
STATSQ	A	004	5F6C	8127	8126
STATUS	A	004	5DA5	7998	0262 0267 0308 0373 0491 0496 0537 0603 0766 0842 0847 0930 1121 1137 1265 1383 1392 1564 1572 1580 1640 1648 1706 1714 3231 4771 5802 5810 5821 7351
STATX1	A	004	5FD6	8162	8002*
STATX2	A	004	5FDA	8163	7999*
STERR	A	004	6227	8269	8265
STG1K	A	001	5A4D	7687	7592* 7596* 7707 7733 7759
STG2	C	001	0001	7497	
STHD	A	004	5C08	7848	7842
STHD1	A	004	10A5	0653	0647
STPMC	A	003	5538	7346	7330* 7334* 7343
SXR1	A	004	5C6D	7888	7839* 7845*
SXR11	A	004	110A	0693	0644* 0650*
SXR2	A	004	5C71	7889	
SXR21	A	004	110E	0694	
TABCK1	A	004	4A04	6551	6550* 6553* 6554 6555
TABCK2	A	004	4A2C	6560	6559* 6562* 6563 6564
TABDO	A	006	4A1C	6556	6555*
TABDOA	A	006	4A44	6565	6564*
TABENT	A	006	4A16	6555	6552
TABLOP	A	002	5D63	7928	7917
TABNXT	A	006	4A3E	6564	6561
TB13	A	004	54BE	7288	7285
TB2	A	004	5444	7281	7278
TERLNK	A	004	6606	8524	6834
TERR0	A	004	634E	8356	8352
TERR1	A	004	6337	8351	8346
TERR2	A	004	631A	8345	8341
TERR3	A	004	6303	8340	8336

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
TEST	C	001	0212	8561	
TESTEQ	A	004	49D8	6539	6536
THREE	A	002	5566	7363	7356
TIO1	A	003	0A43	0066	0062 0064
TIO17	A	004	0AAD	0103	0101
TIO17E	A	004	0AC9	0111	0104
TIO18	A	004	0AB5	0105	0103
TIO18E	A	004	0AD5	0117	0105
TIO19	A	004	0AB9	0106	
TIO19E	A	004	0AE1	0123	0106
TIO20	A	004	0ABD	0107	
TIO20E	A	004	0AED	0129	0107
TIO21	A	004	0AC1	0108	
TIO21E	A	004	0AF9	0135	0108
TIO3	A	003	0A4E	0073	0066
TIO3ER	A	001	0A55	0076	0073
TNONE	A	004	6365	8361	8357
TPC1	A	006	4B8E	6674	6669
TP4	A	004	5EF2	8091	8089
TRTN21	A	004	649D	8448	8444
TRYTWO	A	002	1286	0785	0758* 0759* 0760
TSTBIT	A	004	5467	7264	7262* 7271 7271* 7273
TSTB0	A	003	5999	7615	7613
TSTB2	A	004	5949	7592	7585
TSTCHK	A	004	61E6	8255	3600 3609 3619 3629 3639 3648 3655 3661 3677 3690 3698 8290
TSTERR	A	006	6286	8297	
TSTRST	A	003	598F	7612	7605 7607
TSTSSW	A	004	5974	7604	7599
TWO	A	001	5A0E	7665	7621
TXR1	A	004	62UD	8327	8256* 8267*
UDTMSG	A	036	6676	8529	8457
UDTPO	A	004	6486	8454	8447 8451
UDT2	A	003	0A0C	0016	1003 1276 2728 2847 3312 3848 6011 6034 6057 6080 6103 6126 6149 6172 6195 6322 6335 6349 6362 6376 6389 6403 6416 6430 7102
UDT3	A	003	0A0F	0032	5646 5668
ULOG1	A	010	6613	8525	8445
ULOG2	A	010	661D	8526	8450
ULOG3	A	010	6627	8527	8452
UNPACK	C	001	021E	8565	0678 2862 2867 3341 3345 3349 6247 6455 6485 7114 7118 7204 7210 7215 7422 7428 7435 7873 8017 8022 8027 8032 8037 8284 8313 8397 8401
UNPHLT	A	002	65F7	8520	8400
UNPRTN	A	002	65F5	8519	8404
VOLTFL	A	001	61B1	8212	
VOLT5F	A	001	61B2	8213	
WORDNO	A	002	398E	5590	5537
WRAP	A	004	4426	6222	5995 6001 6007 6018 6024 6030 6041 6047 6053 6064 6070 6076 6087 6093 6099 6110 6116 6122 6133 6139 6145 6156 6162 6168 6179 6185 6191 6202 6208 6214
WRAPEH	A	001	4443	6231	5994* 6000* 6006* 6017* 6023* 6029* 6040* 6046* 6052* 6063* 6069* 6075* 6086* 6092* 6098* 6109* 6115* 6121* 6132* 6138* 6144* 6155* 6161* 6167* 6178* 6184* 6190* 6201* 6207* 6213*
WRAPEX	A	004	4480	6257	6222* 6234
WRPIN	A	002	3046	4376	4257 4408 4460 4507
WRPOUT	A	002	3048	4377	5978 5992 5998 6004 6015 6021 6027 6038 6044 6050 6061 6067 6073 6084 6090 6096 6107 6113 6119 6130 6136 6142 6153 6159 6165 6176 6182 6188 6199 6205 6211
WUN	A	001	5A0B	7663	0165 0173 0231 0260 0342 0460 0489 0771 0772 0872 2836 3653 6937 6972 6979 7040 7269 7280 7287 7344 7583 7590 7597 7620 7634
XAA55	A	002	0D56	0358	0279 0333 1373 2658 3615 3642 3643 4061 6634
XCA55	A	002	0FEE	0588	0508 0562
XCFFF	A	002	0FF2	0590	0506 0560
XC202	A	002	0FF4	0591	0512 0521 0543 0566
XC5AA	A	002	0FF0	0589	0510 0564

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
XD000	A	002	248C	2937	2835
XE003	A	002	2B65	3708	3695
XE101	A	002	2863	3707	3687
XFFFF	A	002	0D59	0360	0245 0277 0331 0474 0823 1192 1629 1695 2660 3492 3493 3494 3495 3496 3497 3498 3500 3501 3502 3503 3504 3505 3506 3507 3508 3509 3510 3511 3512 3513 3514 3515
XFLAG	A	001	61B7	8216	0207* 0248* 0252* 0258* 0271* 0436* 0477* 0481* 0487* 0500* 0748* 0812* 0829* 0833* 0838* 0851* 6046 8050 8129 8131 8223 8225*
XF001	A	002	1852	1305	1255
XRMT	A	021	53A6	7247	7191
XRM1	A	043	53D1	7248	7195
XRM2	A	043	53FC	7249	7173 7199
XRM3	A	043	5427	7250	7178 7203
XRM4	A	003	542A	7251	
XRM5	A	013	5437	7252	
XRM6	A	028	5453	7253	7207 7209 7234 7303
XR1	C	001	0001	8539	0062 0064* 0066 0073 0212 0213* 0275 0275 0277 0277 0279 0279 0281 0281 0283 0283 0286 0286 0288 0289 0290 0292 0292 0293 0293 0294 0295 0297 0297 0298 0299 0301 0301 0304 0313 0313 0314 0314 0315 0317 0317 0318 0319 0324 0326 0329 0329 0330 0331 0331 0332 0333 0333 0334 0335 0335 0336 0337 0337 0338 0340 0342 0343 0345 0441 0442* 0504 0504 0506 0506 0508 0508 0510 0510 0512 0512 0515 0515 0517 0518 0519 0521 0521 0522 0522 0523 0524 0526 0526 0527 0528 0530 0530 0533 0542 0542 0543 0543 0544 0546 0546 0547 0548 0553 0555 0558 0558 0559 0560 0560 0561 0562 0562 0563 0564 0564 0565 0566 0566 0567 0569 0571 0572 0574 0644 0645* 0650 0651* 0653 0673* 0676 0684 0686 0686* 0693* 0737 0738* 0740 0741 0741 0746 0771 0772 0773 0773 0777 0882* 0887 0888 0888* 0940* 1046* 1051 1052 1052* 1071* 1076 1077 1077* 1096* 1101 1102 1102* 1176 1180* 1181 1181* 1182 1201* 1225 1226* 1257 1356 1357* 1359 1372 1380 1389 1423 1424* 1426 1439 1536 1537* 1539 1562 1570 1578 1613 1614* 1616 1638 1646 1679 1680* 1682 1704 1712 1745 1746* 1748 1809 1810* 1812 1872 1873* 1875 1928 1929* 1931 1984 1985* 1987 2058 2059* 2194 2195* 2197 2288 2289* 2291 2368 2369* 2371 2419 2420* 3207 3208* 3222 3229 3238 3240 3240 3242 3242 3245 3246 3247 3247 3248 3249 3249 3250 3297 3298* 3316 3333 4043 4044* 4154 4155* 4247 4248* 4270 4392 4393* 4421 4455 4456* 4473 4497 4498* 4520 4549 4550* 4647 4648* 4746 4747* 4768 4884 4885* 4979 4980* 5760 5761* 5774 5774 5799 5799 5801 5807 5807 5809 5815 5817 5819 5820 7032* 7035 7039 7039* 7160 7173* 7178* 7182 7184 7186 7243* 7266 7268 7270* 7277 7279 7281* 7284 7286 7290 7293 7297 7299 7335 7336* 7337 7338 7359* 7387 7391* 7392 7393 7393* 7394 7458* 7582 7587* 7618 7619 7619* 7648* 7794 7795* 7797 7798 7799 7806 7808* 7809 7811 7811* 7813 7823* 7839 7840* 7845 7846* 7848 7868* 7871 7879 7881 7881* 7888* 7916 7917* 7919 7920 7921 7921* 7925* 8002 8005* 8006 8007 8008 8008* 8009 8010 8010* 8012 8162* 8256 8257* 8259 8260 8262 8264 8267 8327*
XR2	C	001	0002	8540	0674* 0677 0683 0683* 0694* 0857* 0858 0874 0874* 0875 0880* 0881 0905 0936 0936* 0937 1061 1061* 1062 1085 1085* 1086 1110 1110* 1111 1177 1202* 7170* 7175* 7300 7388 7459* 7576 7577 7579* 7580 7581* 7582 7583 7583 7584 7586 7586 7587 7588 7588 7590 7590 7593 7597 7597 7598 7602 7602 7608 7610 7612 7615 7620 7620 7621 7621 7622 7624 7624 7626 7627 7633 7634 7634 7635 7636 7637 7639 7643 7643 7647 7649* 7689 7689 7691 7692 7695 7695 7697 7698 7701 7701 7703 7704 7709 7709 7711 7715 7715 7717 7721 7721 7723 7727 7727 7729 7735 7735 7737 7741 7741 7743 7747 7747 7749 7753 7753 7755 7761 7761 7763 7767 7767 7769 7773 7773 7775 7779 7779 7781 7869* 7872 7878 7878* 7889* 7999 8000 8001* 8002 8003 8005 8006 8007 8055 8072 8073 8074 8074 8075 8078 8083 8094 8096 8097 8101 8103 8105 8108 8111 8114 8116 8163* 8179 8180 8182 8184
XXR1	A	004	5D5A	7925	7916*
XXXX	A	002	61BB	8219	8048 8049 8052 8053
X0BFF	A	002	56E5	7480	0876
X0C00	A	002	2DC0	4009	2837 3812 3835

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
X00FF	A	002	56DB	7475	1038 1696
X0000	A	002	2DBC	4007	0906 3763
X0001	A	002	56D9	7474	0397 0401 0627 0631 0759 6463 6493 6553 6562 8427
X0002	A	002	5BE6	7826	7440 8258
X0005	A	002	56F0	7487	7441
X0040	A	002	56F2	7488	7451
X0080	A	002	19E0	1449	1439
X01FF	A	002	56DD	7476	1063
X0155	A	002	3198	4527	3646 4514 4760 4898
X02AA	A	002	274D	3257	3240 3247 4467
X02FF	A	002	56DF	7477	1087
X0202	A	002	0D5B	0361	0283 0292 0314 0337 3658
X03FF	A	002	56E1	7478	1112 4264
X0343	A	002	453A	6266	5983 6227
X0400	A	002	56F4	7489	3764 3783 7408 7411 7414
X0555	A	002	274B	3256	3242 3249
X0584	A	002	2B67	3709	3670
X07FF	A	002	56E3	7479	3221 3236
X0800	A	002	2DBE	4008	3784 3811
X1C	A	002	54EC	7302	7229 7230
X1000	A	002	2DC2	4010	3836 3869
X1011	A	002	0D5D	0362	0205 0370 0372
X1400	A	002	2DC4	4011	3870 3896
X1415	A	002	5D6D	7933	3606
X1800	A	002	2DC6	4012	3897
X2021	A	002	0FEA	0586	0571
X2200	A	002	5D83	7944	
X2204	A	002	2B5F	3705	3624
X2205	A	002	5D8D	7949	3597 5520
X2503	A	002	2B61	3706	3634
X3031	A	002	0FF8	0595	0434 0600 0602
X5A00	A	002	5A21	7675	7741
X5B00	A	002	5A23	7676	7747
X5C00	A	002	5A25	7677	7753
X5D00	A	002	5A27	7678	7761
X5E00	A	002	5A29	7679	7767
X5F00	A	002	5A2B	7680	7773
X50FF	A	002	1856	1307	1231
X5000	A	002	5A0A	7662	1246 1248 7602 7643
X5035	A	002	54EA	7301	7161
X5080	A	002	1854	1306	1230
X51FF	A	002	1858	1308	1234
X5100	A	002	5A0D	7664	1233 7624
X5180	A	002	185A	1309	1236
X52FF	A	002	185C	1310	1237
X5200	A	002	5A10	7666	1240 7689
X53FF	A	002	185E	1311	1241
X5300	A	002	5A13	7668	7695
X5400	A	002	5A15	7669	7701
X55AA	A	001	0D57	0359	0281 0335 1553 1554 1630
X5500	A	002	5A17	7670	7709
X5600	A	002	5A19	7671	7715
X5700	A	002	5A1B	7672	7721
X5800	A	002	5A1D	7673	7727
X5900	A	002	5A1F	7674	7735
X6000	A	002	5A2D	7681	7779
YFLAG	A	001	6188	8217	0208* 0394* 0400* 0437* 0624* 0630* 0749* 0753* 0762* 0813* 0895* 0901* 0926* 8056 8060 8133 8135 8226*
YYYY	A	002	618D	8220	8058 8059 8062 8063
ZERO	A	002	0D62	0365	0162 0172 0243 0275 0329 0472 0744 0757 0775 0817 1552 2832 2845 3238 3245 3485 4067 4068 4069 4070 4071 4072 4073 4415 4993 5343 5345 5350 5355 6652 7342 8004
ZEROC	A	002	0FF9	0594	0504 0558
ZFLAG	A	001	6189	8218	0209* 0438* 0750* 0764* 0814* 0896* 0929* 8064 8068 8137 8139 8227*
ZZZZ	A	002	618F	8221	8066 8067 8070 8071

CROSS-REFERENCE

SYMBOL T LEN VALUE DEFN REFERENCES

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

THE CHARACTER • INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

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CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

 GBK GBD   PN 42  34254 EC 825034      SYS/3 DISPLAY   ADAPTER TEST     84aa84aa                  89120000
T+-Y:SJH     B/A  W QU  H &  D BY4  9 M#1+0E+a*B&K#P   /0YU+ DBC*BGBS3   /0HE JQHT|(Q-C2  IQEa &-H89120001
T+-Z5||AU5<HABU|  JO ? /5_2 J_-Y_E  )D%BG /$AP-Z,0NY  HR<E$BW?2/0¬A00Z  ,aY* 0H)$*-<&QD¬   /0H 81489120002
T+-D0E_X09+( a|E   0:|T0*|H5<PN84C  T2)QB  %E0H*BF-D  &BD3 /0D_6)$U84C  0aUCB8%|A&+|I5%F  HB,M )B089120003
T+-,,0H*H2*FI8_P  AS-,/0Q%H#*F<B?X   /0H00H)$*YDHQP#   /0H00H)$*YHJQH¬   /0H00H)$*Y<HQR,   /0H 3-089120004
T+-%WE%BG /DDD0B  G0H*BE%BG07HED0B  G0H*BE-< B63 /0H  E J .E33"B5?30HC  30< aK %-<& (QT5  |B2  ":%89120005
T+-_/aYDHC- .HEY  .0H*.G"(Q-C7"B5%  a  _$0HD.F"(Q0CE  QC0H+  _$0-?  &_  Fa5S 0H*BE-CR5>L  T&|  EC489120006
T+->*a4CH1<I 2)P  I80& C-. /0HE KM  (/aBGPL-< &5¬CN4  a  5-| A/_30 Q$-  a FF9a5T 0-D<$&7  "NJH 6H*89120007
T+-?PNJ.A0 >,0H)  $*-U$QH.AP-?50N0  .'L3"Q$CAP&>"| A  /%|(Q/C0 C¬ 10&7  0C- (aEY.|K (a<   ABa0 8$&89120008
T+-0Ka5T C¬'NDVM  K0N4.:*BGCE*'"6F  00HD(ZaBGPLT30H   1K 5S<D-(#CEHCNU  0K 7>| %<QC3"Q$*  ( &4 3SM89120009
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T+-2H/56V-&    0  AP=Q(#%BGPE0  |"  "| A/_"(Q-|(Q0E0  A*¬P2/2J* PG%aY*  )P E1:¬HGEV0A*:,  2/0a :J%89120011
T+-3CP E1#?HG8C3  "C0A* PG2¬D-?*&A  1:¬"3a/ DP-E1#V8   .=)'L2"&AB9* :$  2¬D/P:|"3aZ DP E  1aT  )ZU89120012
T+-3= E"W0NY(?14  AP=R1aYD<0H*(?aB  GPE0 D&  P-AP958  A9>99""|2D J* PG  W¬M'P4 JD0NY(%3S    -Y K#*89120013
T+-49aZ +:AC20AA  $97U&a% &0"V) PG  54HDGP&A0#(8ACV4   *+T&-JN) GCZ4HD  *P&A0#_8AH7U&a?H  &CU0 :EM89120014
T+-54 ¬IE870 a"(  Q-(BG C588-| -&8  +aY*6   ADV0D""a  B / J       CR5>L  T&|J 5_)-1<PC&(|  00*& R-489120015
T+-6?&EA 2<LB&+|  E8>( L¬C00|GFP¬(  Q0CAHP=Q( N"WCN7   -&H0C D(M05)0H)  )ZQ KDAG /5_2C/D  + *  :Q489120016
T+-7D/0>?0H)$*/   &QD¬ /04&| A/> 4   P=N¬9%BAC(*+ E"  VN_U( E"VP=$ -&7  /||'/> a P=N06*B  GC(* 40-89120017
T+-8V      BH 5_)  1<PC5%LE&<&A2)|  U6*ME AGP0H*BF-D  VDBC /548C D|'-"  #|  |'30 Q$*a FF  8|   #L 89120018
T+-9-Q$X30<CB &a  CC¬'NDVMK0N-+&*B  G07HIF6BS0N8+SaE  *CY%a"6F00N4+NL0   0$C30H&a  70<NU  (a 8 7 %89120019
T+-:$  700-%'H 7  00 D+P|(Q0 7"NJI  ND%E)CX" /1A |¬'  /%<BADDC /548a5S   <Q-(QTBHC:01S 5  R<H- 1 %89120020
```

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-#CC;8@BO#6||'	/_04AC;O(#?AHTO	<C?Q@@FF7C& (:07	_@YDJC& (# 7>&-D	O| 4+'TO|Q$*< #	YC?Q ¬J889120021
T+-@JC D(M5Y.C E	¬9-7%OH))ZQD	< N"WC;# /56V- C	""30 Q$¬3OHC3O<A	* PG6@Y*UP E1#"H	GGNO ;8H89120022
T+-'< PG,@Y*OP E	1#¬HGC5O@*¬G2/O-	@"O"7P E1@72H.7D	*PX"'|H&AE8A*¬E	; B"V¬Q@?4 &>P G	Z@7O NY@89120023
T+-=GSE)8""L2U J	* PG3< A¬9%EEDE-	) N"W*¬HAC<BGDEI	/56V-AD E8 N=N	: ;X1;¬"4@/ DP E	1:P4 RSU89120024
T+-"BT5¬&AE$AO/A	<+H BB?H&CX-&@@	&DHJ9D|| DABOP&E	1'_BAA54 *+"&-&9	) GCD4HDNP&AO#(B	AGE4 KQH89120025
T+-"' GC14HDT;JC	3@/ +L G3C=Z@ IL	3OHC&/O '&-YCOHE	|:?HG+&D-H& DVN	ND?"" -H C	16)Q ¬-&89120026
T+/ 89+('HCO56C	D1*(4'$A1DA&&<T	DOUCT1:.T&D72@FC	31V73O< OSE"WC&E	¬9-"#OHDBE-OACN<	|=@ .6-H89120027
T+/A3/56V-AHO<*B	GO7H+D&8AOH*+J*B	GO7H&DFAGOH*|ZTO	Q$-(E"VP=$ -&'	_C-A¬9N$RC&A¬9N"	WOHD 1&-89120028
T+/B>DCY@"6F8COA	¬9N$ROH*\|$L&HDJM	4 JD(O-DJU¬(QO|H	GC3&HDJM4 JD(O-D	JD"(Q-C&AD(-OSAD	P<HU 71489120029
T+/CIDJUOS/D$<H%	JGLB<DJ@OTJD/<H8	JH3B|&KP /OHE-&O	J5<βG /DA(/E$O-D	JH%HBDJQ4 JC1(H	&#@ N,Y89120030
T+/DU/OH; & C	S -E'"OG2-&¬K &|	/1C/OH*BFYQ6D*¬	B & O-H <BG		PIQ89120031
T+/E¬ <GD1(V QDC	2@DC2@MC2@UC2@4C	2'DC2'MC2'UC2'4C	2=DC2=MC2OMC2OUC	204C21DC21MC21%G	D1(U '1Y89120032
T</FE&FA @"A @"E	@"I @"(@"J @"N	@"R @") @"/ @"V	@@E @@I @@(@@J	@@N @@$DO;|A&FA	9=* '0 89120033
T+/GN&+¬X&+¬X&+¬	X&+¬X&+¬X&+¬X&+¬	X&+¬X&+¬X&+¬X&+¬	X&+¬X&+¬X&+¬X&+¬	X"@TDOUCC5_PT1)P	T8- ;9Y89120034
T+/H& 0 DY¬ /OH	E JUK/<HAD;)@ FJ	¬ QHB@5S @5T <M@	(QTA|P=R(FJ¬97H	AKCO Q$*@ FF8| A	/>L4 @A489120035
T+/I. JI.OHDKHC3	"Q$T /1ID<N-(QTA	|DYQ| AHFN_U(AH	FP=$ -JI ||'/><8	GDU&@"6F9OH)|Z&&	L :&M89120036
T+/HFL-AUO-_+ QI	EB54A-YL2-&*1O 5	S4H*JOH*BE- &G	R5>LT&|R 5<XA6MC	R1*) 2)PC6MCT1;.	T =3Y89120037
T+/.AAO P|<BG /Y	AE5UP|AAQ$3O Q$*	@ FF8| A/>¬(Q-|(	QOCEQCO.3OHC3O<	OO 7$@5S @5T <N-	(O¬< =Q089120038
T+/.@OHC3O< OO 7	>C&D(# 7>|A&LH33	"Q$¬2-KH(7,C;4	@EJ<T||A/_"HAD&4	C;O(#?HA<COOD2<	@C&D #&Q089120039
T+/<7_OO D1MLH0@	ANX(O*OOAP=Q(#<B	GPENA C E¬9-7	>OH))ZM "@@ FF	7)< LLC3 D9D@FAJ	.|H &&889120040
T+/(2N%"8 - (I	O*@8GE%D @5S @5T	<D@OOTO&E%H1OAE	GON8OU*E*EZDOL5"	WC&A¬9/$8O OO>08	E%H @9*89120041
T+/+_O-$+ JEQNXG	S -D4 VR3C&EO*5$	VO &LN¬(O-|(OO<H	B 4 VR3O-EP *B	GE%D <E/¬9U0A N"	W4¬D @9Y89120042

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/|Y %E)D#O(N"	WEZT2-RH< JJ(EZ-	@ FF8| A/>L--NW"	DAJFC&A¬9N"WOHD	L9C3"Q$T /1JF(I	O*04 KIU89120043
T+/&T NR3.$3 JJ	F|&E¬9%BAEDH' V"	WOHDM&T4DP=$ -JJ	B|&/¬9%BAEDH'DE"	WOHDM&T4-P=$ -JJ	B|M NY889120044
T+/J;P=$ -JJB|QA	¬9%BAEDH' E"WOHD	M&T3"Q$T /1JF||'	/>"BGPEN C-D	OWER18-HA(IO*34	NX< #/089120045
T+/KRO DLY@HAN0D	' NR2OH&M-C-- -,	UA+TOH)NR8C /1+	T|&IO*%BDEIU8H H	HOI LY@BGNO) OH*	LY34 MS@89120046
T+/LM 5R2OH&M%T-	- -, UA+TOH)NR2C	/1+T|&JO*%BDE<%	8H HHOI LY@BGNO*	&OH*LY34ENX. /AL	U+B 9ZM89120047
T+/M| -, UA+TOH)	NR83 /1+T|&RO*%B	DE|48H HHOI LY@B	GNO)<OH*LY34GNX.	/AMO+B B&%B&D:|	/5M @L 89120048
T+/NHR23 /1+T|&/	O*%BDEL*8H HHOI	NH@BGNO*** HHC<B	&EY7 /1+T|&VO*%B	DEN 8H HHOI LY@B	GNO* 5L089120049
T+/OES%BGD:<'BVR	2OH&NEL— -, UA+	TOH)NR4, /1+T|&_	O*%BDEQH8H HHOI	LY@BGNO*DOH*LY34	<NXH JO&89120050
T+/P OH&N-T-- -,	UAE(OH)NR1, /1E	(C&EO*5$$O &LY3-	- -,2U P /5NX-<H	ANOG /1$H&CAQP=R	< &D =9089120051
T+/P#P=$K &.APJ+	@C&E¬9/EQOHDN6<B	GD#O+ JEQNXGS -D	4 VR3C&EO*5$)O &	N>T-- -,2U P /5N	X&<H KZD89120052
T+/Q6 N*AOH*O2S	ODE"WL DAP=$K &.	APJ+@C&E¬9/EQ@YD	DOH*L? 8AEZ/O*;H	B L&BNX<(NR3N_"	AAQ OHU89120053
T+/R1AC-- -,2U P	/5NXH<HANOG /1$	HDCAQP=R< &E¬9_H	A %E)D#O(N"WEZT	2-&L /1+@C-DOWER	18-H &C889120054
T+/E% L&BNX<(NR	3N>G AAR(+B BB?H	&A*BGNO*&OH*OX*B	GPEN-EO OH*OO36	NW"2 &-3&ER?OH*	L+T4)$489120055
T+/$X&ER?@-D&|BA	O$@BGD3, /56VAAY	|(Q-<BG /Q4BA*	9(DP<L&BE3M4AA*	8(&JO93HAE3XK &D	4 J* NI&89120056
T+/*S<LS NW"2UA	< JEQN>*< NR1N>¬	/1*D+DAO$"H&D O	AEZ-(O&OANXEO9@B	GE2Y8HER?@Z <C E	O*NO Q8D89120057
T+/)): OAEZ/O93M	DE3?8 & O-H <B	G - FL3 /OH	E K<QD@HAFD73QHC	3O< < J-8FF < J/	OFE& NL*89120058
T+/;QC DQ$//OC D	P=A/SC DQ*EY(C D	Q$//QC DP=A/UC D	Q*A/EC DQ$//*@Y*	KC DP=A/WC DQ*EY	&C D $2Y89120059
T+/¬LFF8QPTEQFF8	(J/>FGC2 &&1OEY	HCODQ$//+C&DQ$VY	HOH&PX¬(Q-|(Q8<E	)FG4< J/&FE.AUA/	1L)U KQ@89120060
T+/-+ A/+C-DQHA/	+OB P3?(QOCAQP=Q	(N"WE"T2-&T /56	VDAO <BGOJSGFF*	Q$ O|F|ORCCYANM4	8 &Y :D489120061
T+//IC|H&B%BGN|8	;P |2/O4<C1T@FJC	/5L=G5 CC&E¬9VN	&OKDBE%BG /DAMJT	@OH*BFYH,FL? /5=	"OH* &A%89120062
T+/SD /Q D |	AMHA&"5G"HQAK"5|	"N(1J7EI*M_1* 5	M < OH)$*S	JG.| /1¬/OH)$*SD	&QD* E3@89120063
T+/S"OH*P2(XO9+(	=DCM2*|R5%|O5;|	R5_|L1)V 1|PAO_|	E&EA O_$S@ATEO*I	8@TE&<$O4*|O9%X	N14 LH489120064

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/T:QDCU1+(8%G	Y8UC%O;¦A4%GNOMA	(1%PA84_ O'$D1MC	2'"C7PMCS2($U4@J	&DA &DA &DA &DA	&D "ED89120065
T+/U5&DCN5>(O%N	2¦PS8@GL4@PD&DA	&DA 1*XT2<PR&+L	D84CO6MCF1*GT9(X	E&+¦I1MCU54CM0;/	O%M OE-89120066
T+/VO&+$R5_PG8&	RD%HAFND*ANY8L%B	G /YAFNZFOH)RFH*	RYAWZ@5S *M-O<MU	(N%BGN¦8VM L3OH	OKE@ '9@89120067
T+/W,9/4AP=QO@YD	HOH)¦ZK W ¦@OKN"	WG&E¬9UL2-&T /56	VHB)ND%BG /$O=MA	8_<&&AE DU L&E	DB- 3:089120068
T+/XWFW?B JW"G N	E+A" /OHE JVEJ%B	GOJSCF:DEE?(Q-GE	HH*BGN¦8DMDL /OH	O@<E O_$C H &&IO	CM H 2C%89120069
T+/Y/U+DJ&I4 W&F	MBN HU _&B/E X&H	R 9&&M =&DV JDMB	)AIUEVA)&EZ RMA-	J&I4FW&;MGV)UBA	&G1D *8D89120070
T+/Z*&I4HV&WQIN	UUB)&1/E X&DNB9-	%MB>&.V _DMB)CIM	(WC(&<Z 5MC&J&I4	+V&=Q+V 9UC1&+1A	XC@ @1 89120071
T+/DPMC:Q&NA VD(	&&ZD&MD&. A,60-D	E-AOEOT/XOH*BF-D	ROU$ /5UQ-1,YF?P	3OH 1K 5S<MU(N3E	HCN* :OH89120072
T+/,KOH)M"S'&A?(	Q-CAHP=Q) N"W(-H	AB<BGPEM-<EOD<DV	¬9/4AP=RI@YDHOH)	)ZK 1""@OKV"WG&E	¬9V4 O,Q89120073
T+/%(@YDHOH)¦ZK	2'E" /OHO@<I 8%.	NQEN/DWHDQ5NU'OD	?M Q< A_VO-D$B1O	EOT/¦OH*BF-DROU$	/5U 3T%89120074
T+/_HFH<$O1_U@5S	<MY(OLEICN¬ /5L	=(V D@5S <DZ¬9/4	AP=Q1@YDHOH)¦ZK	7NEYOKN"WG&E¬9UP	2-&- 2S@89120075
T+/>COH)¦ZK 8AHC	/OHO@<(8%.FIH,	EN*.#07'&A 4 F'L	B J_:G NE+D" /OH	E JVEJ%BGOJSCF@Y	$4"< "JV89120076
T+/>=OH 1KO5R<M1	O6@BGN¦8@M L3OH	OK5"WG&E¬9TG2-&T	/56VHC9NDTA<P=Q	) N"WJ¬HAB<BGPEM	-¦"@ N9Q89120077
T+/?9 <BG /$O1DA	2*(6NP;D;¦'9 E	DC- *<@HAF=U*ANY	8F*BG /YAFNZFOH)	RFH<* 1O2OH)M"UI	&E@ JJY89120078
T+/O4/OHO@<N 8@.	N;VN#D?.CX&BR RM	B=V2) 9UDV _&B?%	:X&ONAZ-&M "#-ZO	LMAHQEN MVA)&EV	PCO #Q089120079
T+/17G1,8 J1HG N	E+AX /OHE JVEJ%B	GOJSCGFH*W*BGN¦9	DMA? /OHO@<$TO%$	R;VN#DX2%¬$5=(P'	AS-4 3HM89120080
T+/2DX&BR RMBS-2	) 9UDV '&CY%+X&O	NAZ-MMA+.C9OPMAE	QFN QVA_&FV $D"	*:*HAGH@*ANY8F*B	G /Y M.<89120081
T+/3V JVEJ%BGOJS	CG<U*:<BGN¦9HM "	/OHO@¬A &+¬R*"'	1 G.LY-GS490GM E	S =H%X _&BD<B8'+	*C5 R *89120082
T+/4-CV !D&)+<H	AG¦8*ANY8F*BG /Y	AFNZFOH)RFH<)FA4	7OH)M"U/&C@BG /$	1@MCC2)V=PG'Q!YE	1P.8 5:@89120083
T+/5$AZ4 W&FN ,8	AX _&B,@+V 9&CR4	CM @K A6IO-D)LJO	EOT-ROH*BF-DROU$	/5UQ-15XGQT /5L	=JV *Y489120084
T+/6OD<BG /$1@UA	O@V@DX57#.S) IU	AV&.%DZOIM T_¬94	CV 5&C+57XAA&C5	&DO :U@HAGRX /OH	E K* O.*89120085
T+/7JG;# /5UQUJ7	?GT. /5UQ%/83GV.	/5UQ_A9LGX. /5U	QDA93GZ. /5L=LV	!OH*BE_XO9+(a¬(	O_U 9 089120086

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/8<&(LIO'XO&($	P&+¦E8>(;&¦GK&<G	D1(XE8)•E8UA&DE	AM I& 3HEM M3A5	GM /&BN HM _&CE	(M 8 ':H89120087
T+/9GM 'O GDA*-I	3 7&D)&N6AX*G; /	9BPYH;O_@CG4(¬-9	"C3DAMBEJ CHBM&I	J 5DDM&NJAVDG<&Z	J8L< 2IQ89120088
T+/:BB5D.M&1JCND	+M&'K EHA<O(K 5H	D< RKAVHGM-/K8NH	HM-%2CVH(< 'KC5<	MOEL T DMOJLAN<	F<&- 5BD89120089
T+/:'MO/LBN<H<-1	LCE<(MO9LC1& G2¬	B J:YG NE+B. /OH	E JVEJ%BGOJSJG%%	¬ %BGOJSSGO<¬I%B	GN¦8 MEQ89120090
T+/#8ME $OH*BE?G	4&<XNO7Y)OJ6 ED	:/B*A5 F;OE7BVD	F1 $&A_ F4 $&I&	Q>-)*D5 KF4 $&A_	F4 QHH89120091
T+/@3M&CD IO$MAZ	&F1Y&F/ EDAY&F/	EDAY&F/ EDAY&F/	EDAY&F/ EDAY&(-)	JDJM G:LB J@@G N	E+AU N#M89120092
T+/'>OH*BF-DROU$	/5UQ-1'OG:¦ /5L	=MV WOH*BE?G5&DC	L6P+D*NM? ==DX R	&AK@A#5O*BV IH8"	TDZO 6KQ89120093
T+/=ZCV ()¬@VD+N	NXA(&DX$"IS¦N"9O	QMA*WE>EDXA1&F2&	OI/LWNRO/MB U(SQ	O9DD*IV VMBQO A"	VO-D)$889120094
T+/"UG#U*ANY8F*B	G /YAFNZFOH)RFH*	¬41"UOH)M"VJ&B<B	G /$1'UCT8_N 8MG	SK+(H9D7VL>RD8E	GM -)/<89120095
T+S ¬EO -&%HAG"P	/OHE J4-I*BGOJS	CHBQ-&*BGN¦9OM 7	/OHO6)$U84C1'4C	S8%R/8>.N&(LIO'X	O&(Q)D889120096
T+SAE54CT1;.TD /	88M¦SK><KADHGM Q	LAD<HM U&BD.U&=N	&CJ- HN. /OHE K*	-;<BGHGXR5>LT&¦G	8&<M JT-89120097
T+SBNO)(5<XC6)R	5_) 8@PS859 @)I	O*LD6*PS8%PSOH)	RFID-DBCVOH)RF.H	-9SC?OH)RF.&-@BD	$OH* :1%89120098
T+SC&OJSYHJO/M*B	GN¦84M/P /OHO*&G	& 5 B%N=*AV E4 /	&A7QF_V=*CE ..DG	&C5 +%N:&DV J* B	OPZO 9BH89120099
T+SD.EV N4&A&E*D	<XA_&F,A¬XA9&G)H	¦4&IJ K1;3¦A&FEH	M-EK VHCM-JKAMH	FM-)KBEHIM-ZKB5H	<M-4 NJO89120100
T+SEFM-#LDNH&*1+	3PZ8NM/JKEN< MOE	L V<CMOJLAN<FMO)	LBE<IMOZLB5<<MO5	LCV<¦M1AOC#A¬X1N	LEG E$489120101
T+SFADZA¬X1VLF(H	JM1YR BHYOH*BF-D	MHPP /2E66)$U84C	1=M_ 4@N 5_1/4'V	5_¬ /5UQ-2FHH)=	/5& 63Y89120102
T+SFA"TZ&H%B&GH;A	6AP*N;BN9(P B*&A	@HSMFIK*VSBOZAQ2	5AZ (_K;&C@OHUAF	5DR LCMO'CI O)VA	7MP- KLM89120103
T+SG7MXVLIEUVSBM	XI&Q+J$8<UBF5AZ	T_K;&I$OHUB;5DR	ZMB,3OH 1K 5O@5T	<M-(O*BGOJSCH-H	SI@ 'S&89120104
T+SH2/5L=¦E KOH*	BE>BDX (& >ENX R	&A$A X V&B#EAX 1	&B.AOX '&C,E1XAI	&DN KF- S@*BG /Y	AF2H RCO89120105
T+SI_M%BGHV¦R5>L	T&¦GA&<GD1(XE8>.	I5*) O*.O9*N @)-	/5UQX2I'HY, /5U	Q@2H.HZQ-¦¦'NR<B	GN¦8 2CU89120106
T+SHYQE E+ HHC<B	& /$ /2HP5 C&)	B4 ¦&A(E4 R7"7¬	=M J& 7¬'M P /5U	QX2.CH_. /5UQ"2.	LH>H MSM89120107
T+S.TH<BGOJT"H><M	S@D @"5NUOH)M"WE	&A%BG /$Q (A4 .	& ' D4 P&A_ GL A	< MOBL (<ADOEL R	<A7Q QBQ89120108

OBJECT CARD LISTING

CL 1 THROUGH 16 | CL 17 THROUGH 32 | CL 33 THROUGH 48 | CL 49 THROUGH 64 | CL 65 THROUGH 80 | CL 81 THROUGH 96

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T+S<: E CN HOD(-  FM N&A/% IH7 /OH  E KMTI*BGH2$R5>L  T&|GB&<.R&<GN1DC  BO)( 5_¬SPUCA4*(  0*& &9%89120109
T+S(R1(XE8> ¯8-O  AIHY(Q?(Q-|(QOCE  QIHO+ KKHO-%( KK  H.*C K<2OH)RFH  T9S&T@5T <M%UI&O  AI8* 5Z889120110
T+S+HCOH: K&X+ H  HC<B&H6O: S&X<MO  UI3YANM4@"5NUOH)  M"V1&EO4AP=QT¬%B  A /QOK2KF@5S <D%  US< 'H489120111
T+S||/OH; SKFID<  < 2KDID| /OH; SK  HIG. /OHE-TUUQ<B  G /DBDSJ2OH*BFYH  KIH&< 6QAIGH< 6P  'IH& EO&89120112
T+S&H|E1V@TO$R¬G  /6|=OH*BH/J*OH*  BES-RIV8XP@$O=HB  &F.QOU ;7E9 IMA2  &FAQO:&+&D¬-AUA¬  ZA9 :J%89120113
T+SJEE¬-BUA¬ZBI  QMA)Y-BUY(T)&F2U  OE3A&BO ¬ CB6*G  NO@/ 6*PG2;.T1)V  8'R 0*LD6MCX9=¬  X&<D "1889120114
T+SK 5*J O%GL&<.  AO'I 8'R 0*LD6*P  S8UCO@|CO4@XN4UC  I5*$O&+$A8UCX9=¬  X4@XN4UCI5*$O&+I  /OU ).Y89120115
T+SK#9=¬X90 ( G U"@BG /Y  AGSK:OH*U>'XD9+(  @*( 2<LB&|GOQ|| F&<GD1(V;&<|I6MC  05@ ¬IM89120116
T+SL6/5UQ-2L|I|#  /5L=<E NOH*BEX(  NM2<T-2+T*:Z4N$&  LX V&BB<T_A+*E,J  CX '&CS+C_D+*E#+  UXAM )S<89120117
T+SM1MAJ&EN OMA*  ) BOCOH*BF-D-IK#  /2M?6)$U84C11DC  H1<I @¬A-@@R 0*L  D6N9 8%TI1>( 5_¬  /5U M8@89120118
T+SN%FH<V&2O8OH)  M"TE&F<BG /R5DSM  VIQMVZPMA)DZ7N$Q  NU -NQ.*NU >6ERO  (E*B7JR &_QE*D/P  -_4M )3*89120119
T+SOXUAO6NROPMA/  &FN EMA_&GE )MA9  &G18 ITL /OHE KU  V>@BGI$3R5>LT&|G  E&<TDOUC1@FC31UC  A1<& Q-Q89120120
T+SP%S6N9 9'V,&+|  B1_V,&<XNO4CO5=.  /5UQ-2P&IT| /5L  =<V 1OH*BEX&D*&N  2AS</I8HW-K;8HDD  ,YY< =IH89120121
T+SQ)IIOHY3KCII  (D3BCIIO&/YK*DD$  G/YK&EJE&/YK*FHD  UXADD=8DUUA4E%HD  UXBA= Q8MUB<M<H8  MXBQ K&Q89120122
T+SRQTU:&HA:&TU:  *H89$UB4$%H9$XCA  &<J@ I,T /OHE J4  WQ<BGIWGR5>LT&|G  F&<TDOUC1@FC31UC  A1<& Q9&89120123
T+SEL6N9 O_V 5_¬  /5UQUKR=IZX /5U  OYSEEI,¬ /5L=<5D  GOH*BEXDA*-I3 7&  (IKDWHS*THB&Z-KD  BH:< H,Y89120124
T+S$+.HD5+E (M&  5;5DB)&*_ZL3'M&R  JA5DHM&VJBVD.M&O  9VND+H X*%HAI%T  /OHE J-XK*BGOJS  CI48 NA889120125
T+S*II7D< K$8N>(  1KC @CENUOH)M"V/  &DCA(P=Q) N"W<|H  AB<BGPEM-O& C&D  W=E$T@YDOL&DOCO.  2-JQ @.089120126
T+S)DP&DO/¬HAEV4  A<H|2-JR< L (Q_B  GC5OA<HP&/O'* LB  C4H*|OH*BE_XO9+(  @?A 5<.A6OGC9(X  A6M OHU89120127
T+S)"8@PS8=HEN&H  D./ ?DK +H&@PAG  *&AMC/D&U *&D+  HXAI&A2Y-H2E&DE  H& ZJ%HAI=¬ /OH  E K* N3<89120128
T+S;:HF7 /5UQ-2T  HHMM@ S/E+ HHC<B  &I9%: S/E@5T *M/  ¬+-ENLL3"NOL /5L  =PE =C&E¬9S;?OHD  BET4 *RY89120129
T+S¬5HE"W@-EV@5S  <D-Y&CAIHDHOKS/  D|(JV=GX"O?H&C&O  DHH%Y133RR¬X2/OY  <ABS.H<H@9WP9OH*  BG-H 'RH89120130
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OBJECT CARD LISTING

CL 1 THROUGH 16 | CL 17 THROUGH 32 | CL 33 THROUGH 48 | CL 49 THROUGH 64 | CL 65 THROUGH 80 | CL 81 THROUGH 96

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T+S-OHD YW<BG /8  AHD<Y,<BG /8AHD&  Y?&OBR¬OYW OAR¬8  Y, OAR- Y?*BG /D  BMBS'OH)T"%BG /D  OC ¬LM89120131
T+S/,HCZNL%BG SH  MP<BG /Q B  A )XO9+( @?E 5<P  S8%GG1MC89<$F1)V  O*LD6*PS8%XN14C  T1:H :C*89120132
T+SSW8=.M8%).&<.  U1%$E6MCE6)XO6MC  D9(XI5*) 9=¬X9=)  ,&<GD1(V ¬UCX9=¬  XE4CDO:|A&<PX5@P  C8@M R@D89120133
T+ST/1DA=&+¬XE4C  DO:|A&(XEO77D&G9  9=¬W6*XT1)XEO*J  H1 UDPH * E1 O  DAMO4AROHM UJDIO  |@8 8,Q89120134
T+SU*XA(&AJ &@AS  &CE QEAB*EV EEAA  &AP."* E1 B&J)RU  EJ$&EXBE&HAD&X8?  3-IOWMAOMDIOZMAO  MDE 5:-89120135
T+SVPGA &8 S*(;  +XCT-DIO@8AS*|V  T@OF*H5 =@OH*H7&  WMB|3 ZOTMC8S BZ  IOH*BF-DQHO7 /2V  >6)Q 4RU89120136
T+SWK9+( @?I 5<.  A6MCI5;|E6*GC8@X  O5*BGOJS|H¬%DE?(  Q-CEHCO. /5L=*E  T@5S <MU(OLEHCNU  1KO4 :S&89120137
T+SX(OLE<CNU1L&5  R<M8(OLE|CNX3J<  1K 5R<MU(OLEHCNU  1KO5R<MO(OLE(CNU  1L-5R<M@(OLFHCNU  1S&4 MY@89120138
T+SYHOLFHCNU1SO5  R<QO(OLF(CNU1T-5  R<Q@(O*BGOJS|HU<  DK<BGN|91M . /OH  QEOJM 5 B*?*3*7L  *)¬@ $,089120139
T+SZC;|'9"2 ZHKU  SHK<ZIBUVHK-ZHKU  -SKFIHYUTSKKIIQU  YSKWIHHU/DKHZH:U  UDKOZHHUZDN&TMBI  &H5& 8A&89120140
T+SZ= V AM HT B>  OH*BF-DQH7" /5U  Q ¬(Q/CERPQ73OHC  3O+C /6GW-E7 /54  8@5SD<NV)$¬(Q-|(  Q8< 8JU89120141
T+SD9/6GW-E? /54  8@5SD<MY(N?(O-CA  HP=$ /6GWSE,3O<  1OB_¬@5S OH)M"V9  & *BGQ;EHP"(QOCE  QH6D 6.<89120142
T+S,4@5S OH)M"WA  & *BGQ;EHQLEICNQ  1K-5O@5SD<M-1W|(  Q8<BGQ;EAQ?(Q/CE  HO-?3O+C /6GW-O-  1K 4 83089120143
T+S%?O"(Q9<BGQ;E  AE@8GOJ-A@5T <E/  ¬9TEQH6¬3OHC3O<  OOE"W@5TUOH)/9YI  _@5T <E/¬9?(Q8|(  Q-|< @0089120144
T+S_DU<&1OB_T@5S  @5T-OH)/9YJ4@5T  D<N-,R¬(Q-|(Q8<B  GQ;E<;@BGOJ-AOH*  BESHDI&|/ ; CAQL  R5>& 59489120145
T+SV84C234CA8=|  AO@TM1)PT&<|H1*|  KI _1@8G /YA<K6  :+ -B8@ & /Q# &H  HOH)RFID_AB4EOH)  RFCH EEQ89120146
T+S?-OH)RFH&_AS5  C+-ENLLOENO|3O<  1KS6@<M_O'<BGN|:  .M/8( N"WH@T K;  :OH)RFH<_JB6A+-E  NLLO 5Z889120147
T+SO$FVNT@5T <MZ  O'CE..$# /5L=S5  ;C&E¬9S?5O DX>%B  GOJS¬.QH_-@BGOJT  3.QH_-2C /5UQ#24  F.M< E&-89120148
T+S1OHCYANM4@FVN  T@5T <MY_?TE..*C  /5L=TEH;C&E¬9S?  HO DX>%BGOJS¬.Q&  _/*BGOJT?.M&_-K  : NM $& 89120149
T+S2JLLOENO|3O<  1KS7 <M%_O%BGN|:  <MA8( N"WH"P K;  :+ HHC<B& /$ /5U  QX26F.Q¬ /5UQ¬2C  /5U 2/D89120150
T+S3<FG( OH)RF+O  _AS5C&CYANM4@FVN  T@5T <MY_OTE..*L  /5L=TNH;C&E¬9S?  HO DX>%BGOJS¬.Q-  _S* 3:H89120151
T+S4G/5UQ¬2C /5U  Q@25D.QE +-ENLLO  ENO|3O< 1KS7D<M%  _1%BGN|:(MA8( N"  WH"P K;:OH*BEVH  ¬0 *3489120152
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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+S5BI '2 B MHJM	E/ NE_ OK8J&&DJB	KAJ &%AĒKAP.*HA&	/EK&|AMO4AR.SEA	JDIHLDABOEZHLG1B	K NH &JU89120153
T+S5'GX@ I '2 B	MHJME/ NE_ O&8J&	&DJB&AJ &%AĒ&AP.	*HA&/EK&|AMO4AR.	SEA JDI LDAB0EZ	LG1 7H@89120154
T+S68U E&G_Q 5 C	Ē (- 6)$U84C2'DC	C5_PT6)$L&+.T5_X	E&+|E8>(L;.K2)¬	P1*J 2*R 8>.M&|G	C&(Q 2 U89120155
T+S735N4 - C	& A& F V B7UOH*	BF-D(.;| /OHO6)$	U84C2'MCS5@GR1KQ	.V"B K74OH*BF-D	N.UY OY-89120156
T+S8>OH)RFH<>K29	;OH)M"WV& TE(CN$	/5L=Ē V G<M-(QTE	ICOH1K-5S<M%(QTE	<COH1L-5S<M@(Q%B	GN|8 =C@89120157
T+S9Z$E IOH*BE_X	O9+(@?R 8=.N&(	I5UCH1<.1OJOHK;A	& UUEM &*BDX/M)	I8V IIO >¬<BG /Y	ACK8 2@D89120158
T+S:U;@BG /$R5>L	T&|.7&+.PO)XEH	>W*BG /YACK:OOH*	BE_XO9+(@?/ 8_¬	A6*MZ B' O-D>D̄*B	G /Y ¬D@89120159
T+S@¬ J4>9*BGOJS	C.>Q?|"(Q8 4)NJI	ND?(Q-<BGN|: MBP	/OHO6)$U84C2=MC	X5<XT&EA 6*|V&+$	O6*& 5I*89120160
T+S@Ē&(XEO*LYMBQ	.-A@DD -G-DC/A8A	BN H&;I CE .&;(	C5 +&;J DV J&;N	EN M&;R FE P&JZ	&FM ;YU89120161
T+S'N9OID&:/AG5	)) AAHV / UJA:J@	HMBM;AG BY <- 6	CY@& KY <DXB K'	SOH*BF-DR.:Q< L	S<CY)&8@89120162
T+S=&C DOIC @C D	OITAFOH)RFH<?Z3	Y<M/O8LO&NO&: NN	(OH)M"YI&(44AF5"	W@YDDOH!KO%BG /$	R5>& NĒ*89120163
T+S".84C2OMCX5<X	TQ)XEO4CA4'(O%X	T8XY MC/& S &HJE	4"=D X V4 GM E&/	6-2*D*OD&B@A@D@ H	&D1H =YQ89120164
T+T FA| AUAQLA ;	A&A*&B ;D&A1&F4D	;MAOGJDG/&S.F U<	U1-ĒHI%Ē K3K6 IO	D̄MCO7 RO_MCN6-1<	&XC* @ Q89120165
T+TAA&J#3 RO+MC(	5"5 5MCR&(OD̄H88Y	<S-6H̄CYY A	& 7W ;MA9HGU&;&/	9AGUB;&E9 D̄IB8U	<S&4 R8889120166
T+TA@S&:IG-J&&B%	<<GB LA7OH*BF-D	O<., /5UO-3B@<<C	3O+ < L S<CY< L	U<CO< L W<D$ /5U	Q-2@ ;1%89120167
T+TB7Z3 Y<M-(QTO	&NO&: NN(OH)M"YJ	&(44AF5"W@YDDOH)	KO%BG /$R5>LT&|.	B&+¬M2;(/6*PC&:P	O&<H '9U89120168
T+TC22;|S* A1*J*	D. 1<<@G /YAFLD	?O-DO8OOA<&MO+-O	A<B&O| OA<B@OJ%8	GOJSC.:*OH̄CEHI44	@DEM JKH89120169
T+TD_RCYANH7 /5L	=/V 7L&D$P=$2-&L	/5IĒ|MHH @BAL"L	/OHO6)$U84C2O4C	X5<XTQ)XEO4CA4=(	O%U 4TY89120170
T+TEY8=H_ CFRO-D	1M%BG /YAFLFOC D	OHT :C DOIC @C D	OITAFOH)RFH<?Z3	Y<M-1WCO&NO&: NN	(OH* R.Y89120171
T+TFTN|:HMC)(J_	¬9?H̄AA<&GMV, /OH	O6)$U84C21DCX5<X	TQ)XEO4CA4=(O%X	T8-EN.- 2J<HA<ĒX	/OH 81&89120172
T+TG;F-DL<)| /5U	Q-3GM<U<@HENUOH)	M"YZ&<@BG /$R5>L	T&|.E&+¬M2;(:*P	R5%PSMC&.SP< D /	"D̄X& 9J489120173
T+THR A<DGO&&A ;	|N %GT4 +M 5A8N	&MAE&DV LMAJ&EN	OMA)&FDGS&+(A9A	H&:MA9UGX&;/A:MG	D̄&;% OLO89120174

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+TIM&;1AI5 VKBQ	DJDG>&>'C.E ,_ =	*.5 >K"@LDIO3M /	&<18D;& H̄SN A.O	2:@HA<VL /OHĒ J*	2-% ¬1 89120175
T+TH̄|/5UQ-3H̄C<>Y	@C5NUOH)M"Y9&.@B	G /$R5>LT&|.F&+|	E8>(6*PCK4CC2<P	C4V OB8V3 A HE&/	4D̄/@ @.M89120176
T+T.H̄AAQDD-&G/DD	<M Z.CV (E&/.8&R	DD -OAGNNDO&G/MD	QMAQFJD%$MAYNBD?	SMA8&BAHDA8JAH5	/K=< MIY89120177
T+T<E&=JH̄9MHYMB*	FJ.&FXB1&H̄1<&VB'	& 5 ?G-J9 D̄IM D	O C|5O-D2=@BG /Y	AHL(&OH)RFH<3ML|	4C D 8.O89120178
T+T(NO&1W<BGN|:	&MC%OLN"W@5S <DU	3H̄14AP=QO@YDHOH)	)Z&SJ C /OHO6)$	U84C3@DCC9(XA6MC	S1:< 3/Q8917?0179
T+T(#&<LU6*XN14C	R1*(1<GTONA<B8V	O GD EOJ2AP+D̄)?D	¬AA%DD -G/UD+M O	GJAD&XC+2 IOMMAS	3 RO P$D89120180
T+T+6E5 QMC3-A9O	$M ,/8IO;M Z&&N	¬%/D̄*H5 V%1>*IV	585O*|X *&A2 X(	NM Z6@X *& PAA%	HN Y RY 89120181
T+T|1DAA&D;$2XC/	&+7H *O ¬8E #DOJ	&8=$2XC/&.P *&A	MK/D&UD<&D+B XD5	&&2Y-H̄2E&HEA(G-J	9 Y K,%89120182
T+T&%SN A<& 4W<H	A(P /OHĒ J44+@B	GOJSC(CO4VOOANO&	1W<BGN|:LMB¬ /OH	O6)$U84C3@MCX5<X	T&<H 2Y@89120183
T+TJX2;(@4CF6)$	M&<|U6*GRMBY.SP	E*ĒYPA8H HOE6@1@	D* A1 A HA8RAC5	(A4KO ZOLMAO1 9O	P&=D @,@89120184
T+TKSMAVCFN QDJ8	*H̄+ HXA9&8=G-X8E	&B=(NX8RO XENM &	¬BE XDAA&B18D;&	H̄SN A<- 5O%HA(H̄T	/OH J.M89120185
T+TL)F-DK((7 /5U	Q-3L;(NU1K 5S@5T	-CJH4D̄CKY@5S OH)	M"ZV&(%BG /$R5>L	T&||2&<GT8@GC2DC	R8>< $S889120186
T+TMQMC)9 D̄I@?=	*GG."HBIO GD FOJ	&B18DG &¬AA HID<	KAA<DD &G/E NA8J	AFE OA8J&F-;DMA_	8MD Q 089120187
T+TNL8U#TK=J(9J	HD-&LAA8DA8J6-AR	'/B&I4GWEOJO PD	SGO&G/DD2MCAO GD	NCR&(N 6H/A9 >	ICHU LB*89120188
T+TO+CQU+SN A<O	5Ē OA(RQ5X@BG(Q&	4 CN6C D5VTO/OH*	5/CM (Ē&< LQO(Ē|	/3DDOH*BF-D+(R7	/OH ¬K889120189
T+TPIE_XO9+(9=)	8_¬A6*N.@"|3'||	5(- 6D%BG /YAHTP	NOH*55_XO9+(@"R	O>.COMCS2)R 2)L	M1*& OA&89120190
T+TQDPUCE5*G8Q*L	I8%GBOH)RFH<6ACQ	JOH)M"TN& ¬(Q8|+	HO<BGN|86M L3O+C	3SMC /5L=(5 FOH*	8EU* *H̄%89120191
T+TQ" E AJOJ& V	DJON&AT* (_" /OH	Ē K46L%8G(U"R5>L	T&||7&<.SO@E 8%X	O&<XM5<PDPUCE5*G	BQ*& QT-89120192
T+TR:2;.AOUCWQ;(	.5U_ 6*PQOH)RFH<	6Z3$;OH)M"TR& ?(	Q8|+HO|(QA<BGN|8	7M T3O+C3S L /5L	=+E E2D89120193
T+TĒ5B"(Q8|+H <B	GN|89MAC3O+C3S L	/5L=+V L@5T-@8S	OH)M"T_&E%BG /R	G DQAM IGAN CM)	&AUQ)$*89120194
T+T$OAV HJ/V&BN	.J1)&CE +J-9&DDQ	LMAE&D4QMJ1N&EV	QM @RBDQ.MA%8 C/	COH*BF-D,(1X /3*	Ē6)Q ;ĒQ89120195
T+T*,9+(@"/ O>.	COMCS2' 5)$NQ<X	M5<PD2*GT1MCA5*J	82XO&<.U8>T /5U	Q-3-A+D. /5L=(5	F@5- K.-89120196

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+T)W8<FH(4|3S<C	3S%LAST).OH)$*U	OQ|¬ /5_2E&'-O%B	GN|88MA? /5L=+N	-95T-OQY7*?+HO|+	H1<D *9089120197
T+T;/ST)aOH)$*UH	OQ|¬ /5_2K&'-O-	a8S OQY76LE.CO.	3OH 1SO5S95T-a8-	DOQY7=LA.(7%(L)	#COH 7Ha89120198
T+T¬*O D78¬(Q-CB	.(7?3O+ (L)#CO.	L¬Z88T 98, 95S	<H%7;"(Q8C6H(7?	L¬1a5S OH*BE%B	GO7H)LH89120199
T+T-P&O'-O%BGO7I	DEWE6OH)$*UMOQP$	/5_2J1R/)%BGO7I	HC6CB* WHB*-IY	X-E-EM RQB5 GM Z	&B, PL&89120200
T+T/KE?O+M 67HIO	JMA UJSNG)%J7S,&	FXA/&E#MGXA_&FV	$OA9&GJ<HOA'&HCU	+$\| /OHE JO8$%B	G+Fa 2H489120201
T+TS(6)$U84C3=MC	B8%|A&<XN8aPR6;L	P84CT1;.T&<BGOJS	C+E*9%?(Q-|(Q8CO	+M33S<.3S 5YCV	.| Q-<89120202
T+TTH+M33O+CAS3U	:OQO8Ya8GO7H9G6C	/OQU8,aBGO7H:G6C	/OQU9GCOA+M33S .	/3S=|&H9L< A+KL	3O+ 8LM89120203
T+TUCa8T OH)M"UN	&"(Q8<F<++./5_	2JA'-8¬+H-<F<+L.	3OHC /5UQ ¬(Q/CE	RPQ73OHC3O+ a LV	<(E "Q889120204
T+TU=+M?3S<./3U	(|&H9L< A+M.3OHC	/OHDOH)$*UHJOH*	< LW&+Q# /5_2&1-	9Z%BGO7I DOBGOH)	$*UD &1<89120205
T+TV9DOBGOH)$*U-	KQR 9L& LV<OHD	9RCH-+Q,3S G /5_	2+&'/|TOB+M33S D	LV<OHD9-TM-+Q3	3S D R D89120206
T+TW4OH)$*TO|QL#	3S G /3V(+NO9;_P	OOa|I5;|E6)XU5=|	S&+|O5_I 5'|AOaN	JOI& A&DM <MAE	E+- OZa89120207
T+TX?+DX /OHE K<	99*BG+;$R5>LT&||	A&<.SOaE 8aXO&(P	O84CR1+//9(PI84C	C2<PC4?(Q-<BGOJS	C+Z< *,<89120208
T+TYD+DT3O+CASCY	AOH)$*TULQOC3S<	8H Y+OI :D<F +/C	ASCDC88S OQ-:HaB	GO7IAD6E-95T-88T	OH* aB<89120209
T+TZVN|98M L3O+C	/5L=&5 F95T-88T	+B HC%B&+U3A-CZ	<OQ-:O<BGO7HaD6E	-OQ-:E<BGO7IID6E	-OH* E2-89120210
T+TD- /$ /5L=JN	H95T-88T a8Y OQ-	:S"(Q-<BG /$ /5_	2+-'/L*BGO7IDC6E	(*"a?Y4*DM I&AAD	DM O JO%89120211
T+T,$D&K"Y9 |M Y	# D O-D:7aBG /Y	AHT,;OH*:7'XO9+(	aaI O>.COMCM5%L	E&<|YO'|E&+.T1*G	L&+< 5S&89120212
T+T%O1;.TOH)RFH<	#?31EPOP$633"+#X	/5L=+5 Da5T-OQY	#E|+HOCF<+#33S%L	AST%*OH)$*TOOQ|¬	/5%)Y-89120213
T+T_J*T4|Q<./5L	=|V /P&EP6|HACJO	AP=$QOH))ZK "":Z	) O?EaYD(G E¬9_,	/56VHDANHG4 52H	AAX4 &-&89120214
T+T>< (?2-JH* E"	V5/O P=$$OH))ZKA	A C3SHCAST>Fa8T	<QO#?|+H1<FH+9$	/5_2JAR-'aBGO7I	EC6 *#D89120215
T+T?GO%BGO7IFC6C	BOH)M"UI&|?(Q8|+	H-<FH+8# /5L=J5A	<a5S OH*BE-	C>6 AE AMDJ&J	& 5 :/D89120216
T+TO8AE-GM MNADM	HM V&B5 <M 5""1U	DKAE&DD-J¬:YRAD-	OMANHEX'NF&JHF5	EKA_"HAUDKBA&G4-	-MBD)TM8?120217
T+TO'MDI&IE VMB$	?"9OZMB-QAD-%MB_	H.+=DXCA&.1-DKC(	&<U-3#5O*(5 6F J	H+V 9KC,?HIO=MC5	&|UM E-O89120218

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
TGC1E&NA MDYNADN	EMD&QAD/HMD)HKE	WDO/ELNA<MD4	....	....	..... 8B*89120219
T+T"8M A& E AM I	& 5 DM N&AV GM /	&BN HM _&CE (M 9	&C5 &MAE&DV LMAJ	&EN OMA)&FE RMAZ	&F5 2,H89120220
T+U 3GE)MA9&G3O	JL? /OHE J1 HaB	G&B3R5>LT&!|C&<L	R2;PE6OGR1*|E2;P	E6MCW6*GPC DOHT	:C D 7:a89120221
T+UA><B&O| OA<BQ	OK<BGOJSC.:*OHCE	HJLY@DENUOH)M"V'	&G OA<BHOH-OA<B&	O| OA<BQOKC1 JL-	@DD& 9# 89120222
T+UBZ&aBGJBQ< L	S<BO< L U<CO< L	W<D-@OMM8|AED&@B	GJBQ< L S<B8< L	U<CO< L W<D-@OUM	8|AH MQ<89120223
T+UCUJD| /4&W+ -	HC<B& /Q< L S<C	< L U<CO< L W<D-	@O4M8|A(D&@BGJBQ	< L S<CH< L U<CO	< L R8D89120224
T+UD¬ITAH|<JE+CO	MJD| /4&WC DOHT	4C DOIC @C DOITA	H|<NE+CONJD| /4&	W+A HC<B& /Q< L	S<CO &Y*89120225
T+UEEC DOIC =C D	OITAH|<RE+COOJD|	/4&WC DOHT 8C D	OIC =C DOITAH|<)	E+COPJD| /4&WC D	OHT #O 89120226
T+UFNH-OA<B&O|-O	A<BQOKC3HJL-@HDJ	COH)DIT--B-3 U H	OC DOHT %C DOIC	=C DOITAH|<VE+CO	/JD< JJO89120227
T+UG&OH)DI-OA<BH	O.-OA<B&O|-OA<BQ	OKC1HJL-@HUJCOH)	DI-OA<BHO< OA<B&	O|-OA<BQOKC1.JL-	@H4& #-889120228
T+UH.&@BGJBQ8& Y	<OI BE-OA<BHO<-O	A<B&O& OA<BQOKC1	<JL-@(DJCOH)DI-O	A<BHO(OA<B&O& O	A<BQ :,%89120229
T+UIF<D-@LMM8|CN	D&@BGJBQ< L S<CQ	< L U<D < L W<D-	@LUM8|CRD&@BGJBQ	8- Y<OI BE-OA<BH	O+ O #2489120230
T+UHA L U<D < L	W<D-@L4M8|C)D&@B	GJBQ< L S<BY< L	U<D < L W<D-@MDM	8|CAD&@BGJBQ< L	S<BO @H@89120231
T+UHaC DOICA C D	OITAH|(EE+CO1JD|	/4&W+ DHB@B& /Q	< L S<B8< L U<DH	< L W<D-@4UM8|DI	D&@ M2089120232
T+U.7/4&WC DOHT	OC DOICABC DOITA	H|((E+C1CJD| /4&	WC DOHT 2C DOICA	BC DOITAH|(JE+C1	DJD< "9 89120233
T+U<2OH)DIT-8B-?	U HOC DOHT 4C D	OICABC DOITAH|(N	E+C1EJD| /4&WC D	OHT 6C DOICABC D	OIT 'YD89120234
T+U(_KC3OJL-@JUJ	COH)DI-OA<BHO+ O	A<B&O&-OA<BQOKC3	PJL-@J4JCOH)DIT-	DB-? U HOC DOHT	DC D 4H&89120235
T+U+Y<B&OJ OA<BQ	OKC3QJL-@MDJCOH)	DI-OA<BHO. OA<B&	OJ OA<BQOKC3RJL-	@MMJCOH)DI-OA<BH	O.-O N&@89120236
T+U|T L U<D&< L	W<D-@OUM8|EID&@B	GJBQ8B Y.OI BE-O	A<BHO< OA<B&OJ O	A<BQOKC1$JL-@M4J	COH* O2M89120237
T+U&:JBQ< L S<CH	< L U<D&< L W<D-	@PDM8|EJD&@BGJBQ	< L S<C&< L U<D&	< L W<D-@PMM8|EN	D&@ 1 D89120238
T+UJR/4&WOH*BET&	HJH| /5UQ-2=X<B-	1KDM:|AANRCYANM7	/5L= E 7C&EDJN"	W@YD1OH*BFYD'J(3	/OH ¬EH89120239
T+UKMFYD4JJC /OH	E-S)E(@3G /8AJL/	DX@bG /D8GDK¬OH)	KO%BG /$ /4K 1%G	I4@XN14CD1;PIO@N	O*& "Z<89120240

OBJECT CARD LISTING

CL 1 THROUGH 16

```
T+UL|1(XE8>I 2;I  9=¬P5>$E6OCO1%R  5_V 5_¬E5MCC5%G  X&<GT&<E 8@PR5<X  NO)( 5<XG2+( O@G  U8%M ;JQ89120241
T+UMH&+|H2;I 1%G  I4=LR1)$P1)PI5*)  8@TE&<|OO:) O:(  8@TE&<|P9DCW2)|  L&<GV5%XD&+|H2;I  1;* @/%89120242
T+UNE5'$S9(XEPE1  *&<.E&+.U6*N 8'R  6*PC5_PN1*|T&<G  F8@PR&+|E8>( PE1  *  (C|&AEK&OA(RR  HO%  @ U89120243
T+UO /3OD|-AEN0O  A(RRH1<BG(Q&"-D,  EOH*BF-D>JRL /4O  N6)$U84C31UCD1;P  IO@N 5'$L4@XN14A  (8_H LLU89120244
T+UO#2)¬P1*J 2*R  8>.W@UCI8UCO5N4  @"4Z6CA9H)MZ6||'  HV-O;KZNHVT1 KU8  < MDU<BY< MDW<C3  /4U JZ089120245
T+UP61T3AKU8< MD  U<B3 /4XF|<IHL-O  AKD&O.%BGK*Q8B Y  <OIAG_33CKU8< MD  U<CC /4XF|<JHL-O  AKD& M,Y89120246
T+UQ1<C. /4XF|<N  HL-OAKD&O(<BGK*Q  8D Y<OIAG_33FKU8  < MDW<C8< MDU<C$  /4XF|<)HL-OAKD&  O+< 2ZQ89120247
T+UR%/4XF|</HL-O  AKD&OH%BGK*Q8H Y  <OIAG_33IKU8< MD  U<B3 /4XF|DZHL-O  AKD&O.%BGK*Q@K4Z  +C D @DU89120248
T+UEXKD&O<<BGK*Q  8& Y<OIAG_31<KU8  < MDU<CH< MDW<DC  /4XF|D5HL-OAKD&  O(<BGK*Q@LUZ+C E  HZC K:%89120249
T+U$S(%BGK*Q8- Y  <OIAG_31|KU8< MD  U<CT /4XF|EAHL-O  AKD&OH%BGK*Q@4MZ  +C EHZC %OH)I1T-  AB-% 2HH89120250
T+U<)OIAG_33KKU8  < MDU<B8< MDW<D.  /4XF|((HL-OAKD&  O<<BGK*Q@5DZ+C E  HZC 2OH)I1T-BB-?  UD* @1*89120251
T+U!Q_33NKU8< MD  U<CL /4XF|(RHL-O  AKD&O(%BGK*Q@54Z  +C EHZC 8OH)I1T-  DB-? UD;7|(/HL-O  AKD& OQ 89120252
T+U;L<BY< MDW<DL  /4XF|(VHL-OAKD&  O.<BGK*Q@DUZ+C E  HZC >OH)I1T-HB-?  UD;7|E_HL-OAKD&  O<< 2Q%89120253
T+U¬+/4XF|E1HL-O  AKD&O<%BGK*Q@PMZ  +C EHZC 4OH)I1%B  GJ#¬ /OHE UIH3 O  AJ@/HMT7" C -M-  BC D ¬#&89120254
T+U-IJ'RHMTJ" C  -M-HC EG9U¬OC A  HL- OH*BG-EHLUT  )OH*BF-DJK(4+ M¬  ON_X /4¬LOH*BF-<  DK$% 'BQ89120255
T+U/DOH*BFZH< M-  QKV '"O OHEH/@B  G /YBODU5C EH.UZ  &|¬@ <BAKEY< M-  =KB8< DZ+ C /OH  ; MY 7-489120256
T+U/"LUT)OH*BF-D  JK(4+ M->N_X /4-  ,OH*BFZ. /OHE ON  IW%8G /Y8GMW7|E9  V@TO"R¬D<BCQAK*P  /6< MS@89120257
T+US:"%BG SHAP%B  G /$T2<N 1_$L4'$  W2)PG&(XE8_¬O5*L  E1DCT5UCA&(¬O4'(  .&D7T2<N 6*PS5'$  N8%M )3Q089120258
T+UT5&+$A8UCN5>(  @@TEO'.E1D_)1<P  V2*|E&<GD1(XE8>I  9=¬T2<N 1_$L4'$  W2)PG&<TA9*N OMC  C5%D $ G89120259
T+UUO94A'5'$R875  O;PA2)|AQ_|E&D7  A8UCP1)V 9<LTPMC  B9+( 1@XV1MCN5UA  &(XE8_¬O5;.E&+|  O&<D NKY89120260
T+UV,&(¬O4'|I1UC  D1;PI@@N 2:I O'$  N5*PC8@PD&<GN1DC  HO;I 5'$W1)V 5_N  ,8>LS5@PC84CC5%G  X%<D 7SU89120261
T+UWW5*J 1<PV2*|  E&+$H2)|E&<|O5;|  I5;LI5*) 2)N O;|  TO;|C2(LE5;( 5<G  P8U?I1UCN5>( O'$  N5*M #IY89120262
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OBJECT CARD LISTING

CL 1 THROUGH 16

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T+UX/O=|E1F_ 6*P  S1;( 2<GL84?N5_P  E5)R O)PS9%PR&C&  HKU48 -H(OIAI6<B  G SHA"%BGOJSCKZ)  HO|< *SD89120263
T+UY*OHC3O+ ("4X  FK*$3OH OLDZOC&A  HNUZMOHEHI-OAK-)  HMC7" C -MYOC-E  HA5$ROH)HA OAK/'  HAOO 6I889120264
T+UZP KU# /4Z  HC EH.4ZK|¬@ <B  AKT8+ MY?N_X /4Y  %C EHJ4Y?C DZ  +OH)HK-AHN4Z7 |@  D 80489120265
T+UDK&DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &D 6/ 89120266
T+U,(&DA &GU BYU  .S&2ICQU+S& A  1-/MHD -KAA DA8E  C-:A&AAAD5 J;¬'  &E||D@@N D#2|&A  V@@ L:-89120267
T+U%H-M4,OH*BF-D  ,KO¬ /4%H6)$U84C  4@DCMO)PUO)( 2)P  T1)XVK4A(8_.I5'¬  E1DCI1UCS8>$2&(%  NPL- O 089120268
T+U_CH HHOAA((@B  G /DAR46UOH*BFYQ  /L*P3OH&1K-5D@5S  <DZ¬9%BG /DFFU7  ¬OH*BH/L"< A¬9TU  |P=Q R#089120269
T+U_=@Z +C VW M#  &|I/(H%BGL&H1K-5  SOH*BFYQVL-L /OH  SE|" /OHE//_+G@B  G SHM"3 P=Q9C5"  W@Z &D-89120270
T+U>9C¬OIR-E+4C2  ELK, /44BC I+SD#  XOH*BFYD9LYX /OH  E/TE+M<BG SHM"31  AL?G3PHC /438|D  H 3- ;QM89120271
T+U?4&D#1@Z YC I  +SD#DOH*BFYD9LYX  /OHE/TE+M<BG SH  M"3OJL?DOPE"WOH)  <=C--L?G2UB-< U:  HL>4 ODU89120272
T+UO?OH*BFYD9LYX  /OHE/TE+M<BG SH  M"32JL?D1P5"WOH)  <=C6&L?G2 K-< U:  HL?C /OHE-LV+S*B  G /Y O/ 89120273
T+U1D/TE+M<BG SH  M"3OJL?GAT41BOH)  <=C4&L?G M13||E  +1*BG /DA|M#FOH*  BFYQ1LVC /OHSE|@  @-M8 J#&89120274
T+U2V@¬+H <BGL+Y  '-D#10 E<,T32L%P  /OHE-L5+1%BG /D  F<M9&OH*BH/L"OH)  RF G3O+C3S<C3S%&  @-48 :DQ89120275
T+U3-@¬+H1<BGL+Y  '-U#10 E(H333L%P  /OHE-L5+1%BG /D  F<M9&OH*BH/L"OH)  RF G3O+C3S<C3S%&  @/48 P3M89120276
T+U4$@LF<+#3 /43  DC VW M#E|I'(H%B  GL&H<BOQAL>&@XU4  DC AV@U4D|DAV@&O  LJ_V@%BG /,ABWQ  AE &B%89120277
T+U5OOH)T"%BG /D  OOH*BH/& |&AV@@B  A /$ /6QFOH*BH-  <GN8>$E6MCT2<N  1_$L4'$W2)PG&(T  U1;H @EQ89120278
T+U6J8@XO5;I O>/  8%PT8@XN14CT2<N  6*XG2+|M5>.T&<|  O5;.O4@N 8>$I8@|  H&+|O&G7O¬MCI1UA  '5)Q =I 89120279
T+U7<¬O_ 5_V ¬¬E  '&<XF&G7Y1:I'K'X  E8>LM1MCP6)$G&<.  Y&(XE8%PT8@XN14C  HO)|T&<$FK@XS&+|  H1M &B 89120280
T+U8G2OGO&<|H1*|  K&(||1@TT&($N$@L  E5'XE8>I O@TEO'I  6*PS1:( O)PD&(X  E8%PT&<TA4=( 1%$  I8U $9*89120281
T+U988@TE&<V/5UC  C2<PC4UCL2*¬H84C  O1%R76*PS9(LE&(¬  R5%¬RO)J O>/ 1<P  P6*PS8%XN14CS:+.  T1)& RB089120282
T+U9'&(XE8%PTE4C  S8@GR84?R1:.E84C  HO)|T&<GN1DCA&G7  P6)$C&<|H1*|K¬MC  S2($U4@J 5%|C9(V  .&D4 $LQ89120283
T+U:82)PVO)||1DC  X9=))6*PS1:( 2<G  L84CA5*J 8>TS8@P  M&+.H5>LL1DCHO)P  GL*XN9*GL2*J O'$  M5<D @S489120284
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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+U#35*J 8%PQ9<P	NO?N 957IQ;R O?T	K&(|T5)R 2<GN14A	&(PO&(¬C&DA &DC	S2)$S5:.L2)$T2IQ	&& 71489120285
T+U?>L:| /OHE J5	|K*BG /YA.U'7OH*	BF-*,L:. /548C E	|I3="OH)RFH<"OC"	"OH)M"Z? <BG SY	6)Q Q.%89120286
T+U'Z9+('|E QDC	MO)PUO)(S<XC6)$	P6)$G6*GM4'$A1DC	E9').&+.T5_) C*L	D6M_ L¬COQ|GFPMC	I5M 9&?89120287
T+U=U8>|GK4CA1<L	R&||FO%$L5%GD&(L	IO'XO5'XO1'XA5DC	I5MCS8?).&||FO"A	-??$F1UCA8UCR1)/	.&- &8Q89120288
T+U"¬MI. /OHE J/	&U*BGPLT /5 -OH*	BH/LO| A&*¬(Q8 7	"NJIND-8 MGEE??	-L?L3OHC /OHSE|G	30+ N:U89120289
T+V EOH*BH/L2OH*	.:<BG SHM??BG<<7	/OHSE|L /5 -?5T	<N/&*3EQMF?1OEA	5?5S ?5T-C¬'NDVM	K?5- ?.&89120290
T+VAN-<BGL"84BEA	%C E&*NA???5S ?5T	<N/&*&8AMGEEBO4	MGA&$* AMC 1OEA	9C E&*NA?<N/&*&8	AMGD 5.Q89120291
T+VB&O-%[EAOMF7	NA+<N/&)"(Q-<b	G AMM D E BM |	& (& 6)$U84C4?UC	C1MCCO)XD&<|H1*|	K5>& &I<89120292
T+VC.84< """ /OH	E J5&4%BGPLT /5?	9OH)$9?BGDI$ /1B	DOH)&4'XO9+(?|E	2<LB&EA O=I 1+L	M54 RB&89120293
T+VDF9+|I4?XT:C%	H -T /548?5S ?5T	| AKH&?ANX(O*?H	ANODOOE"WL DAP=Q	' EHZ?-DDON5K 'H	A -8 01H89120294
T+VEA NR3O-%' ER	3O E&#32 M*8' NR	2?YF;|DAJ3T4?NX.	2-R<?HEG+|&(O*?H	ASCO&M*8'AER2?YE	'|HO RY889120295
T+VE?M*8'ANR2?YE	2|D1J3T4FNX.2-O*	?.EG+|&)O*?HAPCO	*M*8'BER2?YEJ|HZ	J3T4INX.2-MQ?KVG	+|&Y 3OQ89120296
T+VF7NX.2-L%?HVG	+|&_O*?HA<COEM*8	'CER2?YDV|HVJ3T4	(NX.2-JY?KNG+|&9	O*?HAC3OZM*8'C5R	2?YD QS089120297
T+VG2ACORM*8< EG	DM*88 H.?/ FOH)	NRO 'AER2OHI&:34	HNX. -VC,+ HHC<?	&M¬*'CER2OHI&:34	&NXH JZ<89120298
T+VH_OHI&:34 MSX	2 J" /OHD C3"MSX	/OH; VR3MU3 /OH	; V"WMVX /5DCOH*	BF-QOMVX /5G= <$	I6;H ?-D89120299
T+VIY84CA8=|AO?T	M1)PT&<|H1*|K&<G	T&<GD1(V 9=¬X96_	1<GTOMA=&+¬X9=*	4BE(¬(ELOO4AP=R	M:% # 489120300
T+VHT N(C|+RV=C1	R-C3OH OKEJN<DV	MN3AHNEUOK5"MO-I	KW&OANE_MN*HAM"$	/5J¬O-IKDOOANE_	¬9%H :RH89120301
T+V.; N&/OH)MP3X	"NEX2D '8 J#2D R	: J#2/O(# J# /OH	E-M)LZ%BG /DAH5|	JOH*8FYD,M"3 /OH	E-K% 5-M89120302
T+V<RN8¬ /OH; NJ	PND4?5OP'C EV"5J	(OH*8G-EMOW|'C A	V=O|'OH*8G-EMO6P	#C EL&VL>+¬'MO¬H	&B3O OKD89120303
T+V(MHN(|(VV"¬H	GACO%M4 '(&YC?-D	<COAL&EL%COEL&VL	%OH*BFYH NE<< E(	PNM# /6|=OH*BFZ¬	/OH ?&D89120304
T+V+|H/& O-D <B	G A ?DA &DA &DA	&DA-2OGO&(XE1?X	S8?PRQDA 5)$T1Q_	O%XT&|G2&D7PO)X	I9=- ¬ZY89120305
T+V|HPMCI8UCT2<N	O'$M5=LT1*J 9*G	L9<PB2;(&DC1&DC	2&DC3&DC4&DC5&DC	6&DC7&DC8&DC9&|G	O&|D 8RM8912C306

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CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+V&E?MC;?UC1?=¬	M2;(&|E &+) &+)	&+) &+) &+) &+)	&+) &+) &+) &+)	¬;)'&+¬R1*('1DC	1&D RQ%89120307
T+VJ 94A 94A 94A	94A 94A 94A 94A	94A 94A 94A'975	9'PO&(XE0?PI9*N	O?TEO'I,&<$A2)|	E1D *KO89120308
T+VJ#5_N 8'XY&(P	OK4CX94A(2<PXP&	..........|="| E	MECG NEO8 EJ$?/	F¬| ?Y*I¬|D C-A	MPEY)#<89120309
T+VK6B3QANE8+ EJ	YNFT2-&L /5JX+ E	MO?H&AX30 |HGBP3	1 8 NE1EB3QANE8	8 VJE?/ F¬| ?Y*	I¬|D 8LU89120310
T+VL1 8 NE1EB3S	NE,2D Z??8D??FP	??Y*G¬|D/||EV"C-	ANE32D R???A#?/O(	??J#-/OA&(& *NE<	4BEM E.<89120311
T+VM%QT3ONJ8?4EM	:?Y*<(/NQT3-NJ8	?OEN:(ENPTMANOH	* EN+ AOANN B?5T	-C¬'NDVMKC&ENR 5	S?YD 1J489120312
T+VNXB-?ANOJEB?B	GNJ"3O< OOE"WC&E	¬9VN&OHENM*BGPEM	& C-ENQVNW+O(	NL*HA C /O	3& =J&89120313
T+VOSBER,(EOQ3&	BNW*4AER_(&JO93M	ANW%* ER> (HA L&	ANW%< NR9N>*8-ER	>?/ -C-EO;N$Z+DA	O$?H EK&89120314
T+VP)DA<+ NR9N>U	8HER>?/ FC-EO;N$	Z+ /O$%B&N;H+ NR	9N?&8AER>OAAN8-8	ANXVO'C-BNW# DEP	SC-D $Z<89120315
T+VQQNXVO' OANSA	O)*BG /YABV$=CEV	O5V$POH*BG-IO;NR	'C EP ER9C-EP E*	OH*BG-IP EECC E	OHVQ 5/U89120316
T+VRL#%BG /8? A	O5-?ANSA$9-?ANSI	O? 4ANSIO#< BN/.	/OHE N5O5-8ANXV	O:-8ANSAO?-4ANSA	O)? 4L%89120317
T+VE+AEPOOH*BF/Q	5AA*#0-D <HB C	/O D A	PHEU	&DA &DA &DA	&D PR%89120318
T+V$I&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&D 19M89120319
T+(V* &DA &DA &DA	&DA &D &C" ¬?	B"O|"A"?.".O &	&NY)O5- E D D (L	IO)V &(LBO)U	8B-89120320
T+VU#6)$U84C7&(|	I5WGS5:I 5<(8>|	O6*M4 VX?(/E CM	BO- %AEYGA<HBOR=	4 NW> OE%>HAU?Z	|.-D 2/*89120321
T+VV6QPH5 OE? O/	W,-EY$CO OU68&FL	UEVUC ERP5Y C A	ELNVE,-E/$.--R|H	&B?(Q-|(QOHOAQ6%	8& H 2E-89120322
T+VW1B|H&EC-A -,	2U 6(FUH "HAMQO	E&YC>QAU?Z DOH)	)+.S R|H&DPEQ)H	A D8AQ62? O/?8 D	,&D E2*89120323
T+VX%Q6#2 Z;8 OL	-UC3 /5XAC EELEY	B+O1EK#EQ,E8AQ62	9"6|-UB.-/1F8DFL	2D ,3OHC3O<B% O(	,+ D :L 89120324
T+VYX -,2D +? FX	B & O-H <BG A	& E ND	VH AE< N AN EQ	NOAQ EU O-A$ EO	P& 2A%89120325
T+VZSP-A¬ F 6)$	U84CX94CX9=) 5<X	C6)R 5_) 8?PS818	D:& B_ O(1?-H	H> IU8I ?OH)ROE4	AQ7& 6JQ89120326
T+V?)?-HH> JU8I	?OH)ROE4AQ7$2 -D	8BFL-UC3 /5XA+BA	EL*B&O_F_ O(8?-H	.> EUO1AR6?BGO*F	_ O< NI489120327
T+V,Q;?H8B#-8R<B	&O)? /5X?,&ET¬|H	BB#-DR<B&O)? /5X	A,&ET¬?H8B#-HR<B	&O)? /5XA+DAEL*B	&O2D =.U89120328

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T+V$L,&ET-|HBB#-	AR<B&O)? /5XA,&E	T-?HBB#-BR<B&O)?	/5XA,&ET/|HBB#-	DR<B&O)? /5XA,&E	T/?H 5EM89120329
T+V_+ ->8BFL UEX	$OH)ROLS OU7 UEX	$,&ETS|HBB#-AR<B	&O)? /5XA,&ETS?H	BB#-BR<B&O)? /5X	A,&D KKM89120330
T+V>IQ832 ->8AFL	UEX$OH)ROE4AQ8#	VX$> /UOIAR6@B	GO*D4BE?U(E$8CM	AO=&+ N?UO/D* E>	* AO ;H&89120331
T+V?D E?Q AOBD9Y	COH*BF%H M AO	R¬H C AV@&YCO-E	VDJ4AO9Y @YDG4-D	DOH)$,AOAO@MBC V	W & 2,889120332
T+V?= <E)Q/? /6|	=OH*BFZ$ /OHSE C	/OHDO-D <BG	T&HPG-4 N1OO-E	*'|(QO|HGC3&HPG-	4 NO)HY89120333
T+VO:*<HAP.#3DH	4 NO#<D/*;TAIPGO	OKV1=<D_*-CA<PHH	OLN2D<D9*/TA|PHT	/OHE-&1)(@BG /D	A(VO NA@89120334
T+V15?%HAP|7B V1	9(E*NC&BPE. /OH	; & CS -E'=OG	2-&¬K &| /51DOH*	BFYQ6PK,8 & O-H	< 1R&89120335
T+V2O/O	<G	D1(V ODCO@DCO@MC	O@UCO@4CO*DCO*MC	O*UCO*4CO=DCO=MC	OOM ;E%89120336
T+V3,@<I @<(@<J	@<N @<$A1<LR&FA	@¬A @¬E @¬I @¬(	@¬J @¬N @¬R @¬)	@¬/ @¬V @*E @*I	@*< 9J889120337
T+V4W&|GD&|GE&|G	F1<GTOMA-&+¬X&+¬	X&+¬X&+¬X&+¬X&+¬	X&+¬X&+¬X&+¬X&+¬	X&+¬X&+¬X&+¬X&+¬	X&+*)2Q89120338
T+V5/94CX9=="H1<I	O*$N8@PN8=H4BE5	/(E)P*HAPO|3OHA	1O&A'=OGK &. N5	G@5S @5T O-D <B	G 4 <89120339
T+V6*U/ ZDRHKE/<	ME&N%AE&E4<QEAX	3FX<$8J2MGPD:MJ@	S BHAH-HS 2HDH-M	SASHGH--SBKHHH-%	SCBH @:Y89120340
T+V7PCKH+H-="H	4BE=/(I¬7*HBP1D	4 $=4A<85A 5S_&G	GX CH IO J-GK &H	* N=U |HA T&AP=D	@ FD PCY89120341
T+V8K%C-BP=. DE=	KOH*BG-D(M5=1OH*	BG-D(MV=>OH*BG-I	¬9F TOH*BG-I¬9W	7OH*BG-IO*6A-C V	W OM MAY89120342
T+V9(@ OCR-A-(OO	CR¬1-HOO R¬I¬Q O	R¬DH 3TOQ$¬2U O	< OP=Q$%< FQAQ$%	8C6F7@Z <C EW FF	@C $DM89120343
T+V:HR-E/>8OAJFF	4+|A/>|H&C OAR¬9	/?&O R-E/?L-|O$T	2U O< OQ Q$4< FQ	AQ$48C6F9@Z <C E	W FD O 489120344
T+V@C?OO R-E/?3T	OQ$X2U O< OP=Q$@	< FQAQ$=@HDH< DN	/,:OA%4E8-<T2UAO	<BF HP=Fa(UH@2FP	8C D OHY89120345
T+V@=R¬Z¬@-O R¬_	-H|HG¬@/ 2|H&K&O	QQ Z-QC3SR¬-< WP	@QF 8HER?@Z D|((	V=C-&NW=2U &@2FP	@>8 M9%89120346
T+Va92|H&E#O2&YO	AJFF6C (V=6 TC E	W OPO@Y*6?DRB@Y*	O>BCH@/ D>ACH@Z	&CA/-BWD&?DR8|(J	V=|H @H%89120347
T+V'4/1K8B<T UFA	/C Z-BWD$?C/8|<(	V=.-A2<B&Q*C /OH	E0-A-(1& ON5/W37	OR(L2 & 9 N=S@ZA	¬+| 5YQ89120348
T+V=?O$¬ DE=X+ '	/_@ &F:*8@FF8OAA	¬,3-|Q$T DE=?+|A	/>* &P@*8C6F9OAA	¬_@8GP#@@96QAOH)	¬?30 8ID89120349
T+V=D:FQAOH)¬?33	ZR-G /5="OH)T=%B	G /DOOH*BH/& OH*	BETMDP=TB & O-H	<BG	2<& OH889120350

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T+W VOUCXY6CX94A	&DA &DA &DA &DA	&DA &DA &DA &DA	&FA &<PX5@PC8@P	D&<LA8@E ¬UCX9=¬	X&D 3#U89120351
T+WA-O*|T9<GL&<L	A8@E ¬UCX9=¬XO:|	TO*|H5<PN84CC2<P	C4%|O5;|R5_(8>|	O6*N O*LD6HA=&+¬	X9=* ;2@89120352
T+WB$> LH8I 6CA(	-BWD??DE8|<VV=+B	G(%XN8@PR6;LP84C	P1)PD2)PGO;|TO*|	HK4CS2($U4@J 5)$	T&<H JYM89120353
T+WCO1MCR1*GD:<G	T8@GC2D_ 5)$T&(X	EO*LYO;|TO*|HK4C	I8UCB9+.Y2)PT6M_	8%TO9(|D&<.E&(¬	E5*& 3I-89120354
T+WDJ2)PGE4CI8UC	N5>|A8=|A@@/.&+.	H5>LL1DCB1MCB9+.	Y9(PE9'¬EO=|E1DC	M2*|R5UCP1*J 2<G	L8@< N3089120355
T+WE<9(XA6MCE6)X	O6)LIO)V 2)PC6*P	M1)PT&<PR6)$R9(P	E9'¬EO=|E1DCI5;(	.5)$T&(XD:FGU5*X	T&<< NZ 89120356
T+WFG4_PO84CR1+/	/9(PI84CC4UCO1%$	H1<I 8_PS&<LA8@E	2)PC5_XR1*|TO>.	COMCR1+TN5UCI5;(	5_M 4IH89120357
T+WGB&<GT8@|H&<|	KO>.COMCB9+.Y&<B	G /DBDFAG||'/%<B	GQ/? /5'VS& F	7QB< CX9=TY:;U	FD 6&U89120358
T+WG'_@BAP5*@ FF	7| A/>CO Q$U< WG	/P5# /OHE-- <B	GP6D4BF.U(ES8CM	AQ>&+ O.UO=Q* F.	V AO 9K889120359
T+WH8 FHQ &OIR-E	V@AO R¬HAC AV@&Y	CG AS4-G2/004BF.	U(ES8CO Q>M@&F|	#CBIT=W|#|H'S9%E	EQT4 &Y&89120360
T+WI3+O/S9%E*QUM	# O.WON9SLL%BQ>$	AO6IN+OJS9%E)QV4	#-F.WOH*BG-ES9W|	'C AW O|'|&AS9¬H	ADOO OQY89120361
T+WH> F.XQ>$ /6.	YOH*BFZ. /6./C&A	S9O.W@YE.OH*BF%D	HQ:<M O Q>)S9*B	GQ>T /OHE-&ZT,&O	Q>* =I889120362
T+W.ZQ>$ /6.YOH*	BG-ES9O|'C AV=F|	'OH)T=%BG /DOOH*	BH/& @5S OH*BE?(	Q-<HA C /O	(- 1:M89120363
T+W<UQ7@8BF.X@Z	&C RT9F|HC NT:W|	AOH)T-C-AQ>¬2UA	<DO|?QEU<AO|5Q@G	/6+ + IS9=H&E-O	<Q=Y $SQ89120364
T+W(¬QE&<BW|5Q'<	<AO|#Q@G /6+ + J	S9=H&D O<Q=Z-N O	HQ=NTO*BGQ8 '-F.	X@-D&C /T9W+6C N	T@F< KK489120365
T+W+EO*BGQ8 ' F.	X@-D&C (T8O|PC (	W O|POH)T-<BG	4BF+ROH*BFYDUQ=%	@&F|#CBIT=W|#OH*	<M 4KY89120366
T+W|N9'¬EO=|E1DA	-6*PC1*XV1*J Q($	P&<LEO'$D1MCDO;|	A&<|H1*|K2<LBQ*P	X84CW6*XT1MCDO;|	A5JQ R1<89120367
T+WE&5*N &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &D C&HR<P	/OH; OP2R¬¬ /OH	; OM #8&89120368
T+WJ.@OP5|&AV@=H	AZOQ R(JV9-O(R+J	W *BG /DJOH*BFYD	|R(&< OL?R(-< OL	9R(Y< OJ|R&4< OJ	PRD@ 9Q 89120369
T+WKF|M < ARE-	@Q C&EVC6J|OHE	U$ 8ARD'O6*BGRD$	/OHE-&ZU#@BG /D	ABWL9C VVB6LUOH*	B=YD 3D%89120370
T+WLADWM.|&)V@-H	AC 4IR&_WD=HA1|H	GFL4/R¬G2 JY(BOM	.R/72-&U(BOM.RS¬	2 &T /OHE-M'W)%B	GR-H O1@89120371
T+WL@OH* <PR6)$	R&(|O14CN5U_ 94A	-9=¬X9=¬X9=¬X9=¬	X9=)-&DA 6)$U87#	X94A &<TA4=(=:+/	&D 9H889120372

DATE 07JUL75 25OCT75 15JAN76
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8912 DISPLAY ADAPTER TEST

OBJECT CARD LISTING

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

T+WM7&(|O17#Z:;X  Z:;XZ:;XZR(_U9FB  SRNV-/6NTQD)V$OC  BRP)-%6OAQ+EVS6C  7RRM9ZWO¬C-EVDOD  =R$< M3&89120373

T+WN2QM5V?OE-R*)  /)WPJQP9V66F&R;N  /WWFEO;|T&+.NOUC  R1<XN8'V 5'PD&DC  A8=( 0@TK&DA 0;|  T&<H 1J889120374

T+WO_9+.Y&DCA8=(   5OGR1+/ 2)PT&+.  B&(¬N1<GT84CSOUC  B8>TX94CI5;|R&DA   5_) 1<PC&DA &+L  N1;* 69*89120375

T+WPY54CI5;( 5)V  /9<( &DA &(PRQ;L  C&($F1UCH1<I 8_P  S&(PGO>.COCCR1*G  D:<GCQ(POQ<XN84C  1&D  9JD89120376

T+WQT&DA &DA &D      D      &DA &DA   &DA &<BGR<. /44  78?TO@<$O@|COQ(L  R1¬CO@¬$O1OCM6*P  O@|  1$%89120377

T+WR;1¬G6Q<|A9+|  I5_N QDCI5*|O6)X  EO=( 9<LT&<GN1FG  O6MCHO)XD9%GR1MC  F5_V 5($D1)( @UC  S9(* LA 89120378

TE6R65'$R84CCO)N   O@GU8%N 8@TI8UC  HO)|T                                                  @8-89120379

*            SEC  TION 891  -  SYS  /3 DISPLAY ADAPT  ER TEST                                  89120380

****************  ****************  ****************  ****************  *******                  89120381

* SSW 10 ON PRIN  TS HDB'S IN ROUT  INE 04 AND 05                          *                  89120382

* SSW 12 ON PRIN  TS CONTROL STORA  GE IN ROUTINE 07                        *                  89120383

* SSW 17 ON BYPA  SSES CONTROL STO  RE LOAD FOR A TI  GHT LOOP WHILE       *                  89120384

*           LOOP  ING ROUTINES.                                             *                  89120385

* SSW 1C ON CAUS  ES ROUTINE 24 TO   BE SKIPPED.                            *                  89120386

* MANUAL SELECTI  ON ROUTINES-                                              *                  89120387

*      ROUTINE 4  1 - C.E. MANUAL   MICROPROGRAM                            *                  89120388

*      ROUTINE 4  2 - C.E. TEST BO  X CHECK OUT ROUT  INE                   *                  89120389

*      ROUTINE 4  3 - HDB AND CONT  ROL STORE DUMP U  TILITY                *                  89120390

* WARNING - THIS   SECTION DESTROY  S THE MICROCODE   REQUIRED FOR SYS  TEM  *                  89120391

*           OPER  ATION. RUN SECTI  ON 893 TO RELOAD  .                     *                  89120392

****************  ****************  ****************  ****************  *******                  89120393

E""'*E7*=¬DC"PH$  ="7M&F|   |  C    F%  ASC   R A  SO  Q                09510608730  115761# 89120394
```

LAST PAGE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           2         DECK  4
                           3         SEQ   0
 0000                      4 88930   START 0
                           5         TREP
                           6 ********************************************************************************
                           7 *              32CA UTILITY PROGRAM FOR LOADING MICROPROGRAM                   *
                           8 *------------------------------------------------------------------------------*
                           9 ****** SECTION PREFACE ********************************************************
                          10
                          11         ORG   X'A00'
 0A00                     12         DC    XL2'8930'          SECTION ID
 0A00 8930          0A01  13         DC    XL1'0'             CURRENT ROUTINE NUMBER
 0A02 00            0A02  14         DC    XL1'01'            RESERVED
 0A03 01            0A03  15         DC    XL2'0'             ADDRESS OF FIRST ROUTINE
 0A04 0000          0A05  16         DC    AL2(RTN01)         RESERVED
 0A06 2005          0A07  17         DC    XL2'FFFF'          UDT ENTRY
 0A08 FFFF          0A09  18 UDT1    DC    XL3'890000'
 0A0A 890000        0A0C  19 UDT2    DC    XL3'C11000'
 0A0D C11000        0A0F  20
                          21
                          22
                          23
                          24
                          25
                          26
                          27
                    0058  28 NOTRDY  EQU   X'58'              TIO NOT READY
                    0059  29 INTPND  EQU   X'59'              TIO INT PENDING
                    005D  30 ATTCHK  EQU   X'5D'              TIO ATTCH CHECK
                    005F  31 BUSY    EQU   X'5F'              TIO ATTCH BUSY
                    0048  32 HDB0    EQU   X'48'              LIO/SNS HDB
                    0088  33 HDBCB   EQU   X'88'               SENSE AUX HDB'S
                    0058  34 CPSTOR  EQU   X'58'             LIO/SNS CONTROL STORE
                    0059  35 OPDEC   EQU   X'59'             LIO/SNS OP DECODE
                    0058  36 MSDAR   EQU   X'58'             LIO/SNS MS DATA ADDR REG
                    0058  37 SIOI    EQU   X'58'             SIO IMMEDIATE
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          39 ********************************************************************************
                          40 *                                                                              *
                          41 *              USES DA LIO INSTRUCTION TO LOAD CORE WITH OBJECT                *
                          42 *              PROGRAM AT ADDRESS 0 IN DA ATTACHMENT CONTROL STORE             *
                          43 *              OBJECT PROGRAM INPUT FROM CARDS OR DISK                         *
                          44 *              AT END OF LOADING A DUMP IS DONE FOR VERIFICATION.              *
                          45 *                                                                              *
                          46 ********************************************************************************
                          47
                          48 ********************************************************************************
                          49 *              ROUTINE 1 - MICROPROGRAM LOADER                                 *
                          50 ********************************************************************************
                          51 *                                                                              *
                          52 ********************************************************************************
                          53
                          54         ORG   X'2000'
                          55 *             THIS PROGRAM MUST BEGIN AT LOCATION X'2000' SO THAT
                          56 *             DCP MAY LINK AND BE RETURNED TO FROM THIS PROGRAM
                          57 *             BEFORE THE 'HA' HALT IS GIVEN WHICH SIGNIFIES THAT
                          58 *             DCP HAS LOADED SUCCESSFULLY.
                          59 *        THE FOLLOWING FIVE BYTES ARE A COMMUNICATIONS AREA USED TO
                          60 *        INFORM PGM FC1 OF THE MICRO-MAP LOCATION AND THE DECK ID.
                          61 *        DO NOT CHANGE THE LOCATION OF THESE BYTES
                          62
 2000 2868          2001  63 AMICRO  DC    AL2(TABLE+255)     STARTING ADDR OF MICRO-CODE FOR FC1
 2002 C6C3F7        2004  64 XKFC7   DC    CL3'FC7'           DATA DECK ID TO BE USED
                          65
                          66 *       ROUTINE PREFACE
                          67
 2005 01            2005  68 RTN01   DC    XL1'01'
 2006 00            2006  69         DC    XL1'00'            ROUTINE 1
 2007 FFFF          2008  70 XFFFF   DC    XL2'FFFF'          LAST ROUTINE
                          71
                          72 ********************************************************************************
                          73 *   FIRST READ MICROCODE CARD IMAGES AND COVERT FROM 4 BYTES TO 3               *
                          74 *   BYTES                                                                      *
                          75 ********************************************************************************
 2009 3C 20 2129          76         MVI   QUICK-2,X'20'
 200D 0D 01 3C5A 2642     77         CLC   BLOD+3(2),LINKA
 2013 C0 01 3C41          78         BNE   LINKK              WAS A SYSTEM RESET PERFORMED
                    2017  79 START   EQU   *                  WHILE DCP WAS IPLING?
 2017 3D FF 3CDC          80         CLI   SWITCH,X'FF'       *
 201B F2 81 34            81         JE    BYPASS             FIRST PASS?
 201E 3C FF 3CDC          82         MVI   SWITCH,X'FF'
 2022 38 01 020D          83         TBN   SBYTE5,SSW2F       BYPASS AFTER FIRST PASS
 2026 3B 01 020D          84         SBF   SBYTE5,SSW2F       SHOULD THE RETURN BE TO DCP?
 202A F2 90 10            85         JF    NORM
 202D 0C 01 3C5A 1FF5     86         MVC   BLOD+3(2),X'1FF5'  NO--SECTION WAS LOADED NORMALLY
 2033 0C 01 2128 1FEF     87         MVC   QUICK(2),X'1FEF'   USE THE ADDRESS AT 1FF5 AS THE
 2039 3C 30 2129          88         MVI   QUICK-2,X'30'      USE ADDRESS TO LOAD MICRO FROM
                          89 *
                          90 *       NOTE THAT IF THE IPL HAS BEEN DONE FROM THE 3340,
                          91 *       THE 'B   LOAD' WILL HAVE AS ITS PARAMETER
                          92 *       AN ADDRESS POINTING TO THE CCHHR REQUIRED FOR THE
                          93 *       DIRECT LOAD OF THE FCX DECK.  THIS ADDRESS IS
                          94 *       PICKED UP AT '1FEF - 1FFF' (SETUP BY DCP)
                          95 *                                   RETURN POINT TO DCP
 203D C0 87 021A          96 NORM    B     PRINT
                    2041  97         DC    XL1'06'            PRINT ONLY ON FIRST PASS
 2041 06                  98         DC    IL1'28'
 2042 1C                  99         DC    AL2(MSGLD)
 2043 395F               100         TBF   SBYTE0,SSW00+SSW01 BYPASS HALT IS LOOPING
 2045 39 C0 0208         101         JF    BYPASS
 2049 F2 90 06           102         B     HALT
 204C C0 87 0222         103         DC    XL2'89A3'          HALT * A3********************
                    2051 104                                  IF SSW04 IS ON
 2050 89A3               105
                    2052 106 BYPASS  EQU   *
 2052 3C 00 3888          107        MVI   MICOD,X'00'        CLEAR BUFFER FOR MICROCODE
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 2056 0C 27 3887 3888          107        MVC   MICOD-1,MICOD(40)      THIS CLEAR CLEARS THE BUFFER
 205C C2 01 3867               108        LA    MICOD2-1,XR1           OF MICORDE REGION AND ONE BYTE
 2060 3C 10 2114               109        MVI   COUND,16               RIGHT BEFORE THE MICROCODE OR
 2064 5C FF 00 01              110 CLEAR  MVC   0(256,XR1),1(,XR1)      THE LAST BYTE OF THE UNUSED
 2068 36 01 2118               111        A     NG256,XR1              REGION
 206C 0F 00 2114 2113          112        SLC   COUND,ONO
 2072 C0 01 2064               113        BNZ   CLEAR
 2076 C0 87 0212               114 ACT2   B     TEST
 207A 38 80 020A               115        TBN   SBYTE2,SSW10           SENSE SWITCH 10 IS NOT ON
 207E F2 10 07                 116        JT    MSGG
 2081 3C 02 2640               117        MVI   TERP,X'02'             THEN OPTION 2 IS USED
 2085 F2 87 32                 118        J     SETU1
 2088 C0 87 021A               119 MSGG   B     PRINT                  OPERATOR PRINT
 208C 03               208C    120        DC    XL1'03'
 208D 22               208D    121        DC    IL1'34'
 208E 38FC             208F    122        DC    AL2(OPR1)
                               123
 2090 C0 87 021A               124        B     PRINT                  OPERATOR PRINT
 2094 02               2094    125        DC    XL1'02'
 2095 47               2095    126        DC    IL1'71'
 2096 3943             2097    127        DC    AL2(OPR2)
                               128
 2098 C0 87 021A               129        B     PRINT                  OPERATOR PRINT
 209C 01               209C    130        DC    XL1'01'
 209D 35               209D    131        DC    IL1'53'
 209E 3994             209F    132        DC    AL2(OPR3)
                               133
 20A0 C0 87 021A               134        B     PRINT                  OPERATOR PRINT
 20A4 01               20A4    135        DC    XL1'01'
 20A5 26               20A5    136        DC    IL1'38'
 20A6 39BA             20A7    137        DC    AL2(OPR4)
                               138
 20A8 C0 87 021A               139        B     PRINT                  OPERATOR PRINT
 20AC 07               20AC    140        DC    XL1'07'
 20AD 27               20AD    141        DC    IL1'39'
 20AE 39E1             20AF    142        DC    AL2(OPR5)
                               143
 20B0 C0 87 0222               144        B     HALT
 20B4 89F0             20B5    145        DC    XL2'89F0'              F0 HALT
                               146        SNS   TERP,X'00'             SENSE DATA SWITCHES
                       20BA    147 SETU1  EQU   *
                               148        CLI   UTAB,X'F0'             SHOULD MFCU BE USED AS THE LOADER?
                               149        JE    PFFX
                               150        CLI   UTAB,X'51'             SHOULD 1442 BE USED AS THE LOADER?
                               151        JE    PFFX
                               152        CLI   UTAB,X'F2'             SHOULD 2560 BE USED AS THE LOADER?
                               153        JNE   DICKL
                               154
                               155 PFFX   B     PRINT                  OPERATOR PRINT
                       20D3    156        DC    XL1'07'                TO SURE THE DECK FC7 IS IN THE PRI
                       20D4    157        DC    IL1'87'                HOPPER
                       20D6    158        DC    AL2(OPR6)
                               159        B     HALT
 20BC 89F1             20DC    160        DC    XL2'89F1'              HALT TO CHECK PROGRAM IN HOPPER
 20DD F2 87 3D                 161        J     SETUP
                       20E0    162 DICKL  EQU   *
 20E0 38 80 0233               163        TBN   UTAB+1,X'80'           CHECK FOR DIRECT ACCESS DEVICE
 20E4 F2 10 36                 164        JT    SETUP
 20E7 C2 01 0232               165        LA    UTAB,XR1
 20EB 7D A0 00                 166        CLI   0(,XR1),X'A0'          IS IT A 5444?
 20EE F2 81 2C                 167        JE    SETUP
                               168
 20F1 C0 87 021A               169        B     PRINT                  ERROR PRINT
 20F5 C6               20F5    170        DC    XL1'C6'
 20F6 38               20F6    171        DC    IL1'56'
 20F7 2686             20F8    172        DC    AL2(ERR6)
 20F9 1502             20FA    173        DC    XL2'1502'
 20FB C0 87 3C41               174        B     LINKK
```



```
 ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                       20FF    175        USING STAT,XR1
                       20FF    176        USING STAT,XR2
                       20FF    177 STAT   EQU   *
                               178 ********************************************************************************
                               179 *      CONSTANT                                                                *
                               180 *                                                                              *
                               181 ********************************************************************************
 20FF 2769             2100    182 BUFAD  DC    AL2(TABLE)
 2101 FFFF             2102    183 NEG1   DC    XL2'FFFF'
 2103 FFFD             2104    184 NEG3   DC    XL2'FFFD'
 2105 0200             2106    185 D255   DC    IL2'512'
 2107 0100             2108    186 D256   DC    IL2'256'
 2109 3888             210A    187 BUFEC  DC    AL2(MICOD)
 210B 0000             210C    188 WORK   DC    XL2'0'
 210D 0000             210E    189 LPTR   DC    XL2'0'
 210F F0F0F0F1         2112    190 ONDE   DC    DL4'1'
 2113 01               2113    191 ONO    DC    IL1'1'
 2114 08               2114    192 COUND  DC    IL1'8'
 2115 2788             2116    193 OP32   DC    AL2(OPREG)
 2117 FF00             2118    194 NG256  DC    IL2'-256'
 2119 40404040         211C    195 SEQ    DC    4CL1' '
                       211D    196 SETUP  EQU   *
 211D C2 02 20FF               197 CLFLAG LA    STAT,XR2
 2121 C2 01 20FF               198        LA    STAT,XR1
 2125 C0 87 022A               199        B     LOAD                   LOAD FC7 FIRST CARD
 2129 20               2129    200        DC    XL1'20'
 212A DFC7             2128    201 QUICK  DC    XL2'DFC7'
 212C 0C 00 3AA9 08D8          202        MVC   LEVEL(1),INPUT+91      SAVE THE MICRO LEVEL
 2132 F2 87 11                 203        J     COMM
                       2135    204 LOADC  EQU   *                     LOAD NEXT CARD
 2135 C0 87 022A               205        B     LOAD
 2139 10               2139    206        DC    XL1'10'
 213A C2 01 0880               207        LA    INPUT,XR1
 213E 4D 03 5F 211C            208        CLC   95(4,XR1),SEQ          COMPARE CARD SEQUENCE
 2143 F2 01 A7                 209        JNE   CHKSEQ
                       2146    210 COMM   EQU   *
 2146 C2 01 0880               211        LA    INPUT,XR1
                       214A    212 NREP   EQU   *
                               213
 214A 4D 02 5A 2004            214        CLC   9C(3,XR1),XKFC7        CHECK CARD ID
 214F F2 01 C3                 215        JNE   CHKFCB                 ID DOES NOT MATCH
 2152 1C 03 211C 5F            216        MVC   SEQ,95(4,XR1)          STORE PRESENT SEQ
 2157 06 03 211C 2112          217        AZ    SEQ(4),ONDE(4)         ADD SEQ BY 1
 215D 7D C5 00                 218        CLI   0(,XR1),C'E'           CHECK IT IS A END CARD
 2160 F2 81 C6                 219        JE    CARDIN                 ALL DATA CARD ARE IN
 2163 7D E3 00                 220        CLI   0(,XR1),C'T'           CHECK IT IS A TEXT CARD
 2166 C0 01 2135               221        BNE   LOADC                  NOT T CARD THEN GO TO NEXT CARD
 216A 7D D0 01                 222 LOOP2  CLI   1(,XR1),X'D0'          REPLACE X'D0' BY X'2A'
 216D F2 01 03                 223        JNE   *+6
 2170 7C 2A 01                 224        MVI   1(,XR1),X'2A'
 2173 D2 01 01                 225        LA    1(,XR1),XR1
 2176 34 01 210C               226        ST    WORK,XR1
 217A 3D D8 210C               227        CLI   WORK,X'D8'
 217E C0 04 216A               228        BNH   LOOP2
 2182 C2 01 08D8               229        LA    INPUT+88,XR1
 2186 C2 02 08D8               230        LA    INPUT+88,XR2
 218A 3C 00 2195               231 LENGTH MVI   S1+1,0                 INITIALIZE POINTERS
 218E 0C 00 2199 2195          232 CMLOOP MVC   S2+1(1),S1+1            TO THE CARD
 2194 AE 00 00 00              233 S1     ALC   0(*-*,XR2),0(,XR2)      SET COUNTER
 2198 AE 00 00 00              234 S2     ALC   0(*-*,XR2),0(,XR2)      SHIFT OFF HIGH ORDER TWO BITS
 219C 0E 00 2195 3D8E          235        ALC   S1+1(1),ONET            ADD BYTE TO ITSELF
 21A2 3D 04 2195               236        CLI   S1+1,4
 21A6 C0 82 218E               237        BL    CMLOOP                 INCRESE COUNTER BY 1
 21AA 36 02 2102               238        A     NEG1,XR2                COUNTER IS 4 THEN DONE
 21AE 6C 02 00 00              239        MVC   0(3,XR1),0(,XR2)
 2182 36 01 2104               240        A     NEG3,XR1
 2186 36 02 2104               241        A     NEG3,XR2
 218A 34 01 210C               242        ST    WORK,XR1
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   21BE 3D 96 210C            243         CLI   WORK,X'96'
   21C2 C0 84 218A            244         BH    LENGTH
   21C6 C2 01 0880            245 TEDONE  LA    INPUT,XR1
   21CA 4E 01 19 2100         246         ALC   25(2,XR1),BUFAD
                              247 *
   21CF 4D 01 19 210A         248         CLC   25(2,XR1),BUFED
                              249 *
   21D4 F2 84 2A              250         JH    CHKEND
                              251 *
   21D7 1C 02 21E7 19         252         MVC   MOVE+3(3),25(,XR1)
   21DC 1C 00 21E8 17         253         MVC   MOVE+4(1),23(,XR1)
   21E1 D2 01 1A              254         LA    26(,XR1),XR1
                              255 *
   21E4 1C 00 0000 00         256 MOVE    MVC   *-*(*-*),*-*(,XR1)
   21E9 C0 87 2135            257         B     LOADC
                        21ED  258 CHKSEQ  EQU   *
   21ED C0 87 021A            259         B     PRINT
   21F1 C6              21F1  260         DC    XL1'C6'
   21F2 31              21F2  261         DC    IL1'49'
   21F3 26B7            21F4  262         DC    AL2(ERR7)
   21F5 15F2            21F6  263         DC    XL2'15F2'
   21F7 C0 87 0222            264         B     HALT
   21FB 89F2            21FC  265         DC    XL2'89F2'
   21FD C0 87 2017            266         B     START
                        2201  267 CHKEND  EQU   *
   2201 C0 87 021A            268         B     PRINT
   2205 C6              2205  269         DC    XL1'C6'
   2206 31              2206  270         DC    IL1'49'
   2207 2768            2208  271         DC    AL2(ERRF)
   2209 89F3            220A  272         DC    XL2'89F3'
   220B C0 87 0222            273         B     HALT
   220F 89F3            2210  274         DC    XL2'89F3'
   2211 C0 87 2017            275         B     START
                        2215  276 CHKFCB  EQU   *
   2215 C0 87 021A            277         B     PRINT
   2219 C6              2219  278         DC    XL1'C6'
   221A 31              221A  279         DC    IL1'49'
   221B 26E8            221C  280         DC    AL2(ERR8)
   221D 89F4            221E  281         DC    XL2'89F4'
   221F C0 87 0222            282         B     HALT
   2223 89F4            2224  283         DC    XL2'89F4'
   2225 C0 87 2017            284         B     START
                        2229  285 CARDIN  EQU   *
                        2608  286         USING ENDADD,XR2
   2229 C2 02 2608            287         LA    ENDADD,XR2
   222D 3D 03 2640            288         CLI   TERP,X'03'
                              289 *
   2231 C0 81 23FE            290         BE    SENSE
                              291
   2235 3D FF 7000            292         CLI   PATCH,X'FF'
   2239 C0 81 22E9            293         BE    ENDADT
   223D C0 87 021A            294         B     PRINT
   2241 02              2241  295         DC    XL1'02'
   2242 20              2242  296         DC    IL1'32'
   2243 4E18            2244  297         DC    AL2(PATCHX)
   2245 C0 87 021A            298         B     PRINT
   2249 01              2249  299         DC    XL1'01'
   224A 09              224A  300         DC    IL1'9'
   224B 4E21            224C  301         DC    AL2(PATCHH)
   224D C2 01 6FFE            302         LA    PATCH-2,XR1
   2251 D2 01 02              303 INCTOA  LA    2(,XR1),XR1
   2254 1C 01 263E 01         304         MVC   TEMP,1(2,XR1)
   2259 1C 01 210C 01         305         MVC   WORK,1(2,XR1)
                              306
   225E 0E 01 263E 263E       307         ALC   TEMP(2),TEMP
   2264 C2 02 286A            308         LA    UNUSD+2,XR2
   2268 36 02 263E            309         A     TEMP,XR2
                              310
```

LOAD CARD IMAGE POINTER
ADD BUFFER LOCATION TO
END ADDRESS OF CARD CODE
COMPARE BUFFER LENGTH TO
CARD CODE CORE REQUIREMENT
IF BUFFER IS NOT BIG ENOUGH
ERROR
INDICATE CARD ADDRESS IN CORE
INDICATE LENGTH OF CODE
INDICATE START ADDRESS OF
CODE ON THE CARD
MOVE CODE TO BUFFER
BRANCH TO READ NEXT CARD
SEQUENCE CHECK

CODE LENGTH CHECK

DECK ID CHECK

ALL CARD ARE READ IN
BUFFER

SEE IF OPTION 3 SELECTED (SENSE
AND DUMP MC CORE)

ANY PATCHING TO BE DONE?
BRANCH IF NOT
PRINT HEADING FOR PATCH

PRINT HEADING

POINT XR1 AHEAD OF PATCH
POINT XR1 TO ADDRESS
GET PATCH ADDRESS
SAVE PATCH ADDR IN WORK SPACE

CONVERT ADDR TO BYTE DISPLACEMENT
POINT XR2 TO MICRO MAP
ADD DISPLACEMENT


```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   226C D2 01 01 02           311 NEXDAT LA    2(,XR1),XR1
   226F 4D 01 01 3D8C         312        CLC   1(2,XR1),ALL0
   2274 C0 81 2251            313        BE    INCTOA
   2278 4D 01 01 2008         314        CLC   1(2,XR1),XFFFF
   227D F2 81 5A              315        JE    EPATCH
   2280 39 F8 210B            316 NOTSRT TBF   WORK-1,X'F8'
   2284 F2 90 3F              317        JF    PATCHF
   2287 1C 01 263E 01         318        MVC   TEMP,1(2,XR1)
   228C 9C 01 00 01           319        MVC   0(2,XR2),1(,XR1)
   2290 C0 87 021E            320        B     UNPACK
   2294 02              2294  321        DC    IL1'2'
   2295 210C            2296  322        DC    AL2(WORK)
   2297 4E25            2298  323        DC    AL2(PPATCH-5)
   2299 0E 01 210C 3D8E       324        ALC   WORK(2),ONET
   229F 0D 01 278A 210C       325        CLC   NINST(2)-WORK
   22A5 F2 84 06              326        JH    NUMIOK
   22A8 0C 01 278A 210C       327        MVC   NINST(2),WORK
                              328
   22AE C0 87 021E            329 NUMIOK B     UNPACK
   22B2 02              22B2  330        DC    IL1'2'
   22B3 263E            22B4  331        DC    AL2(TEMP)
   22B5 4E2A            22B6  332        DC    AL2(PPATCH)
                              333
   22B7 C0 87 021A            334        B     PRINT
   22B8 01              22B8  335        DC    XL1'01'
   22BC 09              22BC  336        DC    IL1'9'
   22BD 4E2A            22BE  337        DC    AL2(PPATCH)
                              338
   22BF E2 02 02              339        LA    2(,XR2),XR2
   22C2 C0 87 226C            340        B     NEXDAT
                              341
   22C6 C0 87 021A            342 PATCHE B     PRINT
   22CA C7              22CA  343        DC    XL1'C7'
   22CB 12              22CB  344        DC    IL1'18'
   22CC 4DF8            22CD  345        DC    AL2(FORME)
   22CE 89EC            22CF  346        DC    XL2'89EC'
   22D0 C0 87 0222            347        B     HALT
   22D4 89EC            22D5  348        DC    XL2'89EC'
   22D6 C0 87 3C41            349        B     LINKK
                              350
   22DA C0 87 3D15            351 EPATCH B     GENSUM
   22DE 0C 03 27BE 3D85       352        MVC   CHKSUM(4),PAR+3
   22E4 C0 87 021A            353        B     PRINT
   22E8 16              22E8  354        DC    XL1'16'
                              355 ********************************************************************
                              356 *  CHECK NUMBER OF INSTRUCTIONS OF MICRO-CODE WITH THE AVAILABLE CORE *
                              357 ********************************************************************
                        22E9  358 ENDADT EQU   *
   22E9 0C 01 264C 264E       359        MVC   ENTT,ADMICD
   22EF 0E 01 264C 2106       360        ALC   ENTT,D255(2)
   22F5 0C 01 210C 2644       361        MVC   WORK(2),X0100
   22FB 0D 01 278A 210C       362 LOOP   CLC   NINST(2),WORK
   2301 F2 04 3F              363        JNH   ACT
   2304 0E 01 264C 2106       364        ALC   ENTT,D255(2)
   230A 0E 01 210C 2644       365        ALC   WORK(2),X0100
   2310 3D 09 210B            366        CLI   WORK-1,X'09'
   2314 C0 82 22FB            367        BL    LOOP
                        2318  368 NOCORE EQU   *
   2318 0C 01 233E 264C       369        MVC   ENTAB(2),ENTT
   231E C0 87 021A            370        B     PRINT
   2322 C6              2322  371        DC    XL1'C6'
   2323 4F              2323  372        DC    IL1'79'
   2324 2737            2325  373        DC    AL2(ERR9)
   2326 89E1            2327  374        DC    XL2'89E1'
   2328 C0 87 0222            375        B     HALT
   232C 89E1            232D  376        DC    XL2'89E1'
   232E 80 00 38              377        SNS   TERP(,XR2),X'00'
   2331 8D 04 38              378        CLI   TERP(,XR2),X'04'
```

INCREMENT XR1 TO DATA
IS DATA ALL 0000 (DELINITER)
IF SO GO TO NEXT ADDRESS
IS DATA = FFFF (END OF PATCH)
JUMP OUT IF SO
HI 5 BITS MUST BE ZERO
ERROR IF NOT
MOVE DATA FOR UNPACKING
MOVE DATA TO MICRO MAP
UNPACK ADDRESS FOR PRINTING

ADD 1 TO ADDRESS IN WORK
IS IT HIGHER THAN NUM INSTRUCTIONS
JUMP IF NOT
INCREASE NUM OF INSTRUCTIONS

UNPACK THE DATA FOR PRINTING

PRINT ADDR AND DATA

POINT XR2 TO NEXT WORD IN MAP
GO GET NEXT DATA

PRINT FORMAT ERROR

GO END

GO GENERATE A CHECK SUM
MOVE IT INTO MICRO MAP
SPACE 6

SAVE START ADDRESS OF CODE
IN BUFFER
ADD 256 BYTES
INITIALIZE WORK TO 256
TEST FOR END

INCREASE ADDRESS COUNT BY 1 BNT
ADD 256 TO WORK
TEST FOR ENOUGH CORE
OKAY UNTIL WE REACH 9
CORE IN NOT AVAILABLE
MOVE END CODE ADDRESS TO DUMP

PRINT NO CORE MESSAGE

E1 HALT
SENSE DATA SWITCHES
SEE IF OPTION 4 SELECTED DUMP

8930 FC7 MICRO-CODE LOADER PROGRAM

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2334 F2 01 08                379         JNE   OUTGO
   2337 C0 87 3B79              380         B     DUMP
   233B 2769              233C  381         DC    AL2(TABLE)
   233D 0000              233E  382 ENTAB   DC    XL2'0000'
                          233F  383 OUTGO   EQU   *
   233F C0 87 3C41              384         B     LINKK
                          2343  385 ACT     EQU   *
   2343 C2 01 277A              386         LA    ECSFX+2,XR1          LOAD ADDRESS OF OP-CODE TABLE
   2347 C2 02 2608              387         LA    ENDADD,XR2
                                388
   234B F3 58 80                389         SIO   X'80',SIOI           DISABLE
                                390
   234E 71 59 00                391 LOOPOP LIO    0(,XR1),OPDEC        LOAD OP-CODE
   2351 B4 01 36                392         ST    TEMP(,XR2),XR1       STORE XR1
   2354 D2 01 02                393         LA    2(,XR1),XR1          BUMP ADDRESS
   2357 8D 01 36 2116           394         CLC   TEMP(,XR2),OP32(2)   END OF OP CODE          ?
   235C C0 82 234E              395         BL    LOOPOP               *
                                396 *
                                397 *       INITIALIZE HDB'S TO ZERO
                                398 *
   2360 0C 01 3CE8 3CE2         399         MVC   WORK2(2),COUNT1      SETUP
   2366 3C 00 3CEB              400         MVI   SECSW,X'00'           FOR 1ST
   236A 3C 48 2373              401 DO2     MVI   LIO1+1,HDB0            PASS
   236E 3C 48 3CA4              402         MVI   SNS1+1,HDB0
   2372 31 48 3CD7              403 LIO1    LIO   DZERO,HDB0
   2376 C1 5D 262B              404         TIO   ADCHK,ATTCHK         ATTACHMENT CHECK?
   237A C0 87 3C9F              405         B     SNSDEC               CHECK FOR ZERO IN BOTH BUFFERS
   237E 0E 00 2373 3C1C         406         ALC   LIO1+1(1),ONED
   2384 3D 50 2373              407         CLI   LIO1+1,X'50'         CHECK FOR
   2388 C0 01 2372              408         BNE   LIO1                  END OF LIST
   238C 3D FF 3CEB              409         CLI   SECSW,X'FF'          HAS SECOND PASS BEEN COMPLETED?
   2390 F2 81 14                410         JE    DDONE
   2393 3C FF 3CEB              411         MVI   SECSW,X'FF'
   2397 F3 58 80                412         SIO   X'80',SIOI           DISABLE
   239A F3 58 C0                413         SIO   X'C0',SIOI           ENABLE
   239D 0C 01 3CE8 3CE0         414         MVC   WORK2(2),COUNT2
   23A3 C0 87 236A              415         B     DO2
                          23A7  416 DDONE   EQU   *                    COMPLETE LOADING HDB'S
   23A7 F3 58 80                417         SIO   X'80',SIOI           DISABLE
   23AA 31 8C 3CD7              418         LIO   DZERO,X'8C'           FORCE CAR = 0000
   23AE 0C 01 3CE8 3CE4         419         MVC   WORK2(2),COUNT3
   23B4 3C 88 3CA4              420 EMUL    MVI   SNS1+1,HDB08          SET UP TO SENSE AUX HDB'S
   23B8 C0 87 3C9F              421 AGAIN   B     SNSDEC                 SENSE HDB'S
   23BC 3D 90 3CA4              422         CLI   SNS1+1,X'90'           DONE YET?
   23C0 C0 01 23B8              423         BNE   AGAIN                  LOOP IF NOT
   23C4 3D 00 3CEB              424         CLI   SECSW,0                SECOND PASS?
   23C8 F2 81 14                425         JE    PATCHR                 DONE IF SO
   23CB 3C 00 3CEB              426         MVI   SECSW,0                SET FOR SECOND PASS
   23CF 0C 01 3CE8 3CE6         427         MVC   WORK2(2),COUNT4
   23D5 F3 58 80                428         SIO   X'80',SIOI           DISABLE
   23D8 F3 58 C0                429         SIO   X'C0',SIOI           ENABLE
   23DB C0 87 23B4              430         B     EMUL                 GO DO SECOND PASS
                                431
   23DF F3 58 80                432 PATCHR SIO    X'80',SIOI           DISABLE
   23E2 F3 58 C0                433         SIO   X'C0',SIOI           ENABLE
                                434
   23E5 C2 01 286A              435 LOAT    LA    UNUSD+2,XR1          LOAD BEGINNING
                                436 *                                  ADDRESS OF PROGRAM
   23E9 71 58 00                437 LOOP1   LIO   0(,XR1),CPSTOR       LOAD CONTROL STORAGE
   23EC C1 5D 262B              438         TIO   ADCHK,ATTCHK         CHECK FOR ATTACHMENT CHECK
   23F0 B4 01 36                439         ST    TEMP(,XR2),XR1       STORE XR1
   23F3 D2 01 02                440         LA    2(,XR1),XR1          BUMP ADDRESS
   23F6 AD 01 36 44             441         CLC   TEMP(,XR2),ENTT(2,XR2)  END OF BMT          ?
   23FA C0 82 23E9              442         BL    LOOP1                RELOOP
                                443
   23FE 3C 00 4DBC              444 SENSE   MVI   ENMLT+39,X'00'           CLEAR BUFFER FOR MICROCODE
   2402 0C 27 4DBB 4D3C         445         MVC   ENMLT+38,ENMLT+39(40)
   2408 C2 01 4D94              446         LA    ENMLT-1,XR1
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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   240C 3C 10 2114              447         MVI   COUND,16
   2410 5C FF 00 01             448 CLEAN   MVC   0(256,XR1),1(,XR1)
   2414 36 01 2118              449         A     NG256,XR1
   2418 0F 00 2114 2113         450         SLC   COUND,ONO
   241E C0 01 2410              451         BNZ   CLEAN
   2422 0C 01 3D88 278A         452         MVC   MCSC(2),NINST
   2428 0C 01 264C 3D88         453         MVC   ENTT(2),MCSC
   242E F3 58 80                454         SIO   X'80',SIOI           DISABLE
   2431 F3 58 C0                455         SIO   X'C0',SIOI           ENABLE
                                456
   2434 C2 02 3D96              457         LA    MLTAC+1,XR2
   2438 B0 58 00                458 GETC    SNS   0(,XR2),CPSTOR       SNS BACK
   243B C1 5D 262B              459         TIO   ADCHK,ATTCHK         ATTACHMENT CHECK?
   243F 0F 01 3D88 3D8E         460         SLC   MCSC(2),ONET
   2445 C0 81 2450              461         BZ    COMPP
   2449 E2 02 02                462         LA    2(,XR2),XR2
   244C C0 87 2438              463         B     GETC
                          2450  464 COMPP   EQU   *
   2450 F3 58 80                465         SIO   X'80',SIOI           DISABLE
   2453 3D 03 2640              466         CLI   TERP,X'03'
   2457 C0 81 2473              467         BE    SNSPRT
   245B C0 87 3D1C              468         B     SUMCHK               GO TEST THE CHECK SUM
                                469
   245F 0D 03 3D85 27BE         470         CLC   PAR+3(4),CHKSUM
   2465 C0 81 25E8              471         BE    PRINTQ
   2469 C0 87 021A              472 ERRLOD B      PRINT                ERROR PRINT
   246D C7                2460  473         DC    XL1'C7'
   246E 11                2466  474         DC    IL1'17'
   246F 38C9              2470  475         DC    AL2(MCSLOD)          MCS LOADING ERROR
   2471 8901              2472  476         DC    XL2'8901'
                                477
   2473 C1 01 3D95              478 SNSPRT LA     MLTAC,XR1            PRINT PROGRAM  OF SENSED CODE
   2477 34 01 3C18              479         SA    SB,XR1               START ADDRESS
   247B 34 01 3C1A              480         ST    EB,XR1
   247F 0F 01 3C1A 3C1C         481         SLC   EB,ONED(2)
   2485 0E 01 3C1A 27BA         482         ALC   EB,NINST(2)          ENDING ADDRESS
   2488 0E 01 3C1A 27BA         483         ALC   EB,NINST(2)          PRINT PROGRAM
   2491 0C 01 3CDB 3CD7         484         MVC   ADD,DZERO(2)
   2497 C2 01 2869              485         LA    UNUSD+1,XR1          PRINT PROGRAM  OF READ IN CODE
   2498 34 01 3C14              486         ST    SA,XR1               START ADDRESS
   249F 34 01 3C16              487         ST    EA,XR1
   24A3 0F 01 3C16 3C1C         488         SLC   EA,ONED(2)
   24A9 0E 01 3C16 27BA         489         ALC   EA,NINST(2)          ENDING ADDRESS
   24AF 0E 01 3C16 27BA         490         ALC   EA,NINST(2)          PRINT PROGRAM
   24B5 C0 87 021A              491         B     PRINT                PRINT HEADING
   24B9 02                2489  492         DC    XL1'02'
   24BA 58                248A  493         DC    IL1'88'
   24BB 3B1D              248C  494         DC    AL2(OPRT)
   24BD 0C 01 3C20 3C16         495 XOOPD  MVC    TEM,EA(2)
   24C3 0F 01 3C20 3C14         496         SLC   TEM,SA(2)            LENGTH COUNT
   24C9 0C 57 3B75 3B76         497         MVC   BUF,BUF+1(38)        CLEAR BUFFER
   24CF C0 87 021E              498         B     UNPACK
   24D3 02                24D3  499         DC    IL1'2'
   24D4 3CDB              24D5  500         DC    AL2(ADD)
   24D6 3B22              24D7  501         DC    AL2(BUF-83)
   24D8 0E 01 3CDB 3CD9         502         ALC   ADD,X0010(2)
   24DE 0D 01 3C20 3C1E         503         CLC   TEM,D000F(2)         16 CHARACTERS
   24E4 F2 84 82                504         JH    XVER16
   24E7 0C 00 2550 3C20         505         MVC   XCUNT,TEM(1)         LENGTH OF CHAR -1
   24ED 0C 01 2552 3C16         506         MVC   XDDR,EA(2)           MOVE ADDR FOR UNPACKING
   24F3 0E 00 2550 3C1C         507         ALC   XCUNT,ONED(1)        LENGTH OF CHAR
   24F9 0C 00 2559 2550         508         MVC   YCUNT,XCUNT(1)       MOVE LENGTH
   24FF 0C 01 2558 3C1A         509         MVC   YDDR,EB(2)           ASSIGN ADDRESS FOR CONVERTING
   2505 0C 00 2514 3C20         510         MVC   KCMPX+1,TEM(1)       SET LENGTH FOR COMPARING
   250B 35 01 2552              511         L     XDDR,XR1
   250F 35 02 2558              512         L     YDDR,XR2
   2513 6D 00 00 00             513 KCMPX  CLC    0(,XR1),0(*-*,XR2)
   2517 F2 81 04                514         JE    XOKX                 NO ERR THEN JUMP TO XOKX
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  251A 3C 5B 3B73                515          MVI   BUF-2,C'$'
  251E 0E 01 3C20 3C1C           516 XOKX     ALC   TEM,ONED(2)
  2524 0C 01 3B78 3C20           517          MVC   QOUNT,TEM(2)
  252A 0E 01 3B78 3C20           518          ALC   QOUNT,TEM(2)
  2530 C2 01 3B25                519          LA    BUF-80,XR1
  2534 34 01 2554                520          ST    XDDR1,XR1
  2538 C2 01 3B4D                521          LA    BUF-40,XR1
  253C 34 01 255D                522          ST    YDDR1,XR1
  2540 0E 01 2554 3B78           523          ALC   XDDR1,QOUNT(2)
  2546 0E 01 255D 3B78           524          ALC   YDDR1,QOUNT(2)
  254C C0 87 021E                525          B     UNPACK
  2550 00                2550    526 XOUNT    DC    XL1'00'
  2551 0000              2552    527 XDDR     DC    XL2'0000'
  2553 0000              2554    528 XDDR1    DC    XL2'0000'
  2555 C0 87 021E                529          B     UNPACK
  2559 00                2559    530 YOUNT    DC    XL1'00'
  255A 0000              255B    531 YDDR     DC    XL2'0000'
  255C 0000              255D    532 YDDR1    DC    XL2'0000'
  255E C0 87 021A                533          B     PRINT
  2562 06                2562    534          DC    XL1'06'
  2563 58                2563    535          DC    IL1'88'
  2564 3B75              2565    536          DC    AL2(BUF)
  2566 F2 87 55                  537          J     XDONE
  2569 0E 01 3C14 3C1E           538 XVER16   ALC   SA,D000F(2)
  256F 0F 01 3C18 3C1E           539          ALC   SB,D000F(2)
  2575 0C 01 25A6 3C14           540          MVC   XUNPK,SA(2)
  257B 0C 01 25AF 3C18           541          MVC   YUNPK,SB(2)
  2581 0E 01 3C14 3C1C           542          ALC   SA,CNED(2)
  2587 0E 01 3C18 3C1C           543          ALC   SB,ONED(2)
  258D 35 01 25A6                544          L     XUNPK,XR1
  2591 35 02 25AF                545          L     YUNPK,XR2
  2595 6D 0F 00 00               546          CLC   0(,XR1),0(16,XR2)
  2599 F2 81 04                  547          JE    XOKY
  259C 3C 5B 3B73                548          MVI   BUF-2,C'$'
  25A0 C6 87 021E                549 XOKY     B     UNPACK
  25A4 10                25A4    550          DC    IL1'16'
  25A5 0000              25A6    551 XUNPK    DC    XL2'0000'
  25A7 3B45              25A8    552          DC    AL2(BUF-48)
  25A9 C0 87 021E                553          B     UNPACK
  25AD 10                25AD    554          DC    IL1'16'
  25AE 0000              25AF    555 YUNPK    DC    XL2'0000'
  25B0 3B6D              25B1    556          DC    AL2(BUF-8)
  25B2 C0 87 021A                557          B     PRINT
  25B6 01                25B6    558          DC    XL1'01'
  25B7 58                25B7    559          DC    IL1'88'
  25B8 3B75              25B9    560          DC    AL2(BUF)
  25BA C0 87 24BD                561          B     XOOPD
  25BE C0 87 021A        25BE    562 XDONE    EQU   *
  25C2 01                        563          B     PRINT
  25C3 2F                25C2    564          DC    XL1'01'
  25C4 3A67              25C3    565          DC    IL1'47'
  25C6 C0 87 021A        25C5    566          DC    AL2(OPRX)
  25CA 07                        567          B     PRINT
  25CB 2F                25CA    568          DC    XL1'07'
  25CC 3A96              25CB    569          DC    IL1'47'
  25CE C0 87 0222        25CD    570          DC    AL2(OPRY)
  25D2 89E2                      571          B     HALT
                         25D3    572          DC    XL2'89E2'
  25D4 30 00 2640                573
  25D8 3D 05 2640                574          SNS   TERP,X'00'
  25DC C0 01 2609                575          CLI   TERP,X'05'
  25E0 3C 02 2640                576          BNE   ENDLOD
  25E4 C0 87 2343                577          MVI   TERP,X'02'
                                 578          B     ACT
  25E8 3D 02 2640                579
  25EC F2 81 1A                  580 PRINTQ   CLI   TERP,X'02'
                                 581          JE    ENDLOD
                         25EF    582 PRINTX   EQU   *
```

GET LENGTH AFTER UNPACKING
GET LENGTH AFTER UNPACKING

GET START ADDRESS IN BUF
GET ADDRESS FOR UNPACKED CODE
GET START ADDRESS IN BUF OF MICRO CO

ADVANCE OFFSET

UNPACK CODE

PRINT BUF

ADVANCE ADDRESS TO END OF CODE

MOVE TO UNPACK AREA

POINT TO NEXT STARTING ADDRESS

UNPACK CODE

PRINT CODE

PRINT OPERATOR MESSAGE

OPERATOR PRINT

ERROR HALT # E2

RESET OPTION TO 2

LOAD CORE ONLY ?


```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  25EF 0C 01 2608 4DE6           583          MVC   ENDADD,ADMLT(2)
  25F5 0E 01 2608 264C           584          ALC   ENDADD(2),ENTT
  25FB 0E 01 2608 264C           585          ALC   ENDADD(2),ENTT
  2601 C0 87 3B79                586          B     DUMP
  2605 3D95              2606    587          DC    AL2(MLTAC)
  2607 0000              2608    588 ENDADD   DC    XL2'0000'
                                 589
  2609 C0 87 021A        2609    590 ENDLOD   EQU   *
  260D 06                        591          B     PRINT
  260E 2F                260D    592          DC    XL1'06'
  260F 3AC5              260E    593          DC    IL1'47'
  2611 39 C0 0208        2610    594          DC    AL2(OPRK)
  2615 C0 90 3C57                595          TBF   SBYTE0,SSW00+SSW01
  2619 C0 87 0222                596          BF    BLOD
  261D 89A4                      597          B     HALT
  261F 38 08 020D        261E    598          DC    XL2'89A4'
                                 599          TBN   SBYTE5,SSW2C
  2623 C0 90 3C57                600 *
  2627 35 20 1FFF                601          BF    BLOD
  262B C0 87 021A                602          L     X'1FFF',PIIAR
  262F 06                        603 ADCHK    B     PRINT
  2630 11                262F    604          DC    XL1'06'
  2631 38DA              2630    605          DC    IL1'17'
  2633 C0 87 0222        2632    606          DC    AL2(ADK)
  2637 89E3                      607          B     HALT
  2639 C0 87 3C41        2638    608          DC    XL2'89E3'
                                 609          B     LINKK
                                 610 *
                                 611
                                 612 **************
                                 613 *      VARIABLES ***********************************************************
                                 614 **************
  263D 0000              263E    615 TEMP     DC    XL2'0'
  263F 0000              2640    616 TERP     DC    XL2'0'
                                 617 **************
                                 618 *      CONSTANTS ***********************************************************
                                 619 **************
  2641 0216              2642    620 LINKA    DC    XL2'0216'
  2643 0100              2644    621 X0100    DC    XL2'0100'
  2645 0200              2646    622 X0200    DC    XL2'0200'
  2647 0300              2648    623 X0300    DC    XL2'0300'
  2649 0400              264A    624 X0400    DC    XL2'0400'
                                 625
  264B 0000              264C    626 ENTT     DC    XL2'0000'
  264D 2868              264E    627 ADMICD   DC    AL2(UNUSD)
                                 628
  264F C5C9E3C8C5D940C3  267F    629          DC    CL49'EITHER CARD READER OR FILE MUST BE USED AS LOADER'
  2657 C1D9C440D9C5C1C4          629
  265F C5D940D6D940C6C9          629
  2667 D3C540D4E4E2E340          629
  266F C2C540E4E2C5C440          629
  2677 C1E240D3D6C1C4C5          629
  267F D9                        629
  2680 40C4C5E5C9C3C5    2686    630 ERR6     DC    CL07' DEVICE'
  2687 C3C1D9C440E2C5D8  2687    631 ERR7     DC    CL49'CARD SEQUENCE IS OUT OF ORDER'
  268F E4C5D5C3C540C9E2          631
  2697 40D6E4E340D6C640          631
  269F D6D9C4C5D9404040          631
  26A7 4040404040404040          631
  26AF 4040404040404040          631
  26B7 40                        631
  26B8 C3C1D9C440C9C340  26E8    632 ERR8     DC    CL49'CARD ID IS NOT FC7'
  26C0 C9E240D5D6E340C6          632
  26C8 C3F7404040404040          632
  26D0 4040404040404040          632
  26D8 4040404040404040          632
  26E0 4040404040404040          632
  26E8 40                        632
```

MOVE IN BUFFER START ADDRESS
ADD 2 TIMES OF # OF INSTRUCTIONS
FOR ENDING ADDRESS FOR DUMP
PRINT PROGRAM
START ADDRESS
ENDING ADDRESS

OPERATOR PRINT
MICROCODE LOAD OK

HALT * A4 **************************
IF SSW04 IS ON
TEST FOR 893 LOADED BY FC8
MICROCODE HAS LOADED
TERMINATE SECTION
RETURN TO PGM FC8
PRINT
ATTACHMENT
CHECK

8930 FC7 MICRO-CODE LOADER PROGRAM

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
    26E9 4040404040C3D6D9 2706  633         DC    CL30'      CORE IS NOT LARGE ENOUGH '
    26F1 C540C9E240D5D6E3       633
    26F9 40D3C1D9C7C540C5       633
    2701 D5D6E4C7C840           633
    2707 E2C5E340C4C140E2 2737  634 ERR9    DC    CL49'SET DA SWITCH 04 WILL GIVE A DUMP                '
    270F E6C9E3C3C840F0F4       634
    2717 40E6C9D3D340C7C9       634
    271F E5C540C140C4E4D4       634
    2727 D7404040404C4040       634
    272F 4040404040404040       634
    2737 40                     634
    2738 C5C9E3C8C5D940D5 2768  635 ERRF    DC    CL49'EITHER NO END CARD OR PROGRAM TOO LONG            '
    2740 D640C5D5C440C3C1       635
    2748 D9C440D6D940D7D9       635
    2750 D6C7D9C1D440E3D6       635
    2758 D640D3D6D5C74C40       635
    2760 4040404040404040       635
    2768 40                     635
```


8930 FC7 MICRO-CODE LOADER PROGRAM

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                                637
                            2769 638 TABLE   EQU   *            MAP OF MICROCODE
    2769                    2769 639         DS    CL1          0 BYTE RESERVED
    276A                    2770 640 PART#   DS    CL7          1-7      PART NUMBER
    2771                    2771 641         DS    CL1          8        RESERVED
    2772                    2777 642 EC#     DS    CL6          9-14     EC NUMBER
    2778                    2778 643 ECSFX   DS    CL1          15       EC SUFFIX
    2779                    2788 644 OPREG   DS    32XL2        16-79    OP DECODE DATA
    2789                    278A 645 NINST   DS    XL2          80-81    NUMBER OF MICROINSTRUCTIONS
    2788                    278E 646 CHKSUM  DS    XL4          82-85    CHECK SUM
    278F                    2868 647 UNUSD   DS    CL170        86-255   UNUSED
    2869                    3868 648 MICOD2  DS    16XL256       256-XXXX MICROCODE
    3869                    3888 649 MICOD   DS    XL80
                                650
                                651 ******  MESSAGES  *********
                                652
    3889 D4C3E240D3D6C1C4 38C9  653 MCSLOD   DC    CL17'MCS LOADING ERROR'
    38C1 C9D5C740C5D9D9D6       653
    38C9 D9                     653
    38CA C1E3E3C1C3C8D4C5 38DA  654 ADR      DC    CL17'ATTACHMENT CHECK '
    38D2 D5E340C3C8C5C3D2       654
    38DA 40                     654
    38DB C6C3F74040D4C9C3 38FC  655 OPR1     DC    CL34'FC7  MICRO-CODE LOADER PROGRAM    '
    38E3 D9D660C3D6C4C540       655
    38EB D3D6C1C4C5D940D7       655
    38F3 D9D6C7D9C1D44040       655
    38FB 4040                   655
    38FD E2C5D3C5C3E340D6 3930  656         DC    CL52'SELECT OPTION BY PUTTING XX VALUE INTO DATA SWITCHES'
    3905 D7E3C9D6D540C2E8       656
    390D 40D7E4E3E3C9D5C7       656
    3915 40E7E740E5C1D3E4       656
    391D C540C9D5E3D640C4       656
    3925 C1E3C140E2E6C9E3       656
    392D C3C8C5E2               656
    3931 40C1D5C440D9C5E2 3943  657 OPR2     DC    CL19' AND RESETTING HALT'
    3939 C5E3E3C9D5C740C8       657
    3941 C1D3E3                 657
    3944 C6C3F74040D4C9C3 395F  658 MSGLD    DC    CL28'FC7  MICRO-CODE BEING LOADED'
    394C D9D660C3D6C4C540       658
    3954 C2C5C9D5C740D3D6       658
    395C C1C4C5C4               658
    3960 F0F1406040D3D6C1 3994  659 OPR3     DC    CL53'01 - LOAD AND SENSE CONTROL STORE & PRINT OBJECT CODE'
    3968 C440C1D5C440E2C5       659
    3970 D5E2C540C3D6D5E3       659
    3978 D9D6D340E2E3D6D9       659
    3980 C5405040D7D9C9D5       659
    3988 E340D6C2D1C5C3E3       659
    3990 40C3D6C4C5             659
    3995 F0F2406040D3D6C1 39BA  660 OPR4     DC    CL38'02 - LOAD AND SENSE CONTROL STORE ONLY'
    399D C440C1D5C440E2C5       660
    39A5 D5E2C540C3D6D5E3       660
    39AD D9D6D340E2E3D6D9       660
    39B5 C540D6D5D3E8           660
    39BB F0F3406040E2C5D5 39E1  661 OPR5     DC    CL39'03 - SENSE AND PRINT FC7  CONTROL STORE'
    39C3 E2C540C1D5C440D7       661
    39CB D9C9D5E340C6C3F7       661
    39D3 4040C3D6D5E3D9D6       661
    39DB D340E2E3D6D9C5         661
    39E2 C5D5E2E4D9C540C4 3A0F  662         DC    CL46'ENSURE DATA DECK FC7 FOR      MICRO-LOADER IS '
    39EA C1E3C140C4C5C3D2       662
    39F2 40C6C3F740C6D6D9       662
    39FA 4040404040D4C9C9       662
    3A02 C3D9D660D3D6C1C4       662
    3A0A C5D940C9E240           662
    3A10 C9D540D7D9C9D4C1 3A38  663 OPR6     DC    CL41'IN PRIMARY HOPPER. RESET HALT TO CONTINUE'
    3A18 D9E840C8D6D7D7C5       663
    3A20 D96B40D9C5E2C5E3       663
    3A28 40C8C1D3E340E3D6       663
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3A30 40C3D6D5E3C9D5E4       663
   3A38 C5                     663
   3A39 E2C5E340C4C1E3C1 3A67  664 OPRX   DC    CL47'SET DATA SWITCH TO 05 - TRY TO RELOAD MICROCODE'
   3A41 40E2E6C9E3C3C840       664
   3A49 E3D640F0F5406040       664
   3A51 E3D9E840E3D640D9       664
   3A59 C5D3D6C1C440D4C9       664
   3A61 C3D9D6C3D6C4C5         664
   3A68 C6D9D6D440C3D6D9 3A96  665 OPRY   DC    CL47'FROM CORE, OTHERWISE SECTION TERMINATES      '
   3A70 C56840D6E3C8C5D9       665
   3A78 E6C9E2C540E2C5C3       665
   3A80 E3C9D6D540E3C5D9       665
   3A88 D4C9D5C1E3C5E240       665
   3A90 4040404040404040       665
                3AA9           666 LEVEL  EQU   *+18
   3A97 D4C9C3D9D660C3D6 3AC5  667 OPRK   DC    CL47'MICRO-CODE (LEVEL X) LOADED SUCCESSFULLY     '
   3A9F C4C5404DD3C5E5C5       667
   3AA7 D340E75D40D3D6C1       667
   3AAF C4C5C440E2E4C3C3       667
   3AB7 C5E2E2C6E4D3D3E8       667
   3ABF 4040404040404040       667
   3AC6 40C1C4C4D9404040 3ACD  668         DC    CL8' ADDR   '
   3ACE 4040404040C3D6C4C5 3AF5  669       DC    CL40'     CODE READ INTO CORE                '
   3AD6 40D9C5C1C440C9D5       669
   3ADE E3D640C3D6D9C540       669
   3AE6 4040404040404040       669
   3AEE 4040404040404040       669
   3AF6 4040404040C3D6C4C5 3B1D  670 OPRT   DC    CL40'     CODE SENSED                      ERR '
   3AFE 40E2C5D5E2C5C440       670
   3B06 4040404040404040       670
   3B0E 4040404040C4C040       670
   3B16 40404040C5D5D940       670
   3B1E 0000000000000000 3B75  671 BUF    DC    XL88'00'
   3B26 0000000000000000       671
   3B2E 0000000000000000       671
   3B36 0000000000000000       671
   3B3E 0000000000000000       671
   3B46 0000000000000000       671
   3B4E 0000000000000000       671
   3B56 0000000000000000       671
   3B5E 0000000000000000       671
   3B66 0000000000000000       671
   3B6E 0000000000000000       671
   3B76 40              3B76   672         DC    CL1' '
   3B77 0000            3B78   673 QOUNT  DC    XL2'00'
                               674
                               675 ********************************************************************
                               676 *       SUBROUTINE DUMP                                            *
                               677 ********************************************************************
                               678 *       CALLING SEQUENCE                                           *
                               679 *                                                                  *
                               680 *            B     DUMP                                            *
                               681 *            DC    AL2(STARTING ADDRESS)                           *
                               682 *            DC    AL2(ENDING ADDRESS)                             *
                               683 ********************************************************************
                               684
   3B79 34 08 3C0D             685 DUMP   ST    DMP100+3,ARR          SAVE RETURN ADDRESS
   3B7D 34 02 3C09             686        ST    SXR2+3,XR2            SAVE XR2
                        3B79   687        USING DUMP,XR2
   3B81 C2 02 3B79             688        LA    DUMP,XR2
   3B85 84 01 8C               689        ST    SXR1+3(,XR2),XR1      SAVE XR1
   3B88 85 01 94               690        L     DMP100+3(,XR2),XR1    LOAD PARAMETER ADDRESS
   3B8B 9C 01 9B 01            691        MVC   SA(,XR2),1(2,XR1)     SAVE STARTING ADDRESS
   3B8F 9C 01 9D 03            692        MVC   EA(,XR2),3(2,XR1)     SAVE ENDING ADDRESS
   3B93 D2 01 04               693        LA    4(,XR1),XR1           INCREMENT RETURN ADDRESS
   3B96 34 01 3C0D             694        ST    DMP100+3,XR1          CHANGE RETURN ADDRESS
   3B9A AC 01 A7 9D            695 LOOPD  MVC   TEM(,XR2),EA(2,XR2)   PRESERVE END ADDRESS
   3B9E AF 01 A7 98            696        SLC   TEM(,XR2),SA(2,XR2)   GET LENGTH COUNT FOR PRINT
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              697
   3BA2 AD 01 A7 A5           698        CLC   TEM(,XR2),D000F(2,XR2) 16 CHARACTERS TO PRINT ?
   3BA6 F2 84 34              699        JH    OVER16
                              700
   3BA9 AC 00 4C A7           701        MVC   COUNT(,XR2),TEM(1,XR2) PUT LENGTH COUNT IN PRINT
   3BAD AC 01 4E 9B           702        MVC   ADDR(,XR2),SA(2,XR2)  RH ADDRESS
   3BB1 AE 00 4C A3           703        ALC   COUNT(,XR2),ONED(1,XR2)
   3BB5 AE 01 4E A7           704        ALC   ADDR(,XR2),TEM(2,XR2)
   3BB9 AC 01 9B 4E           705        MVC   SA(,XR2),ADDR(2,XR2)  CURRENT STARTING ADDRESS
   3BBD AE 01 9B A3           706        ALC   SA(,XR2),ONED(2,XR2)
                              707
   3BC1 C0 87 021E            708        B     UNPACK                READY DATA FOR PRINTING
   3BC5 00             3BC5   709 COUNT  DC    XL1'00'
   3BC6 0000           3BC7   710 ADDR   DC    XL2'0000'
   3BC8 3C40           3BC9   711        DC    AL2(BUFFAR)
                              712
   3BCA AC 00 5E 4C           713        MVC   LPRINT(,XR2),COUNT(1,XR2)
   3BCE AE 00 5E 5E           714        ALC   LPRINT(,XR2),LPRINT(1,XR2) DOUBLE PRINT COUNT
                              715
   3BD2 C0 87 021A            716        B     PRINT                 PRINT DATA
   3BD6 01             3BD6   717        DC    XL1'01'
   3BD7 00             3BD7   718 LPRINT DC    XL1'00'
   3BD8 3C40           3BD9   719        DC    AL2(BUFFAR)
                              720
   3BDA F2 87 20              721        J     DONE
                              722
   3BDD AE 01 9B A5           723 OVER16 ALC   SA(2,XR2),D000F(,XR2) ADD FIFTEEN
   3BE1 AC 01 76 9B           724        MVC   LUNPK(,XR2),SA(2,XR2)
   3BE5 AE C1 9B A3           725        ALC   SA(,XR2),ONED(2,XR2)
                              726
   3BE9 C0 87 021E            727        B     UNPACK
   3BED 10             3BED   728        DC    IL1'16'
   3BEE 0000           3BEF   729 LUNPK  DC    XL2'0000'
   3BF0 3C40           3BF1   730        DC    AL2(BUFFAR)
                              731
   3BF2 C0 87 021A            732        B     PRINT                 PRINT DATA
   3BF6 01             3BF6   733        DC    XL1'01'
   3BF7 20             3BF7   734        DC    IL1'32'
   3BF8 3C40           3BF9   735        DC    AL2(BUFFAR)
   3BFA E0 87 21              736        B     LOOPD(,XR2)           RELOOP
                              737
   3BFD C0 87 021A            738 DONE   B     PRINT
   3C01 17             3C01   739        DC    XL1'17'
                              740
   3C02 C2 01 0000            741 SXR1   LA    *-*,XR1               RESTORE XR1
   3C06 C2 02 0000            742 SXR2   LA    *-*,XR2               RESTORE XR2
                              743
   3C0A C0 87 0000            744 DMP100 B     *-*                   RETURN TO MAIN PROGRAM
                              745
   3C0E C0 87 022A            746        B     LOAD
   3C12 40             3C12   747 RESTRT DC    XL1'40'
   3C13 0000           3C14   748 SA     DC    XL2'0000'
   3C15 0000           3C16   749 EA     DC    XL2'0000'
   3C17 0000           3C18   750 SB     DC    XL2'0000'
   3C19 0000           3C1A   751 EB     DC    XL2'0000'
   3C1B 0001           3C1C   752 ONED   DC    XL2'0001'
   3C1D 000F           3C1E   753 D000F  DC    XL2'000F'
   3C1F 0000           3C20   754 TEM    DC    XL2'0000'
   3C21 0000000000000000 3C40 755 BUFFAR DC    XL32'00'
   3C29 0000000000000000      755
   3C31 0000000000000000      755
   3C39 0000000000000000      756
                              757 *
                              758 *       THIS SUBROUTINE WILL DETERMINE WHETHER TO RETURN TO OCP
                              759 *       OR TO TERMINATE THE SECTION.
                              760 *
                        3C41  761 LINKK  EQU   *
```

8930 FC7 MICRO-CODE LOADER PROGRAM

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    3C41 C0 87 021A              762          B     PRINT                   PRINT
    3C45 01                 3C45 763          DC    XL1'01'                  MICRO NOT LOADED
    3C46 15                 3C46 764          DC    IL1'21'
    3C47 3C6F               3C48 765          DC    AL2(MSGNA)
    3C49 C0 87 021A              766          B     PRINT
    3C4D 06                 3C4D 767          DC    XL1'06'
    3C4E 2F                 3C4E 768          DC    IL1'47'
    3C4F 3C9E               3C50 769          DC    AL2(MSGNAA)
    3C51 C0 87 0222              770          B     HALT                    HALT * A4 **************************
    3C55 89A4               3C56 771          DC    XL2'89A4'                IF SSW04 IS ON
    3C57 C0 87 0216              772 BLOD     B     LINK
                                 773
    3C5B D4C9C3D9D660C3D6 3C6F   774 MSGNA    DC    CL21'MICRO-CODE NOT LOADED'
    3C63 C4C540D5D6E340D3        774
    3C6B D6C1C4C5C4              774
    3C70 D9C5C6C5D940E3D6 3C9E   775 MSGNAA   DC    CL47'REFER TO SECTION 891 IF ERRORS WERE ENCOUNTERED'
    3C78 40E2C5C3E3C9D6D5        775
    3C80 40F8F9F140C9C640        775
    3C88 C5D9D9D6D9E240E6        775
    3C90 C5D9C540C5D5C3D6        775
    3C98 E4D5E3C5D9C5C4          775
                                 776 *
                                 777 *
                                 778 *          THIS SUBROUTINE IS USED TO SNS EACH HDB AND ENSURE
                                 779 *          THAT IT HAS BEEN CORRECTLY LOADED WITH X'00'.
                                 780 *
    3C9F 34 08 3D14              781 SNSDEC   ST    ESNS+3,ARR               SAVE FOR RETURNING
    3CA3 30 00 3CDE              782 SNS1     SNS   SAVSNS,X'00'
    3CA7 0D 01 3CDE 3CD7         783          CLC   SAVSNS(2),DZERO          IS HDB X'00'?
    3CAD F2 81 55                784          JE    SETRET
    3CB0 C0 87 021E              785          B     UNPACK                   UNPACK
    3CB4 01                 3CB4 786          DC    XL1'01'                   BITS 8-15
    3CB5 3CE8               3CB6 787          DC    AL2(WORK2)
    3CB7 3CF4               3CB8 788          DC    AL2(MSGH)
    3CB9 C0 87 021E              789          B     UNPACK                   UNPACK
    3CBD 01                 3CBD 790          DC    XL1'01'                   BITS 0-7
    3CBE 3CE7               3CBF 791          DC    AL2(WORK2-1)
    3CC0 3CF1               3CC1 792          DC    AL2(MSGH-3)
    3CC2 C0 87 021A              793          B     PRINT                    PRINT
    3CC6 C6                 3CC6 794          DC    XL1'C6'                   HDB
    3CC7 19                 3CC7 795          DC    IL1'25'                    ERROR
    3CC8 3D04               3CC9 796          DC    AL2(MSGHDB)
    3CCA 89E4               3CCB 797          DC    XL2'89E4'
    3CCC C0 87 0222              798          B     HALT                     ERROR HALT * E4 ***************
    3CD0 89E4               3CD1 799          DC    XL2'89E4'
    3CD2 C0 87 3C41              800          B     LINKK
    3CD6 0000               3CD7 801 DZERO    DC    XL2'0000'
    3CD8 0008               3CD9 802 X0010    DC    XL2'0008'
    3CDA 0000               3CDB 803 ADD      DC    XL2'0000'
    3CDC 00                 3CDC 804 SWITCH   DC    XL1'00'
    3CDD 0000               3CDE 805 SAVSNS   DC    XL2'00'
    3CDF 1011               3CE0 806 COUNT2   DC    XL2'1011'
    3CE1 0001               3CE2 807 COUNT1   DC    XL2'0001'
    3CE3 2021               3CE4 808 COUNT3   DC    XL2'2021'
    3CE5 3031               3CE6 809 COUNT4   DC    XL2'3031'
    3CE7 0000               3CE8 810 WORK2    DC    XL2'00'
    3CE9 0101               3CEA 811 A0101    DC    XL2'0101'
    3CEB 00                 3CEB 812 SECSW    DC    XL1'00'
    3CEC C8C4C240F0F061F0 3CF4   813 MSGH     DC    CL9'HDB 00/01'
    3CF4 F1                      813
    3CF5 404DC8C5E75D40D5 3D04   814 MSGHDB   DC    CL16' (HEX) NOT ZERO'
    3CFD D6E340E9C5D9D640        814
    3D05 0E 01 3CE8 3CEA         815 SETRET   ALC   WORK2(2),A0101           SETUP FOR
    3D0B 0E 00 3CA4 3C1C         816          ALC   SNS1+1(1),ONED             NEXT PASS
    3D11 C0 87 0000              817 ESNS     B     *-*                      RETURN
                                 818 ****************************
                                 819 *          CHECKSUM SUBROUTINE  ******************************************
                                 820 ****************************
```


8930 FC7 MICRO-CODE LOADER PROGRAM

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                 821
    3D15 C2 01 2869              822 GENSUM LA    UNUSD+1,XR1            LOAD ADDRESS OF MICRO MAP
    3D19 F2 87 04                823        J     STARR                  GO STORE ARR
    3D1C C2 01 3D95              824 SUMCHK LA    MLTAC,XR1              LOAD ADDRESS OF SENSED MICRO CODE
    3D20 34 08 3D92              825 STARR  ST    ORI+3,ARR              STORE RETURN ADDRESS
    3D24 0C 03 3D85 3D8C         826        MVC   PAR+3,ALLO(4)
    3D2A 0C 01 3D88 278A         827        MVC   MCSC(2),NINST
    3D30 3C 80 3D5E              828        MVI   ORF+QQ,NOOP
    3D34 C2 02 3D82              829 ORA    LA    PAR,XR2                LOAD A(PARITY BYTES)
    3D38 3C 80 3D77              830        MVI   ORH+QQ,NOOP            SET JUMP TO NOOP
    3D3C 1C 00 3D86 00           831 ORC    MVC   WRK(1),0(,XR1)         MOVE SENSED BYTE TO WORK FIELD
    3D41 2C 00 3D4C 00           832        MVC   ORD+QQ(1),0(,XR2)      MOVE PARITY BYTE
    3D46 1C 00 3D50 00           833        MVC   ORE+QQ(1),0(,XR1)      MOVE SENSED BYTE
    3D4B 3B 00 3D86              834 ORD    SBF   WRK,0                  TAKE PARITY OF THIS SENSED BYTE
    3D4F BB 00 00                835 ORE    SBF   0(,XR2),0              AND THIS PARITY BYTE
    3D52 8E 00 00 3D86           836        ALC   0(,XR2),WRK(1)         ADD REMAINING BYTE
    3D57 D2 01 01                837        LA    1(,XR1),XR1            INCRESE REMAINING BITS
    3D5A E2 02 01                838        LA    1(,XR2),XR2            INCREMENT PCINTER TO PARITY BYTES
    3D5D F2 80 08                839 ORF    JC    ORG,NOOP               JUMP EVERY OTHER TIME
    3D60 3C 87 3D5E              840        MVI   ORF+QQ,BRANCH          RESET JUMP TO A BRANCH
    3D64 C0 87 3D3C              841        B     ORC                    REPEAT FOR SECOND BYTE OF SNSED DATA
    3D68 0F 01 3D88 3D8E         842 ORG    SLC   MCSC(2),ONET           DECREMENT COUNT OF INSTRUCTIONS
    3D6E C0 81 3D8F              843        BZ    ORI                    SENSE DONE
    3D72 3C 80 3D5E              844        MVI   ORF+QQ,NOOP            RESET JUMP TO NOOP
    3D76 C0 80 3D34              845 ORH    BC    ORA,NOOP               JUMP EVERY OTHER TIME
    3D7A 3C 87 3D77              846        MVI   ORH+QQ,BRANCH          RESET JUMP TO BRANCH
    3D7E C0 87 3D3C              847        B     ORC                    REPEAT FOR SECOND PAIR OF PARITY
                                 848 *                                   BYTE
                            3D82 849 PAR    EQU   *                      PARITY BYTES USED FOR CHECK SUM
    3D82 00000000           3D85 850        DC    XL4'00'
    3D86 00                 3D86 851 WRK    DC    XL1'00'
    3D87 0000               3D88 852 MCSC   DC    XL2'00'
    3D89 00000000           3D8C 853 ALLO   DC    XL4'00000000'
    3D8D 0001               3D8E 854 ONET   DC    XL2'0001'
                            0001 855 QQ     EQU   1
                            0080 856 NOOP   EQU   X'80'
                            0087 857 BRANCH EQU   X'87'
    3D8F C0 87 0000              858 ORI    B     *-*                    RETURN TO USER
                                 859 *
                                 860 *************
                                 861 *      EQUATES ***********************************************************
                                 862 *************
                                 863
                            0001 864 XR1    EQU   1
                            0002 865 XR2    EQU   2
                            0008 866 ARR    EQU   8
                            0004 867 PSR    EQU   4
                            00A0 868 IAR2   EQU   X'A0'
                            0020 869 P1IAR  EQU   X'20'
                            0222 870 HALT   EQU   X'222'
                            0212 871 TEST   EQU   X'212'
                            021A 872 PRINT  EQU   X'21A'
                            021E 873 UNPACK EQU   X'21E'
                            0216 874 LINK   EQU   X'216'
                            0203 875 SIZE   EQU   X'203'        SRT - CORE SIZE OF THE SYSTEM
                            0208 876 SBYTE0 EQU   X'208'
                            0080 877 SSW00  EQU   X'80'         LOOP ON SECTION
                            0040 878 SSW01  EQU   X'40'         LOOP ON ROUTINE
                            020A 879 SBYTE2 EQU   X'20A'        SECOND BYTE OF SENSE SWS
                            020D 880 SBYTES EQU   X'20D'
                            0008 881 SSW2C  EQU   X'08'                SSW 2C
                            0001 882 SSW2F  EQU   X'01'
                            0080 883 SSW10  EQU   X'80'         SSW 10
                            0226 884 PACK   EQU   X'226'        SRT - ENTRY TO PACE EBCDIC TO HEX
                            022A 885 LOAD   EQU   X'22A'        SRT - ENTRY TO LOAD
                            0232 886 UTAB   EQU   X'232'        SRT - FIRST BYTE
                            0880 887 INPUT  EQU   X'880'        ADDRESS OF READIN AREA
    3D93 0000               3D94 888 GARBE  DC    XL2'00'       UNUSED
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3D95  889 MLTAC  EQU   *              BUFFER FOR SENSED BACK CODE
   3D95                  4D94  890         DS    16XL256
                         4D95  891 ENMLT  EQU   *
   4D95                  4DE4  892         DS    XL80
   4DE5 3D94             4DE6  893 ADMLT  DC    AL2(MLTAC-1)
                               894
   4DE7 D7C1E3C3C840C6D6 4DF8  895 FORME  DC    CL18'PATCH FORMAT ERROR'
   4DEF D9D4C1E340C5D9D9       895
   4DF7 D6D9                   895
   4DF9 E3C8C540C6D6D3D3 4E18  896 PATCHX DC    CL32'THE FOLLOWING PATCHES WERE ADDED'
   4E01 D6E6C9D5C740D7C1       896
   4E09 E3C3C8C5E240E6C5       896
   4E11 D9C540C1C4C4C5C4       896
   4E19 C1C4C4D940C4C1E3 4E21  897 PATCHH DC    CL9'ADDR DATA'
   4E21 C1                     897
   4E22 E7E7E7E740E7E7E7 4E2A  898 PPATCH DC    CL9'XXXX XXXX'
   4E2A E7                     896
   7000                        899         ORG   X'7000'
                         7000  900 PATCH  EQU   *
   7000 FFFFFFFFFFFFFFFF 70FF  901         DC    256XL1'FF'             MICRO PATCH AREA
   7008 FFFFFFFFFFFFFFFF       901
   7010 FFFFFFFFFFFFFFFF       901
   7018 FFFFFFFFFFFFFFFF       901
   7020 FFFFFFFFFFFFFFFF       901
   7028 FFFFFFFFFFFFFFFF       901
   7030 FFFFFFFFFFFFFFFF       901
   7038 FFFFFFFFFFFFFFFF       901
   7040 FFFFFFFFFFFFFFFF       901
   7048 FFFFFFFFFFFFFFFF       901
   7050 FFFFFFFFFFFFFFFF       901
   7058 FFFFFFFFFFFFFFFF       901
   7060 FFFFFFFFFFFFFFFF       901
   7068 FFFFFFFFFFFFFFFF       901
   7070 FFFFFFFFFFFFFFFF       901
   7078 FFFFFFFFFFFFFFFF       901
   7080 FFFFFFFFFFFFFFFF       901
   7088 FFFFFFFFFFFFFFFF       901
   7090 FFFFFFFFFFFFFFFF       901
   7098 FFFFFFFFFFFFFFFF       901
   70A0 FFFFFFFFFFFFFFFF       901
   70A8 FFFFFFFFFFFFFFFF       901
   70B0 FFFFFFFFFFFFFFFF       901
   70B8 FFFFFFFFFFFFFFFF       901
   70C0 FFFFFFFFFFFFFFFF       901
   70C8 FFFFFFFFFFFFFFFF       901
   70D0 FFFFFFFFFFFFFFFF       901
   70D8 FFFFFFFFFFFFFFFF       901
   70E0 FFFFFFFFFFFFFFFF       901
   70E8 FFFFFFFFFFFFFFFF       901
   70F0 FFFFFFFFFFFFFFFF       901
   70F8 FFFFFFFFFFFFFFFF       901
                               902 *
                               903 *     PATCH FORMAT
                               904 *     AAAADDDD0000AAAADDDDDDDDFFFF
                               905 *     WHERE  AAAA = 4 DIGIT HEX ADDRESS (HI 5 BITS MUST BE ZEROES)
                               906 *            DDDD = HEX DATA (MUST BE PUT IN IN GROUPS OF 4 DIGITS,
                               907 *                   WHERE EACH 4 DIGITS IS 1 MICRO-WORD.  THERE CAN
                               908 *                   BE MORE THAN 1 WORD SPECIFIED.  EACH WORD MUST
                               909 *                   CONTAIN 4 DIGITS AND WILL BE PLACED IN THE MICRO
                               910 *                   STORAGE MAP IN ASCENDING ORDER UNTIL A DELIMITER
                               911 *                   IS REACHED.
                               912 *            0000 = DELIMITER (END OF PATCHES AT THIS ADDRESS)
                         FFFF  913         END   FFFF = END OF ENTIRE PATCH
```


CROSS-REFERENCE

```
SYMBOL   T LEN VALUE DEFN   REFERENCES
ACT      A 001 2343  0385   0363  0578
ACT2     A 004 2076  0114
ADCHK    A 004 2628  0503   0404  0438  0459
ADD      A 002 3CD8  0803   0484* 0500  0502*
ADDR     A 002 39C7  0710   0702* 0704* 0705
ADK      A 017 38DA  0654   0606
ADMICD   A 002 264E  0627   0359
ADMLT    A 002 4DE6  0893   0583
AGAIN    A 004 23B8  0421   0423
ALLO     A 004 3D8C  0853   0312  0626
AMICRO   A 002 2001  0663
ARR      C 001 0008  0866   0685  0781  0825
ATTCHK   C 001 005D  0030   0404  0438  0459
A0101    A 002 3CEA  0811   0815
BLCD     A 004 3C57  0772   0077  0086* 0556  0601
BRANCH   C 001 0087  0857   0840  0846
BUF      A 088 3B75  0671   0497  0497* 0501  0515* 0519  0521  0536  0548* 0552  0556  0560
BUFAD    A 002 2100  0182   0246
BUFED    A 002 210A  0187   0248
BUFFAR   A 032 3C40  0755   0711  0719  0730  0735
BUSY     C 001 005F  0031
BYPASS   A 001 2052  0105   0081  0101
B8930    A 001 0000  0004
CARDIN   A 001 2229  0285   0219
CHKEND   A 001 2201  0267   0250
CHKFCB   A 001 2215  0276   0215
CHKSEQ   A 001 21ED  0258   0209
CHKSUM   A 004 27BE  0646   0352* 0470
CLEAN    A 004 2410  0448   0451
CLEAR    A 004 2064  0110   0113
CLFLAG   A 004 211D  0197
CMLOOP   A 006 218E  0232   0237
COMM     A 001 2146  0210   0203
COMPP    A 001 2450  0464   0461
COUND    A 001 2114  0192   0109* 0112* 0447* 0450*
COUNT    A 001 3BC5  0709   0701* 0703* 0713
COUNT1   A 002 3CE2  0807   0399
COUNT2   A 002 3CE0  0806   0414
COUNT3   A 002 3CE4  0808   0419
COUNT4   A 002 3CE6  0809   0427
CPSTOR   C 001 0058  0034   0437* 0458
DDONE    A 001 23A7  0416   0410
DICKL    A 001 20E0  0162   0153
DMP100   A 004 3C0A  0744   0685* 0690  0694*
DONE     A 004 3BFD  0738   0721
DO2      A 004 236A  0401   0415
DUMP     A 004 3B79  0685   0380  0596  0687  0688
DZERO    A 002 3CD7  0801   0403  0418  0484  0783
D000F    A 002 3C1E  0753   0503  0538  0539  0698  0723
D255     A 002 2106  0185   0360  0364
D256     A 002 2108  0186
EA       A 002 3C16  0749   0487* 0488* 0489* 0490* 0495  0506  0692* 0695
EB       A 002 3C1A  0751   0480* 0481* 0482* 0483* 0509
EC#      A 006 2777  0642
ECSFX    A 001 2778  0643   0386
EMUL     A 004 23B4  0420   0430
ENDADD   A 002 2608  0588   0286  0287  0387  0583* 0584* 0585*
ENDADT   A 001 22E9  0358   0293
ENDLOD   A 001 2609  0590   0576  0581
ENMLT    A 001 4D95  0891   0444* 0445  0445* 0446
ENTAB    A 002 233E  0382   0369*
ENTT     A 002 264C  0626   0359* 0360* 0364* 0369  0441  0453* 0584  0585
EPATCH   A 004 22DA  0351   0315
ERRF     A 049 2768  0635   0271
ERRLOD   A 004 2469  0472
ERR6     A 007 2686  0630   0172
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ERR7	A	049	26B7	0631	0262
ERR8	A	049	26E8	0632	0280
ERR9	A	049	2737	0634	0373
ESNS	A	004	3D11	0817	0781*
FORME	A	018	4DF8	0895	0345
GARBE	A	002	3D94	0888	
GENSUM	A	004	3D15	0822	0351
GETC	A	0C3	2438	0458	0463
HALT	C	001	0222	0870	0102 0144 0159 0264 0273 0282 0347 0375 0571 0597 0607 0770 0798
HDB0	C	001	0048	0032	0401 0402 0403*
HDB0B	C	001	0088	0033	0420
IAR2	C	001	00A0	0868	
INCTOA	A	003	2251	0303	0313
INPUT	C	001	0880	0887	0202 0207 0211 0229 0230 0245
INTPND	C	001	0059	0C29	
KOMPX	A	004	2513	0513	0510*
LENGTH	A	004	218A	0231	0244
LEVEL	A	001	3AA9	0666	0202*
LINK	C	001	0216	0874	0772
LINKA	A	002	2642	0620	0077
LINKK	A	001	3C41	0761	0078 0174 0349 0384 0609 0800
LIO1	A	004	2372	0403	0401* 0406* 0407 0408
LOAD	C	001	022A	0885	0199 0205 0746
LOADC	A	001	2135	0204	0221 0257
LOAT	A	004	23E5	0435	
LOOP	A	006	22FB	0362	0367
LOOPD	A	004	3B9A	0695	0736
LOOPOP	A	003	234E	0391	0395
LOOP1	A	003	23E9	0437	0442
LOOP2	A	003	216A	0222	0228
LPRINT	A	001	38D7	0718	0713* 0714 0714*
LPTR	A	002	210E	0189	
LUNPK	A	002	3BEF	0729	0724*
MCSC	A	002	3D88	0852	0452* 0453 0460* 0827* 0842*
MCSLOD	A	017	38C9	0653	0475
MICOD	A	080	3888	0649	0106* 0107 0107* 0187
MICOD2	A	256	3868	0648	0108
MLTAC	A	001	3D95	0889	0457 0478 0587 0824 0893
MOVE	A	005	21E4	0256	0252* 0253*
MSDAR	C	001	005B	0036	
MSGG	A	004	2088	0119	0116
MSGH	A	009	3CF4	0813	0783 0792
MSGHDB	A	016	3D04	0814	0796
MSGLD	A	028	395F	0658	0099
MSGNA	A	021	3C6F	0774	0765
MSGNAA	A	047	3C9E	0775	0769
NEG1	A	002	2102	0183	0238
NEG3	A	002	2104	0184	0240 0241
NEXDAT	A	003	226C	0311	0340
NG256	A	002	2118	0194	0111 0449
NINST	A	002	27BA	0645	0325 0327* 0362 0452 0482 0483 0489 0490 0827
NOCORE	A	001	2318	0368	
NOOP	C	001	C080	0856	0828 0830 0839 0844 0845
NORM	A	004	203D	0096	0085
NOTRDY	C	001	0058	0028	
NOTSRT	A	004	2280	0316	
NREP	A	001	214A	0212	
NUMIOK	A	004	22AE	0329	0326
ONDE	A	004	2112	0190	0217
ONED	A	002	3C1C	0752	0406 0481 0488 0507 0516 0542 0543 0703 0706 0725 0816
ONET	A	002	3D8E	0854	0235 0324 0460 0842
ONO	A	001	2113	0191	0112 0450
OPDEC	C	001	0059	0035	0391*
OPREG	A	002	27B8	0644	0193
OPRK	A	047	3AC5	0667	0594

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
OPRT	A	040	3B1D	0670	0494
OPRX	A	047	3A67	0664	0566
OPRY	A	047	3A96	0665	0570
OPR1	A	034	38FC	0655	0122
OPR2	A	019	3943	0657	0127
OPR3	A	053	3994	0659	0132
OPR4	A	038	39BA	0660	0137
OPR5	A	039	39E1	0661	0142
OPR6	A	041	3A38	0663	0158
OP32	A	002	2116	0193	0394
ORA	A	004	3D34	0829	0845
ORC	A	005	3D3C	0831	0841 0847
ORD	A	004	3D48	0834	0832*
ORE	A	003	3D4F	0835	0833*
ORF	A	003	3D5D	0639	0828* 0840* 0844*
ORG	A	006	3D68	0842	0839
ORH	A	004	3D76	0845	0830* 0846*
ORI	A	004	3D8F	0858	0825* 0843
OUTGO	A	001	233F	0383	0379
OVER16	A	004	38DD	0723	0699
PACK	C	001	0226	0884	
PAR	A	001	3D82	0849	0352 0470 0826* 0829
PART#	A	007	2770	0640	
PATCH	A	001	7000	0900	0292 0302
PATCHE	A	004	22C6	0342	0317
PATCHH	A	009	4E21	0897	0301
PATCHR	A	003	23DF	0432	0425
PATCHX	A	032	4E18	0896	0297
PFFX	A	004	20CF	0155	0149 0151
PPATCH	A	009	4E2A	0898	0323 0332 0337
PRINT	C	001	021A	0872	0096 0119 0124 0129 0134 0139 0155 0169 0259 0268 0277 0294 0298 0334 0342 0353 0370 0472 0491 0533 0557 0563 0567 0591 0603 0716 0732 0738 0762 0766 0793
PRINTQ	A	004	25E8	0580	0471
PRINTX	A	001	25EF	0582	
PSR	C	001	0004	0867	
PTIAR	C	001	0020	0869	0602*
QOUNT	A	002	3878	0673	0517* 0518* 0523 0524
QQ	C	001	0001	0855	0828* 0830* 0832* 0833* 0840* 0844* 0846*
QUICK	A	002	212B	0201	0076* 0087* 0088*
RESTRT	A	001	3C12	0747	
RTN01	A	001	2005	0068	0016
SA	A	002	3C14	0748	0486* 0496 0538* 0540 0542* 0691* 0696 0702 0705* 0706* 0723* 0724 0725*
SAVSNS	A	002	3CDE	0805	0782* 0783
SB	A	002	3C18	0750	0479* 0539* 0541 0543*
SBYTE0	C	001	0208	0876	0100 0595
SBYTE2	C	001	020A	0879	0115
SBYTE5	C	001	020D	0880	0083 0084* 0599
SECSW	A	001	3CEB	0812	0400* 0409 0411* 0424 0426*
SENSE	A	004	23FE	0444	0290
SEQ	A	001	211C	0195	0208 0216* 0217*
SETRET	A	006	3D05	0815	0784
SETUP	A	001	211D	0196	0161 0164 0167
SETU1	A	001	20BA	0147	0118
SIOI	C	001	0058	0037	0389 0412 0413 0417 0428 0429 0432 0433 0454 0455 0465
SIZE	C	001	0203	0875	
SNSDEC	A	004	3C9F	0781	0405 0421
SNSPRT	A	004	2473	0478	0467
SNS1	A	004	3CA3	0782	0402* 0420* 0422 0816*
SSW00	C	001	0080	0877	0100 0595
SSW01	C	001	0040	0878	0100 0595
SSW10	C	001	0080	0883	0115
SSW2C	C	001	0008	0881	0599
SSW2F	C	001	0001	0882	0083 0084
STARR	A	004	3D20	0825	0823

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
START	A	001	2017	0079	0266 0275 0284
STAT	A	001	20FF	0177	0175 0176 0197 0198
SUMCHK	A	004	3D1C	0824	0468
SWITCH	A	001	3CDC	0804	0080 0082*
SXR1	A	004	3C02	0741	0689*
SXR2	A	004	3C06	0742	0686*
S1	A	004	2194	0233	0231* 0232 0235* 0236
S2	A	004	2198	0234	0232*
TABLE	A	001	2769	0638	0063 0182 0381
TEDONE	A	004	21C6	0245	
TEM	A	002	3C20	0754	0495* 0496* 0503 0505 0510 0516* 0517 0518 0695* 0696* 0698 0701 0704
TEMP	A	002	263E	0615	0304* 0307 0307* 0309 0318* 0331 0392* 0394 0439* 0441
TERP	A	002	2640	0616	0117* 0146* 0288 0377* 0378 0466 0574* 0575 0577* 0580
TEST	C	001	0212	0871	0114
UDT1	A	003	0A0C	0018	
UDT2	A	003	0A0F	0019	
UNPACK	C	001	021E	0873	0320 0329 0498 0525 0529 0549 0553 0708 0727 0785 0789
UNUSD	A	170	2868	0647	0308 0435 0485 0627 0822
UTAB	C	001	0232	0886	0148 0150 0152 0163 0165
WORK	A	002	210C	0188	0226* 0227 0242* 0243 0305* 0316 0322 0324* 0325 0327 0361* 0362 0365* 0366
WORK2	A	002	3CE8	0810	0399* 0414* 0419* 0427* 0787 0791 0815*
WRK	A	001	3D86	0851	0831* 0834* 0836
XDDR	A	002	2552	0527	0506* 0511
XDDR1	A	002	2554	0528	0520* 0523*
XDONE	A	001	25BE	0562	0537
XFFFF	A	002	2008	0070	0314
XKFC7	A	003	2004	0064	0214
XOKX	A	006	251E	0516	0514
XOKY	A	004	25A0	0549	0547
XOOPD	A	006	248D	0495	0561
XOUNT	A	001	2550	0526	0505* 0507* 0508
XR1	C	001	0001	0864	0108* 0110 0110 0111* 0165* 0166 0175 0198* 0207* 0208 0211* 0214 0216 0218 0220 0222 0224 0225 0225* 0226 0229* 0239 0240* 0242 0245* 0246 0248 0252 0253 0254 0254* 0256 0302* 0303 0303* 0304 0305 0311 0311* 0312 0314 0318 0319 0386* 0391 0392 0393 0393* 0435* 0437 0439 0440 0440* 0446* 0448 0448 0449* 0478* 0479 0480 0485* 0487 0487 0511* 0513 0519* 0520 0521* 0522 0544* 0546 0689 0690* 0691 0692 0693 0693* 0694 0741* 0822* 0824* 0831 0833 0837 0837*
XR2	C	001	0002	0865	0176 0197* 0230* 0233 0233 0234 0234 0238* 0239 0241* 0286 0287* 0308* 0309* 0319 0339 0339* 0377 0378 0387* 0392 0394 0439 0441 0441 0457* 0458 0462 0462* 0512* 0513 0545* 0546 0686 0687 0688* 0689 0690 0691 0692 0695 0695 0696 0696 0698 0698 0701 0701 0702 0702 0703 0703 0704 0704 0705 0705 0706 0706 0713 0713 0714 0714 0723 0723 0724 0724 0725 0725 0736 0742* 0829* 0832 0835 0836 0838 0838*
XUNPK	A	002	25A6	0551	0540* 0544
XVER16	A	006	2569	0538	0504
X0010	A	002	3CD9	0802	0502
X0100	A	002	2644	0621	0361 0365
X0200	A	002	2646	0622	
X0300	A	002	2648	0623	
X0400	A	002	264A	0624	
YDDR	A	002	2558	0531	0509* 0512
YDDR1	A	002	255D	0532	0522* 0524*
YOUNT	A	001	2559	0530	0508*
YUNPK	A	002	25AF	0555	0541* 0545

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

THE CHARACTER · INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

```
GBK GBD  PN 42  34256 EC 825023  FC7 MICRO-CODE  LOADER                                  89300000
TCOY|SL  &  H P  ""8U  <D&                                                      L8D89300001
T+S :HFTF&"*A |"  "|B /H&4A|EYW&%  A|DD'"33*8YD4||8  87C-A -4# &H(8Z  &C D8O/"5C D/H1"  ?|C  M.D89300002
T+SA  KX /0HEA/0  9P3X  -T2U $ /0H  SSE<8 CS&CB*8_3S  80-D8R30&HJJ*"0  A(-D/F 8 HJ&/D8  AMF&  LK*89300003
T+SBOOH*8DTS  -.  2D *8 SR 8Y*20H*  8F-<S+|3 /0HE U*  9&88G /YA(LWHOH*  8F-DW*$. /0HEA2  98*  &#U89300004
T+SC./0HSS 0 8R  |  B<?HACT5J T.  2-&*'8-H28-DJ0H*  8F-)P+TT /0HSS G  2/348- H38/ 60-D  8<X4 28089300005
T+SDWY C2-K3 /0H  E1T-W//MB0H*8&K)  Z******&H  & 8>  C08|C1 &-X>|8  &DA &<HBH|"8 KC  "0H* 81*89300006
T+SE/ SY-78*< CD  Z8(?2/1G /0HDD<H  ABHA( 58/G|HAZ8H  ABHA( VY-A|HA010  CHJ1 A-</GBDK *M  8YD 9Q889300007
T+SF*1X7T < AHLN  '4 G2 &(8H-GK &D  4 KD<|)-/C< DHQ.  8 &TQ0-HH6C0 HRM  < BFRHRO>  .-  8 E&89300008
T+SGP 8FN|Q8'A8F  N0HH/TTQ8H&IX -  (-D/AC08H&&4 KD  <|RQ/C<8DHQ.8 &S  L-DRH&A( JU/87H  DH/0 *S889300009
T+SHK SGXFJ0 HI-  P4-DEG  C /2D  50H*8F%Q1I.*N8%8  G SHI8%8GHA /0H  E1TDXEHX30H*8HYX  30H* ).<89300010
T+SI(HA /0HE1TD  W:HX40H*8HYX40H*  -E8HBI--' 2R CHD  T"T7"* C -K.Z0H*  8F-H-L/T /0HE &V  +H*H 'I489300011
T+SHH O"=4-D8G D  W|-D* KD< &8AIT8  W|%H8HFY& SQ=4-D  BL&DA|Q3 -KIJL&D  AH T2-NY9=8D.8Z  "G D 83%89300012
T+S.CIT8AX D *8  G /8BH&1+I&8AH&0  'T-4AI#Y/C|HDA-0  AI#Y/C<8G /8BIT9  +H%8G /YA8M8D8-H  B0H* O#*8&300013
T+S.=HW3 /0HE11I  (=HX%0H*8HYX%0H*  8&*8G|JM< 2;=|QP  /0HEE-0AIU0WL-8  AIU0/A-0AH&0WJ 4  AI#Y 2KD89300014
T+S<9H&32AC8+ KR  <H&Q+ KD<IU&'8KD  .0HHS=00AH38WL<8  G /.FL2*7S;G /0H  SS;F0 CS'ACT2 &T  /3% ED889300015
T+S(4;K)Z C /31  A0-DX;%H8I-T30HA  10&84 LSK &H( LQ  /E%88H48< L3Y|+H  8 C3.|D-T*31H|H&  1KC0 #AD89300016
T+S+?58E)IS? /32  ¬C- T*30*|N T*8  AH7H'"33.8YDH||8  8:"(Q-|(Q0 0A|+-  88<8GH6.3CH 1TC3  PC D 4J489300017
T+S|D|+-89C2H|HL  /32¬|R 8Z< AH#-  ' C3.8YDH|  8:00  A|+-897(Q-|(Q0<8  GH#L30HC30<C8 K/  D*N- 08U8&300018
T+S&V <E)IS>4 L$  K &H_ LR00HHT:L0  L$0<I46#L838 M6  M|A /EE3"  D6 KD  QC0 /EBDL0 DUD 0  A|Q- 8A-8&300019
T+SJ-I#Y< KR<|QT  30HC30<C8 T60%E-  0N4WH08A|Q-'T%8  AIECS -. /2688S5  |&<W8<8AIG| /34  *C&< PD*8930C020
```

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+SK$|QMX?%BAI:T	/OHE11D820UA0-D	'VL&A|A-4 L0EC0D	8FT0*C-D8FS::C-D	8FS::C D8633P0-D	YEL& 9/D89300021
T+SLD L0M(D8E-8	A|AQ8G 8A|AQX>-8	A|AQX>%EG /YBGC%	)C D8HC00C0D8HC0	MCE*#)L_60H*8G-H	863% 00 89300022
T+SMJH-8A|(%8&&4	A|8 8G?HD--0 IN	8H 0AINH8E-8 IN	8G 0 INUVM 0AIN%	8F-0 IJ&8HCMAINH	5 SM 8BY8&300023
T+SN<D64 C2-&&	8O3_3C-D8HC0*C D	#;C0-C-D#;C0-0-D	#IL&AINLB L_((D	VP&8AIN&#; 8AIN4	#;< °D<89300024
T+SOG/0H: C	/0H: C /0H	EAV-#)¬HGN&8A|A&	8G-8A|A-8G-0AIEQ	8E 0AIE88F 8A|A&	8G 8 L1D89300025
T+SPB L0Q|A05 KQ	W(&HV.64| C2-&&	8O3_3OH*8G/ C_	EOH*8G/ C__0H*	8F-E0+7P /2K'0H*	8F-D O3089300026
T+SP'.3ZXOH*8F-*	?+Z$ /0HSS;HO BR	|&NW&< AI-U8 SR	0H*T&34BIUC2-JY	< KQHL;Q+ KQHIU0	+ KQ 31<89300027
T+SQ8BBR<OH*#;L6	N C /0HEAS8:1LX	-T UC1P0H*BHYW	U+ -BC*B&|E*5HA"	"0H*8F-QJ+(, /0H	SS;< 8SQ89300028
T+SR30H*8&&	BE-D - C &	YE<PI88TE6MCC0)X	D&(XE0*LE6MC06MC	F2)|E&(LU8>(0%N	9+H ;HM8&300029
T+SE>1*J 0;I 4*$	A1<PR&<LE9*XC1*|	A6*J &%PQ9<PN0@N	2;I 5>LT&($F&($	R1<PR&DA &DA &DA	&D 41*89300030
T+S$Z&DA &DA &DA	0@GR1DCI1DCI&UC	N5>(1%|7&DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&D 0RQ89300031
T+S*U&DA &<|O6*N	2;I 5)$T&(|A6*¬	E&<PN5>LG2DCS1;(	1<E 8>$I88|H&|C	4&+$I4'(1@XV1MC	A&<& 3I889300032
T+S)¬9(LP&DA &DA	&DA &DA &DA &<P	I8&TE6MCN5UCE5*J	0@GR1DC06MCP6)$	G6*GM&+|O5UCL5_P	G&D $:889300033
T8B)Y&DA &DA &DA					J&<89300034
T+TT35<|S&(|O0*L	I5*) 1)XR5_XA8=|	A0@TM1)PT&<|H1*|	K&<$C'4A 5<XC6)R	-0'$D1MCL5%GD1)V	5'U *8089300035
T+TU>5%¬R0)J &DA	8%PL1*|T&($P8@X	O5MCB:DCP9+|T2)P	G&+¬X&+PA4=LE&<X	N8'R 1<GT0MCS9%X	T0@- 09&89300036
T+TVZ1;I 0)PD&(X	E8%PT8@XN14CH0)|	T1%|76DCM2*|R5WC	C5%LE&<.E2)P&&(|	O0*LE1|C1&FA 4'$	A1D 6Q889300037
T+TWU0)PD&+.E5;.	E&<|O5;|R5_(8>|	O6*N MDCP6*XN84C	O0_GE0=(0'$D1¬C	2&FA 4'$A1DCA5*J	8%M 1H-89300038
T+TX¬5;.E&<|O5;|	R5_(8>|O6*N 5_P	L:|C3&FA 8%PN8%N	0)PD&(¬R2)PT&<$	C'4A 0'$N8'XO44C	S8'Q :Q@89300039
T+TYE6*PE5;.U6*N	1<GT0MCD1*|K&<$	C'4CF5_V &DA &DC	M2*|R5WCL5%GD1)V	2;I 2)N 5'XI5<G	R:D "H&89300040
T+TZN2($P5&PRE4C	R1;.E84CH0)|T&+|	O&<|O5;|I5;LE&%P	T&<LA8@E 8>$I8@|	H&+|O&|C5&FA 8'X	Y&+< 3Q&89300041
T+TD&5UCR1)|O0*J	5<XC6)$C5%LE1_X	O5DCC5_XEE4CO8@T	E6;$I8%N 8%PC8@X	O5MCT1)XM2)PA8@P	S&D JI889300042

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+T..&DA &DA 5<X	C6)R-0'$D1MA(4@P	V1)(955 4'$A1<P	D&+.UJ@|E8>.F9(|	L:DA &DA &DA 0*L	D6M ¬/089300043
T+T%F&DA &DA 0'$	D1MCR1*GD&<XN8*R	0'$R1MA &DA &DA	&DA &DA &DA &DA	&<|O1<N 8%PN8%P	D&D *D089300044
T+T_A&DA &DA &DA	&DA &DA &DA &<P	R6M			31889300045
T+T_@				D C&	H| 4 "H*89300046
T+ 7(H@B*HB+7W	4 Q25 RK* R%AX F	) 'HAAC$A| 6% E;	).0FXW:4AZ:P2/CK	% D2X. E+W:8 LH+	> M8 LQ889300047
T+T?2Z:0AW4:> R>	T0H*8G- C1 . A	:LH8 PV# /0HE &	8&|HGMH8AW:0% PE	$.-F$Y8BG /8&	8&< U.Y89300048
T+T0_/0HE K 8&+B	GH*8G /YP0-D <H	B C /0 0H*BHU	A @		@:<89300049
T+T1Y	<B	G /YAEL1?0H*8F-Q	?|I# /0HSSEL /0H	O5<XC6)R-0'$D1MC	N5>< '0H89300050
T+T2T&(|00*LE:(X	E1%PR&+|O&+.E0=|	IS_N =|X1&<XF&<P	R6)$R8UCW1)XE&<P	N0'$U5:|E6*PD(-	'EC OJN89300051
T+T3: C3:C&D@T3	P@YEN0H*8G-D@:C3	40H*8G-P@93310H*	8F%QR|&KI9<8G SH	I9<8G|DD H	7IH89300052
T+T4RDAD K /<CD	DA <TD0UC0@FG	0@MA(2<PXPMCN5>(	:*PR5U + L3Y|+Y	+ C2U|A3 /0 0-D	YE¬H 1KQ89300053
T+T5M/CL8 L6N(-	'U-0C|QM'T 0A|Q-	X>T2 |N#8 T6@|H	')10 |QQ . 'L	* C5& C% |QE# 8	+ "ZD8V300054
T+T6||Q$K &GS -G	2- -@/35;0H*'| @	A|Q-'T%BA|Q@@-C5	;0H '(C2G|P¬ /34	@ *	KYU89300055
TAC6M/O					K/U89300056
T+U8¬|RLP0:|C2DC	F5_XM0;(1)XR5_X	T2<N 1_$L4'$W2)P	G&(¬A8@|H1;I 9%P	R1MCA1<LE1<GD1(V	1<D P:@89300057
T8U8D8@GX9=¬X&+¬	X9=*				L -89300058
T+X :""""""""""	""""""""""""""""	""""""""""""""""	""""""""""""""""	""""""""""""""""	"""@ L0489300059
T+XA5""""""""""	""""""""""""""""	""""""""""""""""	""""""""""""""""	""""""""""""""""	"""@ 08M89300060
T+XB0""""""""""	""""""""""""""""	""""""""""""""""	""""""""""""""""	""""""""""""""""	"""@ 1Y*89300061
T+XC,""""""""""	""""""""""""""""	""""""""""""""""	""""""""""""""""	""""""""""""""""	"""@ PQM89300062
TD7C""""""""""	"""""""""""""""@				0&889300063
E"""'*E7*=¬DC"PH$	='7M&F| | C F% ASC R A S0 Q			09320608730	626753.&89300064

LAST PAGE

8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                                2         DECK  4
                                3         SEQ   0
   0A00                         4 HXYX    START X'0A00'
                                5         TREP
   0A00 8943            0A01    6         DC    XL2'8943'
   0A02 00              0A02    7         DC    XL1'0'
   0A03 00              0A03    8 PRTN    DC    XL1'0'
   0A04 0000            0A05    9         DC    XL2'0'
   0A06 0A0D            0A07   10         DC    AL2(RTN01)
   0A08 FFFF            0A09   11         DC    XL2'FFFF'
   0A0A 895000          0A0C   12 LINES  DC    XL3'895000'
                               13
                               13
                        0058   14 NOTRDY EQU   X'58'          TIO NOT READY
                        005D   15 ATTCHK EQU   X'5D'          TIO ATTACH CHECK
                        0058   16 SIOI   EQU   X'58'          SIO IMMEDIATE
                        0001   17 XR1    EQU   1
                        0002   18 XR2    EQU   2
                        0008   19 ARR    EQU   8
                        0004   20 PSR    EQU   4
                        00A0   21 IAR2   EQU   X'A0'
                        0222   22 HALT   EQU   X'222'
                        021A   23 PRINT  EQU   X'21A'
                        021E   24 UNPACK EQU   X'21E'
                        0212   25 TEST   EQU   X'212'
                        008C   26 CAR    EQU   X'8C'
                        008A   27 TAR    EQU   X'8A'
                        0089   28 SAR    EQU   X'89'
                        008B   29 STATUS EQU   X'8B'
                        008A   30 BUSY   EQU   X'8A'
                        008A   31 XMITR  EQU   X'8A'
                        0002   32 ENINTR EQU   X'02'
                        00C0   33 ENABLE EQU   X'C0'
                        0088   34 CNTRL  EQU   X'88'
                        0088   35 NORDUC EQU   X'88'
                        0058   36 CTRSTG EQU   X'58'
                        0008   37 OPT3   EQU   X'08'
                        0010   38 OPT4   EQU   X'10'
                        0020   39 OPT5   EQU   X'20'
                        0208   40 SBYTE0 EQU   X'208'         SSW 10-17
                        020A   41 SBYTE2 EQU   X'20A'         SSW 18-1F
                        0208   42 SBYTE3 EQU   X'208'         SSW 20-27
                        020C   43 SBYTE4 EQU   X'20C'         SSW 28-2F
                        020D   44 SBYTE5 EQU   X'20D'
                        0216   45 LINK   EQU   X'216'
                        022A   46 LOAD   EQU   X'22A'
                        0040   47 SSW01  EQU   X'40'
                        0080   48 SSW10  EQU   X'80'
                        0040   49 SSW11  EQU   X'40'
                        0020   50 SSW12  EQU   X'20'
                        0010   51 SSW13  EQU   X'10'
                        0008   52 SSW14  EQU   X'08'
                        0004   53 SSW15  EQU   X'04'
                        0080   54 SSW20  EQU   X'80'
                        0040   55 SSW21  EQU   X'40'
                        0020   56 SSW22  EQU   X'20'
                        0010   57 SSW23  EQU   X'10'
                        0008   58 SSW24  EQU   X'08'
                        0004   59 SSW25  EQU   X'04'
                        0002   60 SSW26  EQU   X'02'
                        0001   61 SSW27  EQU   X'01'
                        0080   62 SSW28  EQU   X'80'
                        0001   63 SSW2F  EQU   X'01'
                        0004   64 UNX    EQU   X'04'
                        0020   65 RVIS   EQU   X'20'
                        0040   66 EOTC   EQU   X'40'
                        000C   67 UNK    EQU   X'0C'
                        0010   68 INCOR  EQU   X'10'
```

S P
E R
C E
T F
I A
O C
N E

DATE 26JUN75 25OCT75 15JAN76 14MAY76
EC NO. 825023 825032 825034 825035

8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                        0013   69 ACCIN  EQU   X'13'
                        0002   70 BUSE   EQU   X'02'
                        000A   71 ATNR   EQU   X'0A'
                        000B   72 WACKE  EQU   X'0B'
                        0008   73 DATER  EQU   X'08'
                        0009   74 DEVHB  EQU   X'09'
                        0001   75 UNITCH EQU   X'01'
                        0003   76 INPN   EQU   X'03'
                        0005   77 ATTCH  EQU   X'05'
                        0006   78 ITBE   EQU   X'06'
                        0007   79 NOINT  EQU   X'07'
                        0014   80 NOEOT  EQU   X'14'
                        0015   81 BDST   EQU   X'15'
                        0016   82 MPINT  EQU   X'16'
                        0017   83 MPCS   EQU   X'17'
                        0018   84 RNST   EQU   X'18'
                        000F   85 MNL    EQU   X'0F'
                               86
                               86
                               87 *  SSW 10 ON = SELECT DEVICES FROM SWITCHES
                               88 *  SSW 11 ON = DO ROUTINE 01 COMPLETELY ON SYSTEM RESET/START
                               89 *  SSW 12 ON = HOLD TEST PATTERN INDEFINITELY
                               90 *  SSW 13 ON = SEL PEN, BUT NO KEYBOARD
                               91 *  SSW 14 ON = NO KEYBOARD OR SELECTOR PEN
                               92 *  SSW 15 ON = GET SINGLE CHAR. FOR ROUTINE 4 FROM CONSOLE SWITCHES
                               93 *
                               94 *  SSW 20 ON = DO ONLY SELECTED TEST PATTERNS AS DETERMINED BY SSW
                               95 *              21 THRU 26 AS FOLLOWS:
                               96 *  SSW 21 ON = DO TEST PATTERN 1 IF SSW 20 IS ON
                               97 *  SSW 22 ON = DO TEST PATTERN 2 IF SSW 20 IS ON
                               98 *  SSW 23 ON = DO TEST PATTERN 3 IF SSW 20 IS ON
                               99 *  SSW 24 ON = DO TEST PATTERN 4 IF SSW 20 IS ON
                              100 *  SSW 25 ON = DO TEST PATTERN 5 IF SSW 20 IS ON
                              101 *  SSW 26 ON = DO TEST PATTERN 6 IF SSW 20 IS ON
                              102 *  SSW 27 ON = SKIP FULL BUFFER PRINT OUT IN RTN 03, 04
                              103 *  SSW 28 ON = ON A MODEL 4 ONLY, DEVICE 40 IS NOT A MODEL 1 3277
                              104 *              WITH NO KEYBOARD (CONSOLE).
                              105
                              106 ********************************************************************************
                              107 *      ROUTINE 01 SERVES A DUAL PURPOSE.  DURING THE FIRST PASS, ALL           *
                              108 *      CONFIGURED OR SELECTED DEVICES ARE POLLED TO SEE IF THEY ARE            *
                              109 *      THERE AND ANSWERING A POLL.  A LIST OF ALL CONFIGURED OR SEL-           *
                              110 *      ECTED DEVICES IS THEN PRINTED OUT FOR THE CE TELLING WHICH              *
                              111 *      DEVICES ARE AVAILABLE.  AN FF HALT THEN OCCURS.                         *
                              112 *      ON ALL SUCEEDING PASSES, ROUTINE 01 UPDATES THE SELECTED                *
                              113 *      DEVICE TO THE NEXT AVAILABLE DEIVCE TILL ALL DEVICES ARE                *
                              114 *      DONE.  THE SECTION IS THEN TERMINATED.                                  *
                              115 ********************************************************************************
                              116
   0A0D 01              0A0D  117 RTN01  DC    XL1'01'
   0A0E 00              0A0E  118        DC    XL1'00'
   0A0F 0CB5            0A10  119        DC    AL2(RTN02)       NEXT ROUTINE
                              120
   0A11 3D 00 260E            121 START  CLI   RESTFL,0         TEST FOR PGM LOOPING
   0A15 F2 01 16              122        JNE   TSSWFL           JUMP IF SO
   0A18 38 40 0208            123        TBN   SBYTE0,SSW01     TEST LOOPING RTN 01
   0A1C F2 10 07              124        JT    LOOPR1           JUMP IF SO
   0A1F 38 40 020A            125        TBN   SBYTE2,SSW11     IS SSW 11 ON
   0A23 F2 90 08              126        JF    TSSWFL           JUMP IF NOT
   0A26 3C FF 3099            127 LOOPR1 MVI   SSWFL,X'FF'      INDICATE SSW 11 WAS SET
   0A2A 3C 00 2629            128        MVI   PASS1,0          RESET PASS 1 FLAG
   0A2E 3D 00 3099            129 TSSWFL CLI   SSWFL,0          WAS SSW 11 OFF LAST TIME THRU?
   0A32 F2 81 08              130        JE    OK               JUMP IF SO
   0A35 3C 00 2629            131        MVI   PASS1,0          SSW 11 WAS ON LAST TIME THRU
   0A39 3C 00 3099            132        MVI   SSWFL,0          RESET THE FLAG
   0A3D 3D 00 2629            133 OK     CLI   PASS1,0          TEST FOR 1ST PASS
   0441 F2 81 13              134        JE    INIT             JUMP IF 1ST PASS
```

DATE 26JUN75 25OCT75 15JAN76 14MAY76
EC NO. 825023 825032 825034 825035

8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0A44 3D 00 260E            135         CLI   RESTFL,0             TEST FOR PGM LOOP
    0A48 C0 01 0CA1            136         BNE   PR1MG                IF SO, GO TO NEXT DEVICE
    0A4C 38 80 020A            137         TBN   SBYTE2,SSW10         GET DEVICES FROM SWITCHES?
    0A50 F2 10 04              138         JT    INIT                 JUMP IF SO
    0A53 C0 87 0C1E            139         B     R1OUT                GO REINITIALIZE
    0A57 38 01 0A0C            140 INIT    TBN   LINES,X'01'          IS KATAKANA FEATURE INSTALLED?
    0A5B C0 90 0A71            141         BF    NOKAT                BRANCH IF NOT
    0A5F 0C 01 2EEA 4181       142         MVC   RIPDT(2),KATD1       MODIFY RIPPLE DATA FOR KATAKANA
    0A65 0C 01 2ED4 4183       143         MVC   RIPDT-22(2),KATD2
    0A6B 0C 00 4173 4181       144         MVC   EXRIPE-3(1),KATD1
    0A71 F3 56 80              145 NOKAT   SIO   X'80',SIOI           DISABLE
    0A74 F3 58 C0              146         SIO   X'C0',SIOI           ENABLE ATTACHMENT
    0A77 30 58 2FF9            147         SNS   WORK,SIOI            SENSE 1ST WORD OF CNTRL STG
    0A7B 0D 01 2FF9 2663       148         CLC   WORK(2),X7200        TEST FOR CORRECT VALUE
    0A81 C0 01 0CAD            149         BNE   MICNL                ERROR IF NOT EQUAL
    0A85 3C 02 2612            150         MVI   BCNT,X'02'           SET UP COUNTER
    0A89 3C F9 2611            151         MVI   BCNT-1,X'F9'
    0A8D 30 58 2FF9            152 MICLP   SNS   WORK,SIOI            SENSE CNTRL STG
    0A91 C1 5D 0CAD            153         TIO   MICNL,ATTCHK         CHECK FOR ATTACHMENT CHECK
    0A95 0E 01 2612 262D       154         ALC   BCNT(2),ONE          INCREMENT COUNTER
    0A9B C0 20 0A8D            155         BNOL  MICLP                LOOP TIL FINISHED
                               156
    0A9F C0 87 19F9            157         B     SETUP                GO DO INITIAL SETUP
    0AA3 C0 87 021A            158         B     PRINT                GO PRINT HEADING
    0AA7 01               0AA7 159         DC    XL1'01'
    0AA8 22               0AA8 160         DC    IL1'34'
    0AA9 2680             0AAA 161         DC    AL2(HEAD1A)
    0AAB 3C 01 2607            162         MVI   LINE,X'01'           INITIALIZE
    0AAF 0C 01 2605 265F       163         MVC   CURDEV(2),STDEV
    0AB5 3C 00 260F            164         MVI   DONE,0
    0AB9 0C 01 1960 2609       165         MVC   RINXR2+3(2),INXR2    SET UP XR2 START ADDRESS
                               166
                          0AC3 167         USING CLSET,XR1
    0ABF C2 01 0AC3            168         LA    CLSET,XR1
    0AC3 5F 03 5B 5B           169 CLSET   SLC   SET(4,XR1),SET(,XR1)  CLEAR THE SET AREA
    0AC7 7C 1C 5B              170         MVI   SET(,XR1),X'1C'      SET 1ST 3 BITS USED
    0ACA 0F 03 260D 260D       171         SLC   ONFLG(4),ONFLG       CLEAR THE ON FLAGS
    0AD0 3C E0 260A            172         MVI   ONFLG-3,X'E0'        FORCE HI 3 BITS ON
    0AD4 5C 01 22 5D           173         MVC   TLIN+3(2,XR1),CONS(,XR1)  INITIALIZE ADDR IN TBN INSTR.
    0AD8 7C 08 1F              174         MVI   TLIN(,XR1),X'08'     SET UP THE STARTING TEST BIT
    0ADB 5C 00 20 1F           175 NEXT    MVC   TLIN+1(1,XR1),TLIN(,XR1)  MOVE TEST BIT TO IMMED. BYTE
    0ADF 7C 38 1F              176 SETTBN  MVI   TLIN(,XR1),X'38'     FORCE TBN OP
                               177
    0AE2 38 00 0000            178 TLIN    TBN   *-*,*-*              TEST LINE INSTALLED
    0AE6 F2 90 05              179         JF    UPL
    0AE9 1E 03 260D 5B         180         ALC   ONFLG,SET(4,XR1)     SET ON FLAGS IF INSTALLED
    0AEE 5E 03 5B 5B           181 UPL     ALC   SET(4,XR1),SET(,XR1)  SHIFT LINES LEFT 3 BITS
    0AF2 5E 03 5B 5B           182         ALC   SET(4,XR1),SET(,XR1)
    0AF6 5E 03 5B 5B           183         ALC   SET(4,XR1),SET(,XR1)
    0AFA 78 E0 58              184         TBN   SET-3(,XR1),X'E0'    ARE WE DONE YET
    0AFD F2 10 21              185         JT    TSSW                 JUMP IF SO
    0B00 7C 02 1F              186         MVI   TLIN(,XR1),X'02'     PLUG IN SHIFT STOPPER
    0B03 5E 01 20 20           187 SHIFT   ALC   TLIN+1(2,XR1),TLIN+1(,XR1)  SHIFT LINE RIGHT ONE BIT
    0B07 C0 20 0B03            188         BNOL  SHIFT
    0B0B 78 80 20              189         TBN   TLIN+1(,XR1),X'80'   DID WE JUST GO TO NEXT BYTE
    0B0E C0 90 0ADB            190         BF    NEXT
    0B12 4E 01 22 262D         191         ALC   TLIN+3(2,XR1),ONE    INCREMENT THE TEST ADDR
    0B17 C0 87 0ADF            192         B     SETTBN               GO SET TBN
                               193
    0B1B 00000000         0B1E 194 SET     DC    XL4'0'               SET BIT MASK
    0B1F 0A0B             0B20 195 CONS    DC    AL2(LINES-1)         ADDR OF OPTION BITS
                               196
    0B21 38 80 020A            197 TSSW    TBN   SBYTE2,SSW10         TEST DEVICES SELECTED BY SSW
    0B25 C0 90 0BF6            198         BF    DONXT                JUMP IF NOT
                               199
    0B29 C0 87 021A            200 GETDEV  B     PRINT                PRINT MESSAGE
    0B2D 01               0B2D 201         DC    XL1'01'
    0B2E 4E               0B2E 202         DC    IL1'78'
```


8943 DA FUNCTIONAL TESTS

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0B2F 305B             0B30 203         DC    AL2(SETMG1)
    0B31 C0 87 021A            204         B     PRINT
    0B35 06               0B35 205         DC    XL1'06'
    0B36 22               0B36 206         DC    IL1'34'
    0B37 307D             0B38 207         DC    AL2(SETMG2)
    0B39 3C 00 2629            208         MVI   PASS1,0              SET PASS 1 INDICATION
    0B3D 0F 03 260D 260D       209         SLC   ONFLG(4),ONFLG       RESET ALL ON FLAGS
    0B43 3C F0 0B4C            210 SETF0   MVI   DEVHC,X'F0'          SET FOR HALT F0
    0B47 C0 87 0222            211 DEVHLT  B     HALT                 HALT TO SET SWITCHES
    0B4B 89F0             0B4C 212 DEVHC   DC    XL2'89F0'            HALT F0/F1
    0B4D 30 00 2FFC            213         SNS   TCOUNT,X'00'         READ THE CONSOLE SWITCHES
    0B51 38 FF 2FFC            214         TBN   TCOUNT,X'FF'         TEST FOR END OF LIST
    0B55 F2 10 9E              215         JT    DONXT                OUT IF SO
    0B58 39 20 2FFC            216         TBF   TCOUNT,X'20'         BIT 2 MUST BE OFF
    0B5C 38 40 2FFC            217         TBN   TCOUNT,X'40'         BIT 1 MUST BE ON
    0B60 F2 90 87              218         JF    INV                  INVALID IF NOT
    0B63 0C 00 2FF9 2FFC       219         MVC   WORK(1),TCOUNT       MOVE ADDRESS TO WORK
    0B69 3B F0 2FF9            220         SBF   WORK,X'F0'           SET HI BITS OFF
    0B6D 3C 01 2FF8            221         MVI   WORK-1,1             INITIALIZE POINTER TO 1
    0B71 3C 07 0BA3            222         MVI   TADD+1,7             START TEST AT 7
    0B75 39 8F 2FFC            223         TBF   TCOUNT,X'8F'         TEST FOR 40 OR 50
    0B79 F2 10 1B              224         JT    DOK                  OKAY IF SO
    0B7C 38 80 2FFC            225         TBN   TCOUNT,X'80'         TEST DEVICE HI BITS = C OR D
    0B80 3D 09 2FF9            226         CLI   WORK,9               TEST LO BITS OVER 9
    0B84 F2 10 06              227         JT    CORD                 JUMP IF HI BITS = C OR D
    0B87 F2 04 60              228         JNH   INV                  JUMP IF LO BITS NOT OVER 9
    0B8A F2 87 0A              229         J     DOK
    0B8D F2 84 5A              230 CORD    JH    INV                  ERROR IF LO BITS OVER 9
    0B90 39 0F 2FFC            231         TBF   TCOUNT,X'0F'         TEST LO BITS C
    0B94 F2 10 53              232         JT    INV                  INVALID IF SO
    0B97 3B F8 2FF9            233 DOK     SBF   WORK,X'F8'           SET HI BITS OFF
                               234
    0B9B 38 5E 2FFC            235         TBN   TCOUNT,X'5E'         TEST DEVICE 5E OR 5F
    0B9F F2 10 48              236         JT    INV                  INVALID IF SO
    0BA2 3D 00 2FF9            237 TADD    CLI   WORK,*-*             TEST 3 BITS IN WORK
    0BA6 F2 81 10              238         JE    FND                  JUMP IF EQUAL
    0BA9 0F 00 0BA3 262D       239         SLC   TADD+1(1),ONE        CHANGE COMPARE BYTE
    0BAF 0E 00 2FF8 2FF8       240         ALC   WORK-1(1),WORK-1     SHIFT BIT LEFT 1
    0BB5 C0 87 0BA2            241         B     TADD                 LOOP
    0BB9 C2 01 260A            242 FND     LA    ONFLG-3,XR1          GET ADDRESS OF ON FLGS
    0BBD 38 10 2FFC            243         TBN   TCOUNT,X'10'         TEST BIT 3 ON
    0BC1 F2 90 03              244         JF    NOTD5                JUMP IF HI BITS = 4 OR C
    0BC4 D2 01 02              245         LA    2(,XR1),XR1          INCREMENT BYTE POINTER
    0BC7 38 08 2FFC            246 NOTD5   TBN   TCOUNT,X'08'         TEST BIT 4 ON
    0BCB F2 90 03              247         JF    NOT8F                JUMP IF LO BITS = 0-7
    0BCE D2 01 01              248         LA    1(,XR1),XR1
    0BD1 0C 00 0BD8 2FF8       249 NOT8F   MVC   SETFL+1(1),WORK-1    SET MASK
    0BD7 7A 00 00              250 SETFL   SBN   0(,XR1),*-*          SET BIT IN ON FLAGS
    0BDA 38 01 0B4C            251         TBN   DEVHC,X'01'          TEST HALT F1
    0BDE C0 10 0B43            252         BT    SETF0                IF SO CHANGE TO HALT F0
    0BE2 3C F1 0B4C            253         MVI   DEVHC,X'F1'          CHANGE TO HALT F1
    0BE6 C0 87 0B47            254         B     DEVHLT               GO GET NEXT ENTRY
    0BEA C0 87 021A            255 INV     B     PRINT                PRINT INVLAID DEVICE
    0BEE 06               0BEE 256         DC    XL1'06'
    0BEF 1A               0BEF 257         DC    IL1'26'
    0BF0 3097             0BF1 258         DC    AL2(INVMG)
    0BF2 C0 87 0B47            259         B     DEVHLT               GO HALT AGAIN FOR NEXT
                               260
    0BF6 C0 87 1959            261 DONXT   B     UPDATE               GO SET UP FOR DEVICE TO BE POLLED
    0BFA 3D 00 260F            262         CLI   DONE,0               TEST ALL DONE
    0BFE F2 01 1D              263         JNE   R1OUT                EXIT IF DONE
                               264
    0C01 C0 87 1C39            265 POLL1   B     DOPOL                GO POLL THE DEVICE
    0C05 38 10 2658            266         TBN   POLFLG,X'10'         WAS STATUS RECEIVED?
    0C09 F2 10 82              267         JT    CHKST                GO CHECK IF SO
    0C0C 0C 01 2B0F 25CF       268 AVAIL   MVC   DEVMG(2),DEVICE      PUT DEVICE IN PRINTOUT
    0C12 C0 87 021A            269         B     PRINT
    0C16 02               0C16 270         DC    XL1'02'
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0C17 13               0C17  271        DC    IL1'19'
   0C18 2B19             0C19  272        DC    AL2(AVALMG)
                               273
   0C1A C0 87 0BF6             274        B     DONXT              GO DO NEXT DEVICE
                               275
   0C1E 0C 01 2605 265F        276 R1OUT  MVC   CURDEV(2),STDEV    REINITIALIZE
   0C24 3C 01 2607             277        MVI   LINE,X'01'
   0C28 0C 01 1960 2609        278        MVC   RINXR2+3(2),INXR2  SET UP XR2 START ADDRESS
   0C2E 3C 00 260F             279        MVI   DONE,0
   0C32 3D 00 2629             280        CLI   PASS1,0            IS IT THE 1ST PASS?
   0C36 3C FF 2629             281        MVI   PASS1,X'FF'        SET PASS 1 COMPLETED FLAG
   0C3A F2 01 37               282        JNE   SKIP1              JUMP IF NOT 1ST PASS
                               283
   0C3D C0 87 021A             284        B     PRINT              PRINT MESSAGE & HALT
   0C41 41               0C41  285        DC    XL1'41'
   0C42 56               0C42  286        DC    IL1'86'
   0C43 2C5A             0C44  287        DC    AL2(RT1MG1)
   0C45 89FF             0C46  288        DC    XL2'89FF'
   0C47 C0 87 021A             289        B     PRINT
   0C4B 01               0C4B  290        DC    XL1'01'
   0C4C 50               0C4C  291        DC    IL1'80'
   0C4D 2CAA             0C4E  292        DC    AL2(RT1MG2)
   0C4F C0 87 021A             293        B     PRINT
   0C53 01               0C53  294        DC    XL1'01'
   0C54 47               0C54  295        DC    IL1'71'
   0C55 2CF1             0C56  296        DC    AL2(RT1MG3)
   0C57 C0 87 021A             297        B     PRINT
   0C5B 06               0C5B  298        DC    XL1'06'
   0C5C 4F               0C5C  299        DC    IL1'79'
   0C5D 2D40             0C5E  300        DC    AL2(RT1MG)
   0C5F 38 40 0208             301        TBN   SBYTE0,SSW01       TEST LOOP ROUTINE SSW ON
   0C63 F2 90 04               302        JF    RT1HLT             HALT IF NOT
   0C66 C0 87 0216             303        B     LINK               NO HALT IF SSW 01 IS ON
   0C6A C0 87 0222             304 RT1HLT B     HALT               HALT ******FF******
   0C6E 89FF             0C6F  305        DC    XL2'89FF'
   0C70 3B C0 020A             306        SBF   SBYTE2,SSW10+SSW11 RESET SSW 10 AND 11
                               307
   0C74 C0 87 1959             308 SKIP1  B     UPDATE             STEP TO NEXT DEVICE
   0C78 3C 00 260E             309        MVI   RESTFL,0           RESET PGM LOOP FLAG
   0C7C 3D 00 260F             310        CLI   DONE,0             ARE WE DONE?
   0C80 C0 81 0216             311        BE    LINK               GO TO ROUT. 2 IF NOT
   0C84 C0 87 021A             312 TERM   B     PRINT              GO SPACE
   0C88 16               0C88  313        DC    XL1'16'
   0C89 C0 87 022A             314        B     LOAD               TERMINATE THIS PGM.
   0C8D 00               0C8D  315        DC    XL1'00'
                               316
   0C8E 39 12 265B             317 CHKST  TBF   POLST,X'12'        ARE IR AND CC OFF IN STATUS
   0C92 C0 10 0C0C             318        BT    AVAIL              SET AVAILABLE IF SO
   0C96 BB 00 00               319 SF1    SBF   0(,XR2),*-*        RESET THE ON BIT FOR THIS DEVICE
   0C99 C0 87 1D27             320        B     FORMAT             GO PRINT STATUS
   0C9D C0 87 0BF6             321        B     DONXT              GO TO NEXT DEVICE
   0CA1 C0 87 021A             322 PRTMG  B     PRINT              GO PRINT HEADING
   0CA5 01               0CA5  323        DC    XL1'01'
   0CA6 16               0CA6  324        DC    IL1'22'
   0CA7 26C6             0CA8  325        DC    AL2(HEAD1B)
   0CA9 C0 87 0C74             326        B     SKIP1
                               327
   0CAD 3C 0F 262A             328 MICNL  MVI   ERR,MNL           SET MICRO CODE NOT LOADED
   0CB1 C0 87 22A7             329        B     ERROR
                               330 ***************************************************************
                               331 *      THIS ROUTINE WRITES THE DEVICE ADDRESS TO THE DEVICE BUFFER   *
                               332 *      USING THE ERASE/WRITE COMMAND.  A READ BUFFER OPERATION IS THEN*
                               333 *      DONE.  FROM THE INFORMATION, THUS OBTAINED, A MESSAGE IS PRINT-*
                               334 *      ED TELLING THE DEVICE TYPE (DISPLAY OR PRINTER) AND THE MODEL. *
                               335 *      THIS INFORMATION IS USED IN ALL FURTHER ROUTINES.  WHEN SEL-   *
                               336 *      ECTING ROUTINES, CARE MUST BE TAKEN TO BE SURE ROUTINE 2 HAS   *
                               337 *      BEEN RUN FOR THAT DEVICE.                                      *
                               338 ***************************************************************
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                               339
   0CB5 02               0CB5  340 RTN02  DC    XL1'02'
   0CB6 00               0CB6  341        DC    XL1'0'
   0CB7 0D6D             0CB8  342        DC    AL2(RTN03)
                               343
   0CB9 C0 87 021A             344        B     PRINT              GO PRINT HEADING
   0CBD 01               0CBD  345        DC    XL1'01'
   0CBE 29               0CBE  346        DC    IL1'41'
   0CBF 26EF             0CC0  347        DC    AL2(HEAD2)
   0CC1 C0 87 19F9             349        B     SETUP              GO DO INITIAL SETUP
   0CC5 3C 00 2FFD             349        MVI   RTNFLG,0           RESET ROUTINE FLAGS
   0CC9 C0 87 1C9A             350        B     SELECT             GO SELECT DEVICE
   0CCD 0C 01 2D6E 25CF        351        MVC   DEVRT2(2),DEVICE   SET UP MESSAGE TO XMIT
   0CD3 3C 60 3098             352        MVI   NOAID,X'60'        SET DISPLAY NO AID CHAR
   0CD7 0C 01 37E7 25CF        353        MVC   MODMG1(2),DEVICE   PUT DEVICE IN MESSAGE
   0CDD 3C F1 37F4             354        MVI   MODMG2,C'1'        SET MODEL 1 IN MESSAGE
   0CE1 0C 06 37FC 380A        355        MVC   MODMG3(7),DISPLY   SET DISPLAY IN MESSAGE
                               356
   0CE7 C0 87 1AB4             357        B     DOSIO              GO DO ERASE WRITE PUT DEVICE
   0CEB 0010             0CEC  358        DC    AL2(EWRT2-WRTRT2)    ADDRESS ON SCREEN
   0CED 431F             0CEE  359        DC    AL2(XMITE)
   0CEF 2D72             0CF0  360        DC    AL2(EWRT2)
                               361
   0CF1 4D 01 01 263F          362        CLC   1(2,XR1),ACK1      CHECK FOR CORRECT RESPONSE
   0CF6 F2 81 34               363        JE    READ2
   0CF9 4D 01 01 2639          364        CLC   1(2,XR1),WACK      MAYBE IT WAS A PRINTER
   0CFE F2 81 52               365        JE    SPB                IF SO, GO SET PRINTER BIT
   0D01 4D 01 01 2637          366        CLC   1(2,XR1),EOT       WAS RESPONSE EOT?
   0D06 F2 01 0C               367        JNE   SETIN              JUMP IF NOT
   0D09 3C 40 262A             368        MVI   ERR,EOTC           SET ERROR
   0D0D C0 87 22A7             369        B     ERROR
   0D11 C0 87 1CDB             370        B     FETCHS             GO GET THE STATUS
                               371
   0D15 C0 87 1FD5             372 SETIN  B     FILLFF             GO FILL EXP BUFF WITH FF
   0D19 0C 10 2D83 2D72        373        MVC   EXPBUF+16(17),EWRT2  SET UP EXP DATA
   0D1F 0C 01 2D85 263F        374        MVC   EXPBUF+18(2),ACK1
   0D25 3C 10 262A             375        MVI   ERR,INCOR          SET INCORRECT RESPONSE
   0D29 C0 87 22A7             376        B     ERROR              GO TO ERROR ROUTINE
                               377
   0D2D C0 87 1DBB             378 READ2  B     READBF             GO READ THE BUFFER
   0D31 80               0D31  379        DC    XL1'80'            EXPECT NULLS
   0D32 4040             0D33  380        DC    XL2'4040'          CURSOR AT ZERO
                               381
   0D34 3D 02 2FFC             382        CLI   TCOUNT,2           TEST TRANSMISSION COUNT
   0D38 F2 81 08               383        JE    MOD1               IS MOD 1 IF COUNT WAS 2
   0D3B 3A 80 2FFD             384        SBN   RTNFLG,X'80'       SET MODEL 2 FLAG ON
   0D3F 3C F2 37F4             385        MVI   MODMG2,C'2'        SET MODEL 2 IN MESSAGE
   0D43 C0 87 021A             386 MOD1   B     PRINT              GO PRINT MESSAGE
   0D47 03               0D47  387        DC    XL1'03'
   0D48 37               0D48  388        DC    IL1'55'
   0D49 37FC             0D4A  389        DC    AL2(MODMG3)
   0D4B 3C FF 2660             390        MVI   CONFLG,X'FF'       SET CONFIG FLAG FOR THIS DEVICE
   0D4F C0 87 0216             391        B     LINK               GO TO NEXT ROUTINE
   0D53 3A 40 2FFD             392 SPB    SBN   RTNFLG,X'40'       SET PRINTER FLAG ON
   0D57 0C 06 37FC 3803        393        MVC   MODMG3(7),PRINTR   SET PRINTER IN MESSAGE
   0D5D 3C E8 3098             394        MVI   NOAID,X'E8'        SET PRINTER NO AID CHAR
   0D61 C0 87 215E             395        B     WAITPB             WAIT FOR BUSY TO DROP
   0D65 C0 87 1C9A             396        B     SELECT             GO RESELECT THE PRINTER
   0D69 C0 87 0D2D             397        B     READ2              GO READ THE BUFFER
                               398 ***************************************************************
                               399 *      THIS ROUTINE WRITES A RIPPLE PATTERN TO THE BUFFER.  THIS DATA *
                               400 *      IS WRITTEN ONLY 80 CHARACTERS AT A TIME SO THAT THE BUFFER     *
                               401 *      ADDRESS DURING CHAINED OPERATIONS IS CHECKED.                  *
                               402 *      A READ BUFFER COMMAND IS USED TO CHECK THE CONTENTS OF THE     *
                               403 *      BUFFER AFTER IT IS FILLED.                                     *
                               404 ***************************************************************
                               405
   0D6D 03               0D6D  406 RTN03  DC    XL1'03'            START OF ROUTINE 03
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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0D6E 00               0D6E  407         DC    XL1'00'
   0D6F 0E15             0D70  408         DC    AL2(RTN04)
                               409
   0D71 C0 87 021A             410         B     PRINT                  GO PRINT HEADING
   0D75 01               0D75  411         DC    XL1'01'
   0D76 19               0D76  412         DC    IL1'25'
   0D77 2708             0D78  413         DC    AL2(HEAD3)
   0D79 C0 87 19F9             414         B     SETUP                  GO DO HOUSEKEEPING
   0D7D C0 87 1C9A             415         B     SELECT                 GO SELECT THE DEVICE
   0D81 0C 01 30AB 25CF        416         MVC   DEVRT3-2(2),DEVICE     INSERT DEVICE
   0D87 0C 3F 30EF 2EEA        417         MVC   WRTR3R(64),RIPDT       PLUG IN DATA
   0D8D 3C 40 309D             418         MVI   RT3CW,X'40'            INSERT DO NOTHING WCC
   0D91 3C F5 309C             419         MVI   RT3CW-1,X'F5'          FORCE CMD TO ERASE WRITE
   0D95 0C 11 2EAA 30AF        420         MVC   RIPHD(18),RT3HD        PUT HEADING IN RIPPLE DATA
   0D9B 3C 61 2FFB             421         MVI   ACK,X'61'              START WITH ACK 1
   0D9F 3C 01 2FFC             422         MVI   TCOUNT,1               INITIALIZE COUNT TO 1
                               423
   0DA3 C0 87 1AB4             424 WRTR3A  B     DOSIO                  GO WRITE PATTERN
   0DA7 0056             0DA8  425         DC    AL2(EWRT3-WRTR3)
   0DA9 431F             0DAA  426         DC    AL2(XMITE)
   0DAB 30F0             0DAC  427         DC    AL2(EWRT3)
                               428
   0DAD C0 87 211C             429         B     TRESPX                 GO TEST RESPONSE FOR CORRECT ACK
                               430
   0DB1 3D 70 2FFB             431 R3NXT   CLI   ACK,X'70'              TEST FOR ACK 0
   0DB5 3C 61 2FFB             432         MVI   ACK,X'61'              SET ACK 1
   0DB9 F2 81 04               433         JE    WASAO                  JUMP IF IT WAS ACK 0
   0DBC 3C 70 2FFB             434         MVI   ACK,X'70'              FORCE ACK 0
   0DC0 3C F1 309C             435 WASAO   MVI   RT3CW-1,X'F1'          CHANGE CMD TO WRITE
   0DC4 3D 40 309D             436         CLI   RT3CW,X'40'            WERE WE DOING LAST XMIT?
   0DC8 F2 01 31               437         JNE   R3PTR                  JUMP IF SO
   0DCB 38 80 2FFD             438         TBN   RTNFLG,X'80'           TEST FOR DEVICE = MODEL 2
   0DCF F2 10 0A               439         JT    R3M2                   JUMP IF SO
   0DD2 3D 05 2FFC             440         CLI   TCOUNT,5               MODEL 1, NEXT TO LAST XMIT?
   0DD6 F2 81 0A               441         JE    R3WPR                  JUMP IF SO
   0DD9 F2 87 16               442         J     UPTCNT
   0DDC 3D 17 2FFC             443 R3M2    CLI   TCOUNT,23              MODEL 2, NEXT TO LAST XMIT?
   0DE0 F2 01 0F               444         JNE   UPTCNT                 JUMP IF NOT
   0DE3 3C C2 309D             445 R3WPR   MVI   RT3CW,X'C2'            FORCE DIFF. WCC FOR LAST XMIT
   0DE7 38 01 020C             446         TBN   SBYTE4,SSW27           TEST FOR SKIPPING FULL BUFFER PRINT
   0DEB F2 10 04               447         JT    UPTCNT                 JUMP IF SO
   0DEE 3C 7A 309D             448         MVI   RT3CW,X'7A'            SET START PRINT BIT ON LAST XMIT
   0DF2 0E 00 2FFC 262D        449 UPTCNT  ALC   TCOUNT(1),ONE           INCREMENT TRANSMISSION COUNT
   0DF8 C0 87 0DA3             450         B     WRTR3A                 GO WRITE NEXT PATTERN
                               451
   0DFC 38 40 2FFD             452 R3PTR   TBN   RTNFLG,X'40'           TEST FOR DEVICE = PRINTER
   0E00 F2 90 07               453         JF    READ3
   0E03 C0 87 1C9A             454         B     SELECT                 RESELECT IT
   0E07 F2 87 00               455         J     READ3                  GO READ BUFFER
                               456
   0E0A C0 87 1DB8             457 READ3   B     READBF                 GO READ AND CHECK BUFFER
   0E0E 40               0E0E  458         DC    XL1'40'                USE RIPPLE PATTERN
   0E0F 4040             0E10  459         DC    XL2'4040'              CURSOR IS AT ZERO
                               460
   0E11 C0 87 0216             461         B     LINK                   GO TO NEXT ROUTINE
                               462 ********************************************************************************
                               463 *      THIS ROUTINE WRITES A SINGLE CHARACTER OVER THE ENTIRE SCREEN  *
                               464 *      USING THE REPEAT TO ADDRESS OPTION.  UNLESS THE CHARACTER IS   *
                               465 *      GOTTEN FROM THE SWITCHES, AN '*' IS USED.                      *
                               466 ********************************************************************************
                               467
   0E15 04               0E15  468 RTN04   DC    XL1'04'                START OF ROUTINE 04
   0E16 00               0E16  469         DC    XL1'00'
   0E17 0E86             0E18  470         DC    AL2(RTN05)
                               471
   0E19 C0 87 021A             472         B     PRINT                  GO PRINT HEADING
   0E1D 01               0E1D  473         DC    XL1'01'
   0E1E 1E               0E1E  474         DC    IL1'30'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E1F 2726             0E20  475         DC    AL2(HEAD4)
   0E21 38 04 020A             476         TBN   SBYTE2,SSW15           TEST SSW 15 ON
   0E25 3C 5C 3812             477         MVI   RPTCH,C'*'             DEFAULT TO *
   0E29 F2 90 20               478         JF    USEAST                 USE CHARACTER * IF NOT
   0E2C C0 87 021A             479         B     PRINT                  GO PRINT MESSAGE
   0E30 01               0E30  480         DC    XL1'01'
   0E31 42               0E31  481         DC    IL1'66'
   0E32 2ACE             0E33  482         DC    AL2(RO4MG)
   0E34 C0 87 021A             483         B     PRINT
   0E38 06               0E38  484         DC    XL1'06'
   0E39 30               0E39  485         DC    IL1'48'
   0E3A 2AFE             0E3B  486         DC    AL2(RO4MG2)
   0E3C C0 87 0222             487         B     HALT                   GO HALT TIL CHAR SET
   0E40 89F3             0E41  488         DC    XL2'89F3'              HALT - F3 -
                               489
   0E42 30 00 2FFC             490         SNS   TCOUNT,X'00'           READ THE SWITCHES
   0E46 0C 00 3812 2FFC        491         MVC   RPTCH(1),TCOUNT        MOVE IN THE CHARACTER
   0E4C C0 87 19F9             492 USEAST  B     SETUP                  GO DO INITIAL HOUSEKEEPING
   0E50 C0 87 1C9A             493         B     SELECT                 GO SELECT THE DEVICE
   0E54 3C 4A 380E             494         MVI   R4WRT+3,X'4A'          SET UP TO PRINT
   0E58 38 01 020C             495         TBN   SBYTE4,SSW27           TEST FOR SKIP FULL BUFFER PRINT
   0E5C F2 90 04               496         JF    R4WRT1                 SKIP IF NOT
   0E5F 3C 40 380E             497         MVI   R4WRT+3,X'40'          FORCE NO PRINT IN PRINTERS
   0E63 C0 87 1AB4             498 R4WRT1  B     DOSIO                  GO WRITE SINGLE CHARACTER
   0E67 000C             0E68  499         DC    AL2(R4WRTE-R4WRT)
   0E69 431F             0E6A  500         DC    AL2(XMITE)
   0E6B 3817             0E6C  501         DC    AL2(R4WRTE)
                               502
   0E6D C0 87 2118             503         B     TRESP1                 GO TEST FOR ACK 1 RETURNED
   0E71 C0 87 1C9A             504         B     SELECT                 GO RESELECT
   0E75 0C 00 3818 3812        505         MVC   SINCHR-1(1),RPTCH      FILL IN THE REPEAT CHAR. USED
   0E7B C0 87 1DBB             506         B     READBF                 GO READ THE BUFFER
   0E7F 20               0E7F  507         DC    XL1'20'
   0E80 C75F             0E81  508         DC    XL2'C75F'
                               509
   0E82 C0 87 0216             510         B     LINK
                               511 ********************************************************************************
                               512 *      THIS ROUTINE CHECKS THE READ MODIFIED OPERATION.                *
                               513 ********************************************************************************
                               514
   0E86 05               0E86  515 RTN05   DC    XL1'05'                START OF ROUTINE 05
   0E87 00               0E87  516         DC    XL1'00'
   0E88 0EFA             0E89  517         DC    AL2(RTN06)
                               518
   0E8A C0 87 021A             519         B     PRINT                  GO PRINT HEADING
   0E8E 01               0E8E  520         DC    XL1'01'
   0E8F 1B               0E8F  521         DC    IL1'27'
   0E90 2741             0E91  522         DC    AL2(HEAD5)
   0E92 C0 87 19F9             523         B     SETUP                  GO DO INITIAL HOUSEKEEPING
   0E96 C0 87 1C9A             524         B     SELECT                 GO SELECT DEVICE
   0E9A 0C 01 3828 25CF        525         MVC   DEVRT5(2),DEVICE       FILL IN DEVICE IN PATTERN
   0EA0 C0 87 1AB4             526         B     DOSIO                  GO WRITE PATTERN TO TEST
   0EA4 002C             0EA5  527         DC    AL2(R5WRTE-R5WRT)      READ MODIFIED
   0EA6 431F             0EA7  528         DC    AL2(XMITE)
   0EA8 3846             0EA9  529         DC    AL2(R5WRTE)
   0EAA C0 87 2118             530         B     TRESP1                 GO TEST ACK 1 RECEIVED
   0EAE C0 87 1C9A             531         B     SELECT                 GO SELECT AGAIN
   0EB2 C0 87 1AB4             532         B     DOSIO                  GO DO READ MODIFIED
   0EB6 0003             0EB7  533         DC    AL2(RDMODE-RDMOD)
   0EB8 431F             0EB9  534         DC    AL2(XMITE)
   0EBA 25FF             0EBB  535         DC    AL2(RDMODE)
                               536
   0EBC C0 87 1FD5             537         B     FILLFF                 GO FILL EXP BUFFER WITH FF
   0EC0 0C 03 2D76 25FF        538         MVC   EXPBUF+3(4),RDMODE     GO SET UP EXPECTED RESULTS
   0EC6 0C 03 2D7A 2E98        539         MVC   EXPBUF+7(4),RBEX1
   0ECC 0C 00 2D7A 3098        540         MVC   EXPBUF+7(1),NOAID      FILL IN NO AID CHAR.
   0ED2 0C 00 2D79 2605        541         MVC   EXPBUF+6(1),CURDEV     FILL IN CURRENT DEVICE
   0ED8 0C 01 2D7C 2651        542         MVC   EXPBUF+9(2),POLL       FILL IN CURSOR ADDRESS
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0EDE 0C 17 2D94 3842       543        MVC   EXPBUF+33(24),R5EXP   FILL IN EXP. MOD. DATA
   0EE4 0C 01 3D7F 39D8       544        MVC   EXPBUF+12(2),X404B   ADJUST ADDRESS
   0EEA 3C 03 2D95            545        MVI   EXPBUF+34,3          FILL IN ETX
                              546
   0EEE C0 87 1F9D            547        B     CHECK1               GO CHECK EXPECTED RESULTS
   0EF2 C0 87 1BC6            548        B     GOACK                GO SEND ACK TO DROP DEVICE
                              549
   0EF6 C0 87 0216            550        B     LINK
                              551 ********************************************************************
                              552 *      THIS ROUTINE CHECKS THE VARIOUS WRITE OPTIONS SUCH AS INSERT  *
                              553 *      CURSOR, REPEAT TO ADDRESS, ERASE UPROTECTED TO ADDRESS, PROGRAM*
                              554 *      TAB, AND SET BUFFER ADDRESS.                                  *
                              555 *      IT THEN TESTS THE ERASE ALL UNPROTECTED COMMAND TO THE DEVICE. *
                              556 ********************************************************************
                              557
   0EFA 06          0EFA      558 RTN06  DC    XL1'06'              START OF ROUTINE 06
   0EFB 00          0EFB      559        DC    XL1'00'
   0EFC 0F64        0EFD      560        DC    AL2(RTN07)
                              561
   0EFE C0 87 021A            562        B     PRINT                GO PRINT HEADING
   0F02 01          0F02      563        DC    XL1'01'
   0F03 25          0F03      564        DC    IL1'37'
   0F04 2766        0F05      565        DC    AL2(HEAD6)
   0F06 C0 87 19F9            566        B     SETUP                GO DO INITIAL HOUSEKEEPING
   0F0A C0 87 1C9A            567        B     SELECT               GO SELECT THE DEVICE
   0F0E 0C 01 3B1F 25CF       568        MVC   RT6DV(2),DEVICE      PUT DEVICE IN PATTERN
   0F14 0C 01 3B94 25CF       569        MVC   R6EDV(2),DEVICE      PUT DEVICE IN EXPECTED RESULTS
                              570
   0F1A C0 87 1AB4            571        B     DOSIO                GO WRITE PATTERN
   0F1E 0053        0F1F      572        DC    AL2(RT6PE-RT6P)
   0F20 431F        0F21      573        DC    AL2(XMITE)
   0F22 3B62        0F23      574        DC    AL2(RT6PE)
   0F24 C0 87 2118            575        B     TRESP1               GO TEST FOR CORRECT RESPONSE
                              576
   0F28 C0 87 1AB4            577        B     DOSIO                GO TEST FUNCTIONS OF WRITE
   0F2C 0024        0F2D      578        DC    AL2(RT6TE-RT6T)
   0F2E 431F        0F2F      579        DC    AL2(XMITE)
   0F30 3B87        0F31      580        DC    AL2(RT6TE)
   0F32 3C 70 2FF8            581        MVI   ACK,X'70'            FORCE ACK 0 EXPECTED
   0F36 C0 87 211C            582        B     TRESPX               GO CHECK FOR ACK 0
                              583
   0F3A C0 87 1DB8            584        B     READBF               GO READ BUFFER
   0F3E 10          0F3E      585        DC    XL1'10'              EXPECT PATTERN 1
   0F3F 40D1        0F40      586        DC    XL2'40D1'            CURSOR ADDRESS
                              587
   0F41 C0 87 1C9A            588        B     SELECT               GO RESELECT THE DEVICE
   0F45 C0 87 1AB4            589        B     DOSIO                GO SEND AN EAU
   0F49 0003        0F4A      590        DC    AL2(EAUE-EAU)
   0F4B 431F        0F4C      591        DC    AL2(XMITE)
   0F4D 400D        0F4E      592        DC    AL2(EAUE)
   0F4F C0 87 2118            593        B     TRESP1               TEST CORRECT RESPONSE
   0F53 C0 87 2272            594        B     DELAY                GIVE IT A CHANCE TO FINISH
   0F57 0064        0F58      595        DC    IL2'100'             WAIT 100 MS
   0F59 C0 87 1DB8            596        B     READBF               NOW GO READ BUFFER TO CHECK
   0F5D 04          0F5D      597        DC    XL1'04'              EXPECT PATTERN 2
   0F5E 4040        0F5F      598        DC    XL2'4040'            CURSOR AT 0
                              599
   0F60 C0 87 0216            600        B     LINK
                              601 ********************************************************************
                              602 *      THIS ROUTINE SENDS INVALID ADDRESSES IN THE WRITE DATA STREAM  *
                              603 *      TO THE DEVICES.  IT THEN CHECKS THAT THE INVALID ADDRESSES     *
                              604 *      HAVE BEEN DETECTED AND RESULT IN OPERATION CHECK STATUS.       *
                              605 *      THE INVALID ADDRESSES USED ARE 1 OVER THE MAXIMUM ADDRESS      *
                              606 *      FOR THE DEVICE BEING TESTED.                                   *
                              607 ********************************************************************
                              608
   0F64 07          0F64      609 RTN07  DC    XL1'07'              START OF ROUTINE 07
   0F65 00          0F65      610        DC    XL1'00'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0F66 0FD0        0F67      611        DC    AL2(RTN08)
                              612
   0F68 C0 87 021A            613        B     PRINT                GO PRINT HEADING
   0F6C 01          0F6C      614        DC    XL1'01'
   0F6D 20          0F6D      615        DC    IL1'32'
   0F6E 2786        0F6F      616        DC    AL2(HEAD7)
   0F70 C0 87 19F9            617        B     SETUP                GO DO INITIAL SET UP
   0F74 C0 87 1C9A            618        B     SELECT               GO SELECT THE DEVICE
   0F78 0C 01 3C2A 3C2D       619        MVC   INVADR(2),INVM1      SET FOR INVALID MOD 1 ADDRESS
   0F7E 38 80 2FFD            620        TBN   RTNFLG,X'80'         TEST FOR MODEL 2
   0F82 F2 90 06              621        JF    R7M1                 JUMP IF NOT
   0F85 0C 01 3C2A 3C2F       622        MVC   INVADR(2),INVM2      SET FOR INVALID MOD 2 ADDRESS
                              623
   0F8B C0 87 1AB4            624 R7M1   B     DOSIO                GO TRY TO SEND INVALID ADDRESS
   0F8F 0007        0F90      625        DC    AL2(RT7PE-RT7P)
   0F91 431F        0F92      626        DC    AL2(XMITE)
   0F93 3C2B        0F94      627        DC    AL2(RT7PE)
                              628
   0F95 4D 01 01 2637         629        CLC   1(2,XR1),EOT         EOT SHOULD HAVE BEEN REC'D
   0F9A F2 01 2B              630        JNE   TOOKBA               JUMP IF NOT
   0F9D C0 87 1C39            631        B     DOPOL                GO POLL TO GET STATUS
   0FA1 38 10 2658            632        TBN   POLFLG,X'10'         TEST FOR STATUS REC'D
   0FA5 C0 90 1D08            633        BF    OHOH                 ERROR IF NOT
   0FA9 0D 01 265B 3C31       634        CLC   POLST(2),OC          TEST STATUS = OC
   0FAF F2 01 08              635        JNE   BADST                JUMP IF NOT
   0FB2 C0 87 1BC6            636        B     GOACK                GO ACKNOWLEDGE
                              637
   0FB6 C0 87 0216            638        B     LINK
                              639
   0FBA 3C 15 262A            640 BADST  MVI   ERR,BDST            SET HALT CODE
   0FBE 0C 01 2FF9 3C31       641        MVC   WORK(2),OC           PUT OP CHECK IN WORK
   0FC4 C0 87 22A7            642        B     ERROR
   0FC8 3C 13 262A            643 TOOKBA MVI   ERR,ACCIN           SET HALT CODE
   0FCC C0 87 22A7            644        B     ERROR
                              645 ********************************************************************
                              646 *      THIS ROUTINE TESTS THAT DATA CHECKS IN THE DEVICE CAN BE DE-   *
                              647 *      TECTED.  THE MICRO CODE IS CHANGED SO THAT BAD PARITY WILL BE  *
                              648 *      SENT TO THE DEVICE.  AFTER THIS IS DONE, A CHECK IS MADE TO    *
                              649 *      DETERMINE THAT THE BAD DATA IS DETECTED.                       *
                              650 ********************************************************************
                              651
   0FD0 08          0FD0      652 RTN08  DC    XL1'08'              START OF ROUTINE 08
   0FD1 00          0FD1      653        DC    XL1'00'
   0FD2 10AF        0FD3      654        DC    AL2(RTN09)
                              655
   0FD4 C0 87 021A            656        B     PRINT                GO PRINT HEADING
   0FD8 01          0FD8      657        DC    XL1'01'
   0FD9 1F          0FD9      658        DC    IL1'31'
   0FDA 27A5        0FDB      659        DC    AL2(HEAD8)
   0FDC C0 87 19F9            660        B     SETUP                GO DO INITIAL SET UP
   0FE0 3C C1 3C62            661        MVI   R8CHR,C'A'           INITIALIZE CHARACTER TO 'A'
   0FE4 0C 05 0FFB 10A2       662        MVC   R8P(6),R8T1          INITIALIZE WRITE PARAMTERS
   0FEA C0 87 1A41            663 R8LOOP B     MODST                GO MODIFY MICRO CODE TO CAUSE
                              664 *                                  TRANSMIT CHECKS
   0FEE C0 87 1C9A            665        B     SELECT               GO SELECT THE DEVICE
                              666
   0FF2 C0 87 1AB4            667        B     DOSIO                GO WRITE ERROR PATTERN
   0FF6 000000000000  0FFB    668 R8P    DC    XL6'0'               WRITE PARAMETERS GET FILLED IN
                              669
   0FFC 4D 01 01 2637         670        CLC   1(2,XR1),EOT         EOT SHOULD HAVE BEEN RETURNED
   1001 F2 01 73              671        JNE   NOTEOT               ERROR IF NOT
   1004 C0 87 2272            672        B     DELAY                WAIT FOR 25 MS
   1008 0019        1009      673        DC    IL2'25'
   100A C0 87 1C39            674        B     DOPOL                GO GET THE STATUS
   100E 38 10 2658            675        TBN   POLFLG,X'10'         CHECK FOR STATUS RETURNED
   1012 F2 90 6A              676        JF    OOPS5                JUMP IF NOT
   1015 0D 01 265B 2649       677        CLC   POLST(2),OCUS        WAS STATUS DATA CHECK, UNIT SPECIFY
   101B F2 81 0E              678        JE    R8FIX                JUMP IF SO
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   101E 0C 01 2FF9 2649       679         MVC   WORK(2),DCUS          PUT EXPECTED STATUS IN WORK
   1024 3C 15 262A            680         MVI   ERR,BDST             SET BAD SATUS INDICATION
   1028 C0 87 22A7            681         B     ERROR
                              682
   102C C0 87 1A52            683 R8FIX   B     FIXST                GO RESTORE MICRO CODE
   1030 C0 87 1C9A            684         B     SELECT               GO SELECT AGAIN
   1034 C0 87 1AB4            685         B     DOSIO                GO WRITE PATTERN OF ALL 'A,B OR C'
   1038 0008            1039  686         DC    AL2(R8P4E-R8P4)
   103A 431F            103B  687         DC    AL2(XMITE)
   103C 3C63            103D  688         DC    AL2(R8P4E)
   103E C0 87 2118            689         B     TRESP1               GO CHECK RESPONSE
   1042 C0 87 1AB4            690         B     DOSIO                GO SEND EOT
   1046 0000            1047  691         DC    XL2'0'
   1048 4201            1049  692         DC    AL2(XMITRC+1)
   104A 2636            104B  693         DC    AL2(EOT-1)
                              694
   104C 3D C1 3C62            695         CLI   R8CHR,C'A'           DID WE JUST WRITE 'A'
   1050 F2 01 0E              696         JNE   TSTB                 IF NOT TEST FOR B
   1053 3C C2 3C62            697         MVI   R8CHR,C'B'           SET FOR B NEXT PASS
   1057 0C 05 0FFB 10A8       698         MVC   R8P(6),R8T2          SET NEW PARAMETERS
   105D C0 87 0FEA            699         B     R8LOOP               GO DO NEXT PATTERN
   1061 3D C2 3C62            700 TSTB    CLI   R8CHR,C'B'           WERE WE DOING 'B'
   1065 C0 01 0216            701         BNE   LINK                 GO TO NEXT ROUTINE IF NOT
   1069 3C C3 3C62            702         MVI   R8CHR,C'C'           SET FOR 'C'
   106D 0C 05 0FFB 10AE       703         MVC   R8P(6),R8T3          SET NEW PARAMTERS
   1073 C0 87 0FEA            704         B     R8LOOP               GO DO NEXT PATTERN
                              705
   1077 3C 14 262A            706 NOTEOT  MVI   ERR,NOEOT            SET ERROR
   107B C0 87 22A7            707         B     ERROR
   107F C0 87 1FD5            708 OOPS5   B     FILLFF               GO FILL EXP. BUFFER WITH FF
   1083 0C 08 2D7B 4208       709         MVC   EXPBUF+8(9),XMITRC+8 MOVE IN POLL MESSAGE
   1089 0C 00 3C69 2605       710         MVC   R8EXP1(1),CURDEV     MOVE IN THE DEVICE
   108F 0C 08 2D84 3C6C       711         MVC   EXPBUF+17(9),R8EXP2  PUT IN EXPECTED RESPONSE
   1095 3C 10 262A            712         MVI   ERR,INCOR            SET ERROR
   1099 C0 87 22A7            713         B     ERROR
                              714
                              714
                              715 *  PARAMETER LIST FOR ROUTINE 8
   109D 0009            109E  716         DC    AL2(R8P1E-R8P1)
   109F 431F            10A0  717         DC    AL2(XMITE)
   10A1 3C44            10A2  718 R8T1    DC    AL2(R8P1E)
   10A3 000B            10A4  719         DC    AL2(R8P2E-R8P2)
   10A5 431F            10A6  720         DC    AL2(XMITE)
   10A7 3C50            10A8  721 R8T2    DC    AL2(R8P2E)
   10A9 0009            10AA  722         DC    AL2(R8P3E-R8P3)
   10AB 431F            10AC  723         DC    AL2(XMITE)
   10AD 3C5A            10AE  724 R8T3    DC    AL2(R8P3E)
                              725 ********************************************************************************
                              726 *      THIS ROUTINE FIRST TESTS THAT BOTH UPPER AND LOWER CASE ALPHA           *
                              727 *      CHARACTERS ARE TRANSMITED AND RECEIVED OKAY.                            *
                              728 *      IT THIS TESTS THE MICRO POLL FEATURE AS FOLLOWS:                        *
                              729 *      FIRST, A MICRO POLL TO THE SELECTED DEVICE IS DONE WITH AN              *
                              730 *      INIFINITE COUNT (FF).  THERE SHOULD BE NO RESPONSE.  A 2SEC.            *
                              731 *      TIMEOUT IS THEN SENT TO CAUSE AN EOT RESPONSE AND INTERRUPT TO          *
                              732 *      THE ORIGINAL MICRO POLL.                                                *
                              733 *      NEXT, THE COUNT IS CHANGED TO 01 AND THE MICRO POLL IS RE-              *
                              734 *      ISSUED.  THIS TIME, TO EOT RESPONSE SHOULD COME IN RIGHT AWAY.          *
                              735 *      NEXT, DEVICE END STATUS IS CAUSED BY RESETTING THE ATTACHMENT           *
                              736 *      AND RE-ENABLING IT.  THE CURRENT DEVICE IS REPEATED 255 TIMES           *
                              737 *      IN THE MICRO POLL LIST.  THE SAR IS SET TO CAUSE A DELIBERATE           *
                              738 *      OVER RUN.  THE MICRO POLL IS THEN ISSUED AND SHOULD GET AN              *
                              739 *      IMMEDIATE DEVICE END STATUS MESSAGE.  MOST OF THE MESSAGE IS            *
                              740 *      LOST BECAUSE OF THE SAR SETTING.                                        *
                              741 *      NOW, NAK IS ISSUED AND THE STATUS MESSAGE WILL BE RETRANSMITTED         *
                              742 *      SO THE ENTIRE MESSAGE IS RECEIVED.                                      *
                              743 ********************************************************************************
                              744
   10AF 09              10AF  745 RTN09   DC    XL1'09'              START OF ROUTINE 09
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EPR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   10B0 00              10B0  746         DC    XL1'00'
   10B1 11F0            10B2  747         DC    AL2(RTN0A)
                              748
   10B3 C0 87 021A            749         B     PRINT                GO PRINT HEADING
   10B7 01              10B7  750         DC    XL1'01'
   10B8 36              10B8  751         DC    IL1'54'
   10B9 27DB            10BA  752         DC    AL2(HEAD9)
   10BB C0 87 19F9            753         B     SETUP                GO DO HOUSEKEEPING
   10BF 3C 03 3EEE            754         MVI   R09PE,3              INSERT ETX AFTER DATA
   10C3 C0 87 1C9A            755         B     SELECT               GO SELECT
   10C7 C0 87 1AB4            756         B     DOSIO                WRITE UPPER/LOWER CASE DATA
   10CB 0052            10CC  757         DC    AL2(R09PE-R09P)
   10CD 431F            10CE  758         DC    AL2(XMITE)
   10CF 3EEE            10D0  759         DC    AL2(R09PE)
   10D1 C0 87 2118            760         B     TRESP1               GO TEST RESPONSE
   10D5 C0 87 1C9A            761         B     SELECT               RESELECT
   10D9 3C FE 3EEE            762         MVI   R09PE,X'FE'          INSERT FE FOR DATA TERMINATOR
   10DD C0 87 1DBB            763         B     READBF               GO READ BUFFER
   10E1 08              10E1  764         DC    XL1'08'              EXPECT UPPER/LOWER CASE PATTERN
   10E2 4040            10E3  765         DC    XL2'4040'            CURSOR AT 0000
                              766
   10E4 3C F0 3FFB            767         MVI   MICPFL,X'F0'         SET MICRO POLL FLG. TO IND NO INT
   10E8 0C 01 4006 2605       768         MVC   MICPD(2),CURDEV      MOVE CURRENT DEVICE TO POLL LIST
   10EE 3C FF 4004            769         MVI   MICPD-2,X'FF'        SET INFINITE COUNT
                              770
   10F2 C0 87 1AB4            771         B     DOSIO                GO DO MICRO POLL, EXP NO REPLAY
   10F6 000B            10F7  772         DC    AL2(MICP1E-MICP1)
   10F8 431F            10F9  773         DC    AL2(XMITE)
   10FA 4007            10FB  774         DC    AL2(MICP1E)
   10FC 3C 00 3FFB            775         MVI   MICPFL,0             RESET THE MICRO POLL FLAG
   1100 C0 87 2272            776         B     DELAY                GO WAIT A SECOND
   1104 03E8            1105  777         DC    IL2'1000'
   1106 3D 00 2610            778         CLI   INTFLG,0             TEST FOR INTERRUPT OCCURRED
   110A F2 01 08              779         JNE   S2SEC                OKAY IF NO INTERRUPT
                              780
   110D 3C 16 262A            781         MVI   ERR,MPINT            SET ERROR CODE
   1111 C0 87 22A7            782         B     ERROR
                              783
   1115 F3 88 06              784 S2SEC   SIO   X'06',CNTRL            ISSUE 2 SEC. T.O. TO END MICRO POLL
   1118 0D FF 4200 4200       785         CLC   XMITRC(256),XMITRC     DELAY TO LET IT HAPPEN
   111E 3D 00 2610            786         CLI   INTFLG,0             TEST FOR INT OCCURRED
   1122 F2 81 10              787         JE    NXTMPT               IF SO CHECK EOT REC'D
                              788
   1125 C0 87 021A            789         B     PRINT                GO PRINT MESSAGE
   1129 82              1129  790         DC    XL1'82'
   112A 33              112A  791         DC    IL1'51'
   112B 2A1B            112C  792         DC    AL2(MPMG2)
   112D 3C 07 262A            793         MVI   ERR,NOINT            SET NO INT ERROR
   1131 C0 87 22A7            794         B     ERROR
                              795
   1135 0D 01 420D 2637       796 NXTMPT  CLC   XMITRC+13(2),EOT      TEST FOR EOT REC'D
   113B F2 81 14              797         JE    TMPCNT               JUMP IF SO
   113E 0C 08 2D7E 4007       798         MVC   EXPBUF+11(12),MICP1E SET UP EXPECTED RESULTS
   1144 0C 01 2D80 2637       799         MVC   EXPBUF+13(2),EOT
   114A 3C 10 262A            800         MVI   ERR,INCOR            SET ERROR CODE
   114E C0 87 22A7            801         B     ERROR
                              802
   1152 3D 0F 3FFB            803 TMPCNT  CLI   MICPFL,X'0F'         TEST FLAG
   1156 F2 81 16              804         JE    TMPDE                GO TO DE TEST IF = 0F
   1159 3C 0F 3FFB            805         MVI   MICPFL,X'0F'         SET FLAG TO INDICATE INT EXP.
   115D 3C 01 4004            806         MVI   MICPD-2,1            SET COUNT TO 1
   1161 C0 87 1AB4            807         B     DOSIO                GO REPEAT & EXPECT INTERRUPT
   1165 000B            1166  808         DC    AL2(MICP1E-MICP1)
   1167 431F            1168  809         DC    AL2(XMITE)
   1169 4007            116A  810         DC    AL2(MICP1E)
   116B C0 87 1135            811         B     NXTMPT               GO CHECK RESULTS
                              812
   116F F3 58 80              813 TMPDE   SIO   X'80',SIOI            DISABLE ATTACHMENT
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8943 DA FUNCTIONAL TESTS

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   1172 F3 58 E0                  814         SIO   X'E0',SIOI            RESTART MICRO CONTROLLER, DEVICE
                                  815 *                                     END SHOULD BE PENDING NOW.
   1175 0C 07 4207 4003           816         MVC   XMITRC+7(8),HICP2     SET UP TRANSMIT/RECEIVE FIELD
   117B 0C 00 4306 2605           817         MVC   XMITRC+262(1),CURDEV  INSERT DEVICE
   1181 0C FD 4305 4306           818         MVC   XMITRC+261(254),XMITRC+262   INSERT DEVICE 255 TIMES
   1187 3C 2D 4307                819         MVI   XMITRC+263,X'2D'      INSERT ENQ AS LAST CHAR
   118B 3C 01 4208                820         MVI   XMITRC+8,X'01'        SET COUNT TO 1
                                  821
   118F F3 88 C0                  822         SIO   ENABLE,CNTRL          RE-ENABLE DA
   1192 3C 0F 3FFB                823         MVI   MICPFL,X'0F'          SET UP FOR MICRO POLL EXPECTS INTR.
   1196 C0 87 1AB4                824         B     DOSIO                 GO DO MICRO POLL, EXPECT DE STATUS
   119A 0107              119B    825         DC    IL2'263'
   119C 4309              119D    826         DC    AL2(XMITRC+265)       STOP SHORT OF FULL MESSAGE
   119E 4307              119F    827         DC    AL2(XMITRC+263)
                                  828
   11A0 0D 01 2620 2624           829         CLC   SCAR(2),SSAR          CAR SHOULD NOW BE EQUAL TO SAR
   11A6 F2 81 08                  830         JE    SNAK                  GO SEND NAK IF SO
   11A9 3C 17 262A                831         MVI   ERR,MPCS              SET ERROR CODE
   11AD C0 87 22A7                832         B     ERROR
                                  833
   11B1 C0 87 1AB4                834 SNAK    B     DOSIO                 GO SEND NAK FOR RETRANSMIT
   11B5 0001              11B6    835         DC    AL2(NAKE-NAK)
   11B7 431F              11B8    836         DC    AL2(XMITE)
   11B9 4009              11BA    837         DC    AL2(NAKE)
   11BB 4D 02 02 264C             838         CLC   2(3,XR1),STATR        BE SURE STATUS WAS RECEIVED
   11C0 F2 81 08                  839         JE    STATRC                JUMP IF SO
   11C3 3C 18 262A                840         MVI   ERR,RNST              SET ERROR CODE
   11C7 C0 87 22A7                941         B     ERROR
                                  842
   11CB 1C 01 265B 07             843 STATRC  MVC   POLST,7(2,XR1)        FETCH THE POLL STATUS
   11D0 0D 01 265B 2643           844         CLC   POLST(2),DE           IT SHOULD BE DE
   11D6 C0 81 0216                845         BE    LINK                  FINISHED IF SO
                                  846
   11DA 0C 01 2FF9 2643           847         MVC   WORK(2),DE            MOVE DE TO EXP. STATUS
   11E0 C0 87 021A                848         B     PRINT                 GO PRINT MESSAGE
   11E4 82                11E4    849         DC    XL1'82'
   11E5 2B                11E5    850         DC    IL1'43'
   11E6 2A46              11E7    851         DC    AL2(MPMG3)
   11E8 3C 15 262A                852         MVI   ERR,BDST              SET ERROR CODE
   11EC C0 87 22A7                853         B     ERROR
                                  854
                                  855 ********************************************************************************
                                  856 *       ROUTINES OA THRU OF ARE USED TO SEND TEST PATTERNS TO THE      *
                                  857 *       DEVICES.  ONE COMMON SUBROUTINE IS USED TO SEND ALL PATTERNS.  *
                                  858 ********************************************************************************
                                  859
   11F0 0A                11F0    860 RTNOA   DC    XL1'0A'               START OF ROUTINE OA
   11F1 80                11F1    861         DC    XL1'80'
   11F2 1239              11F3    862         DC    AL2(RTNOB)
                                  863
   11F4 38 80 020C                864         TBN   SBYTE4,SSW20          IS SSW 20 ON?
   11F8 C0 10 0216                865         BT    LINK                  IF SO, SKIP INSTRUCTIONS
   11FC C0 87 24EA                866         B     CHMODX                GO TEST FOR MODEL 4, SKIP IF SO
   1200 C0 87 021A                867         B     PRINT                 GO PRINT HEADING
   1204 01                1204    868         DC    XL1'01'
   1205 22                1205    869         DC    IL1'34'
   1206 27FD              1207    870         DC    AL2(HEADA)
   1208 C0 87 19F9                871         B     SETUP                 GO DO INITIAL HOUSEKEEPING
   120C 0C 03 3291 31AE           872         MVC   A1A(4),A1             INITIALIZE DEVICE ADDRESS
   1212 38 40 2FFD                873         TBN   RTNFLG,X'40'          TEST FOR DEVICE IS A PRINTER
   1216 F2 10 0A                  874         JT    DEVP                  JUMP IF SO
   1219 0C 05 21CA 1232           875         MVC   TPARM(6),PORD1        MOVE IN TEST PATTERN PARAMETERS
   121F C0 87 21BD                876         B     SENDTP                GO SEND IT
   1223 0C 05 21CA 1238           877 DEVP    MVC   TPARM(6),PORD1A       MOVE IN PRINTER PATTERN PARAMTERS
   1229 C0 87 21BD                878         B     SENDTP                GO SEND PATTERN
                                  879
   122D 00BC              122E    880         DC    AL2(EORD1-ORD1)       PARAMETERS TO SEND TEST PATTERN
   122F 431F              1230    881         DC    AL2(XMITE)
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   1231 3182              1232    882 PORD1   DC    AL2(EORD1)
                                  883
   1233 00E2              1234    884         DC    AL2(EORD1A-ORD1A)
   1235 431F              1236    885         DC    AL2(XMITE)
   1237 3295              1238    886 PORD1A  DC    AL2(EORD1A)
                                  887
                                  887
   1239 0B                1239    888 RTNOB   DC    XL1'0B'               START OF ROUTINE OB
   123A 80                123A    889         DC    XL1'80'
   123B 1283              123C    890         DC    AL2(RTNOC)
                                  891
   123D 38 40 2FFD                892         TBN   RTNFLG,X'40'          IS DEVICE A PRINTER?
   1241 C0 10 0216                893         BT    LINK                  SKIP IF SO
   1245 38 80 020C                894         TBN   SBYTE4,SSW20          IS SSW 20 ON?
   1249 C0 90 24EA                895         BF    CHMODX                GO TEST FOR MODEL 4, SKIP IF SO
   124D 38 80 020C                896         TBN   SBYTE4,SSW20          IS SSW 20 ON?
   1251 39 40 020C                897         TBF   SBYTE4,SSW21          IS SSW 21 OFF?
   1255 C0 10 0216                898         BT    LINK                  SKIP IF SO
   1259 3C C2 2803                899         MVI   HDTP1,C'B'            SET UP HEADING
   125D 3C F1 2814                900         MVI   HEADP,C'1'
   1261 C0 87 021A                901         B     PRINT                 GO PRINT HEADING
   1265 01                1265    902         DC    XL1'01'
   1266 17                1266    903         DC    IL1'23'
   1267 2814              1268    904         DC    AL2(HEADP)
   1269 C0 87 19F9                905         B     SETUP                 GO DO HOUSEKEEPING
   126D 0C 03 3378 31AE           906         MVC   A2(4),A1              SET UP DEVICE ID IN PATTERN
   1273 0C 05 21CA 1282           907         MVC   TPARM(6),PORD2        MOVE IN PARAMTERS
   1279 C0 87 21BD                908         B     SENDTP                GO SEND IT
                                  909
   127D 00E5              127E    910         DC    AL2(EORD2-ORD2)
   127F 431F              1280    911         DC    AL2(XMITE)
   1281 3378              1282    912 PORD2   DC    AL2(EORD2)
                                  913
                                  913
                                  913
   1283 0C                1283    914 RTNOC   DC    XL1'0C'               START OF ROUTINE OC
   1284 80                1284    915         DC    XL1'80'
   1285 1301              1286    916         DC    AL2(RTNOD)
                                  917
   1287 38 40 2FFD                918         TBN   RTNFLG,X'40'          IS DEVICE A PRINTER?
   128B C0 10 0216                919         BT    LINK                  SKIP IF SO
   128F 3C C3 2803                920         MVI   HDTP1,C'C'            SET UP HEADING
   1293 3C F2 2814                921         MVI   HEADP,C'2'
   1297 C0 87 19F9                922         B     SETUP                 GO DO HOUSEKEEPING
   129B 0C 03 341A 31AE           923         MVC   A3(4),A1              SET UP DEVICE ID IN PATTERN
   12A1 0C 03 34F2 31AE           924         MVC   A4(4),A1              SET UP DEVICE ID IN PATTERN
   12A7 38 80 2FFD                925         TBN   RTNFLG,X'80'          TEST FOR DEVICE IS MODEL 2
   12AB F2 10 1D                  926         JT    DM2                   JUMP IF SO
   12AE 38 80 020C                927         TBN   SBYTE4,SSW20          IS SSW 20 ON?
   12B2 C0 90 24EA                928         BF    CHMODX                GO TEST FOR MODEL 4, SKIP IF SO
   12B6 38 80 020C                929         TBN   SBYTE4,SSW20          IS SSW 20 ON?
   12BA 39 20 020C                930         TBF   SBYTE4,SSW22          IS SSW 22 OFF?
   12BE C0 10 0216                931         BT    LINK                  IF SO, SKIP THIS PATTERN
   12C2 0C 05 21CA 12FA           932         MVC   TPARM(6),PORD3        MOVE IN MODEL 1 PARAMTERS
   12C8 F2 87 1E                  933         J     PHD                   GO PRINT HEADING
   12CB 0C 05 21CA 1300           934 DM2     MVC   TPARM(6),PORD4        MOVE IN MODEL 2 PARAMTERS
   12D1 3C F3 2814                935         MVI   HEADP,C'3'            SET FOR TEST PATTERN 3
   12D5 38 80 020C                936         TBN   SBYTE4,SSW20          TEST SSW 20 ON
   12D9 C0 90 24EA                937         BF    CHMODX                GO TEST FOR MODEL 4, SKIP IF SO
   12DD 38 80 020C                938         TBN   SBYTE4,SSW20          IS SSW 20 ON?
   12E1 39 10 020C                939         TBF   SBYTE4,SSW23          TEST SSW 23 OFF
   12E5 C0 10 0216                940         BT    LINK
   12E9 C0 87 021A                941 PHD     B     PRINT                 GO PRINT HEADING
   12ED 01                12ED    942         DC    XL1'01'
   12EE 17                12EE    943         DC    IL1'23'
   12EF 2814              12F0    944         DC    AL2(HEADP)
   12F1 C0 87 21BD                945         B     SENDTP                GO SEND PATTERN
                                  946
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   12F5 00A1             12F6  947         DC    AL2(EORD3-ORD3)
   12F7 431F             12F8  948         DC    AL2(XMITE)
   12F9 341D             12FA  949 PORD3   DC    AL2(EORD3)
   12FB 00D7             12FC  950         DC    AL2(EORD4-ORD4)
   12FD 431F             12FE  951         DC    AL2(XMITE)
   12FF 34F5             1300  952 PORD4   DC    AL2(EORD4)
                               953
                               953
                               953
   1301 0D               1301  954 RTNOD   DC    XL1'0D'          START OF ROUTINE OD
   1302 80               1302  955         DC    XL1'80'
   1303 134B             1304  956         DC    AL2(RTNOE)
                               957
   1305 38 40 2FFD             958         TBN   RTNFLG,X'40'     IS DEVICE A PRINTER?
   1309 C0 90 0216             959         BF    LINK             SKIP IF NOT
   130D 38 80 020C             960         TBN   SBYTE4,SSW20     IS SSW 20 ON?
   1311 C0 90 24EA             961         BF    CHMODX           GO TEST FOR MODEL 4, SKIP IF SO
   1315 38 80 020C             962         TBN   SBYTE4,SSW20     IS SSW 20 ON?
   1319 39 08 020C             963         TBF   SBYTE4,SSW24     IS SSW 24 OFF?
   131D C0 10 0216             964         BT    LINK             IF SO, SKIP THIS PATTERN
   1321 3C C4 2803             965         MVI   HDTP1,C'D'       SET UP HEADING
   1325 3C F4 2814             966         MVI   HEADP,C'4'
   1329 C0 87 021A             967         B     PRINT            GO PRINT HEADING
   132D 01               132D  968         DC    XL1'01'
   132E 17               132E  969         DC    IL1'23'
   132F 2814             1330  970         DC    AL2(HEADP)
   1331 C0 87 19F9             971         B     SETUP            GO DO INITIAL HOUSEKEEPING
   1335 0C 03 35AF 31AE        972         MVC   A5(4),A1         SET UP ADDRESS IN PATTERN
   133B 0C 05 21CA 134A        973         MVC   TPARM(6),PORD5   MOVE IN PARAMETERS
   1341 C0 87 21BD             974         B     SENDTP           GO SEND PATTERN
                               975
   1345 00BC             1346  976         DC    AL2(EORD5-ORD5)
   1347 431F             1348  977         DC    AL2(XMITE)
   1349 35B2             134A  978 PORD5   DC    AL2(EORD5)
                               979
                               979
                               979
   134B 0E               134B  980 RTNOE   DC    XL1'0E'          START OF ROUTINE 0E
   134C 80               134C  981         DC    XL1'80'
   134D 139D             134E  982         DC    AL2(RTNOF)
                               983
   134F 38 80 020C             984         TBN   SBYTE4,SSW20     IS SSW 20 ON?
   1353 C0 90 24EA             985         BF    CHMODX           GO TEST FOR MODEL 4, SKIP IF SO
   1357 38 80 020C             986         TBN   SBYTE4,SSW20     IS SSW 20 ON?
   1358 39 04 020C             987         TBF   SBYTE4,SSW25     IS SSW 25 OFF?
   135F C0 10 0216             988         BT    LINK             IF SO, SKIP THIS PATTERN
   1363 3C C5 2803             989         MVI   HDTP1,C'E'       SET UP HEADING
   1367 3C F5 2814             990         MVI   HEADP,C'5'
   136B C0 87 021A             991         B     PRINT            GO PRINT HEADING
   136F 01               136F  992         DC    XL1'01'
   1370 17               1370  993         DC    IL1'23'
   1371 2814             1372  994         DC    AL2(HEADP)
   1373 C0 87 19F9             995         B     SETUP            GO DO INITIAL HOUSEKEEPING
   1377 C0 87 1C9A             996         B     SELECT           GO SELECT DEVICE
   137B 0C 03 36C7 31AE        997         MVC   A6(4),A1         SET ADDRESS IN PATTERN
   1381 0C 05 21CA 139C        998         MVC   TPARM(6),PORD6   MOVE IN PARAMETERS
   1387 0C 71 4271 3624        999         MVC   XMITRC+L16-1(L16),MIDOR6-1   SET UP XMIT/REC. FIELD THE
   138D 0C A9 431B 36CE       1000         MVC   XMITRC+ETEXT6-1(L26),EORD6    LENGTH IS OVER 256
   1393 C0 87 21C1            1001         B     SENTPB           GO SEND PATTERN
                              1002
   1397 011B             1398 1003         DC    AL2(EORD6-ORD6)
   1399 431F             139A 1004         DC    AL2(XMITE)
   139B 36CE             139C 1005 PORD6   DC    AL2(EORD6)
                              1006
                              1006
                              1006
   139D 0F               139D 1007 RTNOF   DC    XL1'0F'          START OF ROUTINE 0F
   139E 80               139E 1008         DC    XL1'80'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   139F 13E7             13A0 1009         DC    AL2(RTN10)
                              1010
   13A1 38 40 2FFD             1011         TBN   RTNFLG,X'40'     IS DEVICE A PRINTER?
   13A5 C0 90 0216             1012         BF    LINK             SKIP IF NOT
   13A9 38 80 020C             1013         TBN   SBYTE4,SSW20     IS SSW 20 ON?
   13AD C0 90 24EA             1014         BF    CHMODX           GO TEST FOR MODEL 4, SKIP IF SO
   13B1 38 80 020C             1015         TBN   SBYTE4,SSW20     IS SSW 20 ON?
   13B5 39 02 020C             1016         TBF   SBYTE4,SSW26     IS SSW 26 OFF?
   13B9 C0 10 0216             1017         BT    LINK             IF SO, SKIP THIS PATTERN
   13BD 3C C6 2803             1018         MVI   HDTP1,C'F'       SET UP HEADING
   13C1 3C F6 2814             1019         MVI   HEADP,C'6'
   13C5 C0 87 021A             1020         B     PRINT            GO PRINT HEADING
   13C9 01               13C9  1021         DC    XL1'01'
   13CA 17               13CA  1022         DC    IL1'23'
   13CB 2814             13CC  1023         DC    AL2(HEADP)
   13CD C0 87 19F9             1024         B     SETUP            GO DO INITIAL HOUSEKEEPING
   13D1 0C 03 37BC 31AE        1025         MVC   A7(4),A1         SET ADDRESS IN PATTERN
   13D7 0C 05 21CA 13E6        1026         MVC   TPARM(6),PORD7   MOVE IN PARAMETERS
   13DD C0 87 21BD             1027         B     SENDTP           GO SEN THE PATTERN
                               1028
   13E1 00F9             13E2  1029         DC    AL2(EORD7-ORD7)
   13E3 431F             13E4  1030         DC    AL2(XMITE)
   13E5 37BF             13E6  1031 PORD7   DC    AL2(EORD7)
                               1032
                               1032
                               1032
                               1033 ********************************************************************
                               1034 *      THIS ROUTINE IS USED TO TEST ALL OF THE MANUAL ENTRY        *
                               1035 *      FUNCTIONS OF THE KEYBOARD.                                  *
                               1036 ********************************************************************
                               1037
   13E7 10               13E7  1038 RTN10   DC    XL1'10'          START OF ROUTINE 10
   13E8 80               13E8  1039         DC    XL1'80'
   13E9 1629             13EA  1040         DC    AL2(RTN11)
                               1041
   13EB 38 40 2FFD             1042         TBN   RTNFLG,X'40'     TEST FOR PRINTER
   13EF C0 10 0216             1043         BT    LINK             SKIP THIS ROUTINE IF SO
   13F3 38 08 020A             1044         TBN   SBYTE2,SSW14     TEST FOR NO KEYBOARD
   13F7 C0 10 0216             1045         BT    LINK             SKIP IF SO
   13FB C0 87 24EA             1046         B     CHMODX           GO TEST FOR MODEL 4, SKIP IF SO
   13FF C0 87 19F9             1047         B     SETUP            GO DO INITIAL HOUSEKEEPING
   1403 C0 87 021A             1048         B     PRINT            GO PRINT RTN HEADING
   1407 01               1407  1049         DC    XL1'01'
   1408 1F               1408  1050         DC    IL1'31'
   1409 2833             140A  1051         DC    AL2(HEAD10)
   140B 38 10 020A             1052         TBN   SBYTE2,SSW13     TEST FOR SEL PEN BUT NO KEYBOARD
   140F F2 90 17               1053         JF    R10ST            JUMP IF KEYBOARD INSTALLED
   1412 C2 02 3AAC             1054         LA    SKTOSP,XR2       POINT TO SEL PEN ROUTINE
   1416 34 02 3904             1055         ST    CURAID,XR2
   141A 0C 00 3ADE 2605        1056         MVC   AIDEX1-1(1),CURDEV   SET EXPECTED FIELD
   1420 2C 00 3ADF 00          1057         MVC   AIDEX1,0(1,XR2)
   1425 C0 87 15F9             1058         B     SELPEN           GO DO SEL PEN ROUTINE ONLY
   1429 C0 87 1C9A             1059 R10ST   B     SELECT           GO SELECT THE DEVICE
   142D C0 87 1AB4             1060         B     DOSIO            GO WRITE INITIAL PATTERN
   1431 00BB             1432  1061         DC    AL2(AIDT1E-AIDT1)
   1433 431F             1434  1062         DC    AL2(XMITE)
   1435 3902             1436  1063         DC    AL2(AIDT1E)
                               1064
   1437 C0 87 2118             1065         B     TRESP1           TEST FOR ACK1 RETURNED
   143B C2 02 39E6             1066         LA    AIDTAB,XR2       FETCH ADDRESS OF AID TABLE
   143F 34 02 3904             1067         ST    CURAID,XR2       STORE IT
   1443 C0 87 1FD5             1068         B     FILLFF           GO FILL EXP RESULTS BUFFER WITH FF
   1447 0C 00 3ADE 2605        1069         MVC   AIDEX1-1(1),CURDEV   SET UP DEVICE IN EXP RESULTS
   144D 2C 00 3ADF 00          1070         MVC   AIDEX1,0(1,XR2)    SET UP AID IN EXP RESULTS
   1452 0C 11 2D8D 3AED        1071         MVC   EXPBUF+26(18),AIDEX2   SET UP EXP BUFFER FOR 1ST TEST
   1458 3C 00 2FF8             1072         MVI   WORK-1,0         CLEAR CANCEL FLAG
                               1073
   145C C0 87 1C39             1074 AIDPOL B     DOPOL            GO POLL THE DEVICE
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    1460 0C 08 2D7B 25FB      1075         MVC   EXPBUF+8(9),ENQ       PUT POLL IN EXPECTED RESULTS
    1466 35 02 3904           1076         L     CURAID,XR2            POINT XR2 TO CURRENT AID TABLE
    146A 38 10 2658           1077         TBN   POLFLG,X'10'           TEST FOR STATUS RECEIVED
    146E C0 10 1502           1078         BT    OOPS2                 ERROR IF SO
    1472 38 20 2658           1079         TBN   POLFLG,X'20'           TEST FOR TEST REQ. REC'D
    1476 C0 10 15EA           1080         BT    TRR                   BRANCH IF SO
    147A 38 40 2658           1081         TBN   POLFLG,X'40'           TEST FOR AID REC'D
    147E C0 90 145C           1082         BF    AIDPOL                MUST BE EOT, GO POLL AGAIN
                              1083
    1482 6D 00 03 00          1084         CLC   3(1-XR1),0(,XR2)      TEST FOR CORRECT AID REC'D
    1486 C0 81 1520           1085         BE    AIDOK                 BRANCH IF SO
                              1086
    148A 1C 00 2FF9 03        1087         MVC   WORK,3(1,XR1)         FETCH THE REC'D AID
    148F C2 01 39E6           1086 CHAID   LA    AIDTAB,XR1            POINT XR1 TO TABLE
    1493 1D 00 2FF9 00        1089 TSTAID  CLC   WORK,0(1,XR1)         TEST THE REC'D AID AGAINST TABLE
    1498 F2 81 0A             1090         JE    AIDFND                JUMP WHEN FOUND
    149B D2 01 0B             1091         LA    11(,XR1),XR1          INCREMENT TO NEXT ENTRY
    149E 7D 40 00             1092         CLI   0(,XR1),C' '          TEST FOR LAST ENTRY
    14A1 C0 01 1493           1093         BNE   TSTAID                BRANCH IF NOT
    14A5 1C 09 3944 0A        1094 AIDFND  MVC   AIDRC,10(10,XR1)      MOVE THE AID TO THE MESSAGE
    14AA C0 87 021E           1095         B     UNPACK                UNPACK THE HEX VALUE
    14AE 01             14AE  1096         DC    XL1'1'
    14AF 2FF9           14B0  1097         DC    AL2(WORK)
    14B1 394C           14B2  1098         DC    AL2(HEXAID-3)
                              1099
    14B3 C0 87 1C9A           1100         B     SELECT                RESELECT THE DEVICE
    14B7 3D 6E 2FF9           1101         CLI   WORK,X'6E'            WAS AID REC'D = PA-2(CNCL)
    14BB F2 01 24             1102         JNE   NOPA2                 JUMP IF NOT
    14BE 3D 7E 3ADF           1103         CLI   AIDEX1,X'7E'          DOING SEL PEN TEST?
    14C2 C0 81 1575           1104         BE    EOTOUT                EXIT IF SO
    14C6 38 FF 2FF8           1105         TBN   WORK-1,X'FF'          WAS THIS SECOND PASS
    14CA F2 90 15             1106         JF    NOPA2                 JUMP IF NOT
    14CD 3D F1 3ADF           1107         CLI   AIDEX1,X'F1'          WAS EXPECTED AID PF-1?
    14D1 F2 81 07             1108         JE    SKIPTR                IF SO SKIP REST OF PF'S
    14D4 3D F6 3ADF           1109         CLI   AIDEX1,X'F6'          WAS EXPECTED AID PF-6?
    14D8 F2 01 7F             1110         JNE   NXTKEY                GO ON IF NOT
    14DB C2 02 3A6A           1111 SKIPTR  LA    TRSKIP,XR2            SET XR2 TO SKIP REST OF PF'S
    14DF F2 87 78             1112         J     NXTKEY                GO ON RESUME WITH TEST REQ
    14E2 3A FF 2FF8           1113 NOPA2   SBN   WORK-1,X'FF'           INDICATE 1ST PASS DONE
    14E6 C0 87 1AB4           1114         B     DOSIO                 GO WRITE ERROR MESSAGE
    14EA 0057           14EB  1115         DC    AL2(AIDT3E-AIDT3)
    14EC 431F           14ED  1116         DC    AL2(XMITE)
    14EE 3978           14EF  1117         DC    AL2(AIDT3E)
    14F0 C0 87 2118           1118         B     TRESP1                GO TEST CORRECT RESPONSE
                              1119
    14F4 C0 87 1AB4           1120 AIDLP   B     DOSIO                 GO SEND EOT TO DEVICE
    14F8 0000           14F9  1121         DC    XL2'0'
    14FA 4201           14FB  1122         DC    AL2(XMITRC+1)
    14FC 2636           14FD  1123         DC    AL2(EOT-1)
    14FE C0 87 145C           1124         B     AIDPOL                GO START POLLING AGAIN
                              1125
    1502 BD 6D 00             1126 OOPS2   CLI   0(,XR2),X'6D'          WAS AID BEING DONE = CLEAR
    1505 F2 01 10             1127         JNE   OOPS1                 ERROR IF NOT
    1508 38 08 265A           1128         TBN   POLST-1,X'08'         TEST FOR BUSY
    150C C0 10 145C           1129         BT    AIDPOL                POLL AGAIN IF SO
    1510 38 02 265A           1130         TBN   POLST-1,X'02'         TEST FOR DEVICE END
    1514 C0 10 145C           1131         BT    AIDPOL                POLL AGAIN IF SO
    1518 3C 04 262A           1132 OOPS1   MVI   ERR,UNX                SET UNEXPECTED RESPONSE
    151C C0 87 22A7           1133         B     ERROR                 GO TO ERROR ROUTINE
                              1134
    1520 0D FF 2E72 42FF      1135 AIDOK   CLC   EXPBUF+255(256),XMITRC+255  TEST EXP AND ACTUAL RESULTS
    1526 F2 81 31             1136         JE    NXTKEY
    1529 2C 09 3B0E 0A        1137         MVC   INCORP(10),10(,XR2)   FIX UP MESSAGE
    152E C0 87 021A           1138         B     PRINT                 GO PRINT FAILING AID KEY
    1532 82             1532  1139         DC    XL1'82'
    1533 21             1533  1140         DC    IL1'33'
    1534 3B0E           1535  1141         DC    AL2(INCORP)
    1536 C0 87 1FE9           1142         B     PXREXA                GO PRINT EXP. & ACTUAL RESULTS
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    153A C0 87 1C9A           1143 WRTERM  B     SELECT                GO RESELECT DEVICE
    153E C0 87 1AB4           1144         B     DOSIO                 GO WRITE ERROR MESSAGE ON TUBE
    1542 0051           1543  1145         DC    AL2(AIDT5E-AIDT5)
    1544 431F           1545  1146         DC    AL2(XMITE)
    1546 39D6           1547  1147         DC    AL2(AIDT5E)
    1548 C0 87 2118           1148         B     TRESP1                GO TEST CORRECT RESPONSE
    154C 35 02 3904           1149         L     CURAID,XR2            RELOAD XR2
    1550 3D 7E 3ADF           1150         CLI   AIDEX1,X'7E'          DOING SEL PEN TEST?
    1554 F2 81 C4             1151         JE    SPRTY                 JUMP IF SO
    1557 F2 87 12             1152         J     NXTAID                GO TO NEXT AID TEST
                              1153
    155A C0 87 1C9A           1154 NXTKEY  B     SELECT                GO RESELECT DEVICE
    155E C0 87 1AB4           1155         B     DOSIO                 ERASE PREVIOS MESSAGES
    1562 000B           1563  1156         DC    AL2(AIDT4E-AIDT4)
    1564 431F           1565  1157         DC    AL2(XMITE)
    1566 3984           1567  1158         DC    AL2(AIDT4E)
    1568 C0 87 2118           1159         B     TRESP1                GO TEST CORRECT RESPONSE
                              1160
    156C E2 02 0B             1161 NXTAID  LA    11(,XR2),XR2          INCREMENT XR2 TO NEXT TABLE ENTRY
    156F BD E6 00             1162         CLI   0(,XR2),X'E6'         TEST FOR READER TEST (END)
    1572 F2 01 0E             1163         JNE   NEWAID                JUMP IF NOT
    1575 C0 87 1AB4           1164 EOTOUT  B     DOSIO                 GO SEND EOT TO DEVICE
    1579 0000           157A  1165         DC    XL2'0'
    157B 4201           157C  1166         DC    AL2(XMITRC+1)
    157D 2636           157E  1167         DC    AL2(EOT-1)
    157F C0 87 0216           1168         B     LINK                  GO TO NEXT ROUTINE
                              1169
    1583 2C 09 391F 0A        1170 NEWAID  MVC   AIDM,10(10,XR2)        MOVE NEW AID TO MESSAGE
    1588 3C 00 2FF8           1171         MVI   WORK-1,0              RESET PASS FLAG
    158C 34 02 3904           1172         ST    CURAID,XR2            STORE NEW TABLE ENTRY
                              1173
    1590 CC 87 1FD5           1174         B     FILLFF                FILL EXP RESULTS BUFFER WITH FF
    1594 2C 00 3ADF 00        1175         MVC   AIDEX1,0(1,XR2)       SET UP NEW AID FOR EXP RESULTS
    1599 BD 7E 00             1176         CLI   0(,XR2),X'7E'         DOING SEL PEN TEST?
    159C F2 81 5A             1177         JE    SELPEN                JUMP IF SO
    159F BD F0 00             1178         CLI   0(,XR2),X'F0'         IS NEXT AID TEST REQ?
    15A2 F2 81 16             1179         JE    SUTR                  JUMP IF SO
    15A5 B8 60 00             1180         TBN   0(,XR2),X'60'         TEST FOR SHORT READ
    15A8 B9 90 00             1181         TBF   0(,XR2),X'90'           PA KEYS OR CLEAR
    15AB F2 90 20             1182         JF    NORAID                NORMAL AID IF NOT
    15AE 0C 03 2D7F 3ADF      1183         MVC   EXPBUF+12(4),AIDEX1   SET UP EXP RESULTS FOR SHORT READ
    15B4 3C 03 2D80           1184         MVI   EXPBUF+13,X'03'
    15B8 F2 87 19             1185         J     WRTAID                GO WRITE PATTERN
    15BB 0C 02 2D7E 264F      1186 SUTR    MVC   EXPBUF+11(3),TSTREQ   MOVE IN TST REQ HEADING
    15C1 3C 02 2D7F           1187         MVI   EXPBUF+12,2           INSERT STX
    15C5 0C 08 2D8B 3AED      1188         MVC   EXPBUF+24(12),AIDEX2
    15CB F2 87 06             1189         J     WRTAID                GO WRITE PATTERN
    15CE 0C 11 2D8D 3AED      1190 NORAID  MVC   EXPBUF+26(18),AIDEX2   MOVE IN NORMAL EXP. RESULTS
                              1191
    15D4 C0 87 1C9A           1192 WRTAID  B     SELECT                GO RESELECT DEVICE
    15D8 C0 87 1AB4           1193         B     DOSIO                 GO WIRTE NEW AID TO TRY
    15DC 001B           15DD  1194         DC    AL2(AIDT2E-AIDT2)
    15DE 431F           15DF  1195         DC    AL2(XMITE)
    15E0 3920           15E1  1196         DC    AL2(AIDT2E)
    15E2 C0 87 2118           1197         B     TRESP1                GO TEST FOR CORRECT RESPONSE
    15E6 C0 87 14F4           1198         B     AIDLP                 GO LOOP
                              1199
    15EA BD F0 00             1200 TRR     CLI   0(,XR2),X'F0'         WAS TEST REQ. EXPECTED
    15ED C0 81 1520           1201         BE    AIDOK                 OK IF SO
    15F1 3C F0 2FF9           1202         MVI   WORK,X'F0'            SET UP FOR TEST REQ.
    15F5 C0 87 148F           1203         B     CHAID                 GO HANDLE ERROR IF NOT
                              1204
    15F9 0C 08 2D84 3AE4      1205 SELPEN  MVC   EXPBUF+17(9),AIDEX2-9   SET UP EXPECTED RESULTS
    15FF 0C 09 2D8B 3FFA      1206         MVC   EXPBUF+24(10),SELPEX
                              1207
    1605 C0 87 1C9A           1208         B     SELECT                GO SELECT DEVICE AGAIN
    1609 C0 87 1AB4           1209         B     DOSIO                 PUT SEL PEN PATTERN ON
    160D 00D1           160E  1210         DC    AL2(AIDT6E-AIDT6)
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   160F 431F             1610 1211         DC    AL2(XMITE)
   1611 3FC0             1612 1212         DC    AL2(AIDT6E)
   1613 C0 87 2118            1213         B     TRESP1              GO CHECK RESPONSE
   1617 C0 87 14F4            1214         B     AIDLP               GO WAIT FOR RESPONSE
                              1215
   161B C0 87 1AB4            1216 SPRTY   B     DOSIO               WRITE RETRY ON TUBE
   161F 002F             1620 1217         DC    AL2(AIDT7E-AIDT7)
   1621 431F             1622 1218         DC    AL2(XMITE)
   1623 3FF0             1624 1219         DC    AL2(AIDT7E)
   1625 C0 87 14F4            1220         B     AIDLP               RETURN TO LOOP
                              1221 ********************************************************************
                              1222 *      THIS ROUTINE CHECKS THAT THE KEYBOARD CAN CORRECTLY ENTER    *
                              1223 *      BOTH UPPER AND LOWER CASE ALPHABET CHARACTERS.               *
                              1224 ********************************************************************
                              1225
   1629 11               1629 1226 RTN11   DC    XL1'11'             START OF ROUTINE 11
   162A 80               162A 1227         DC    XL1'80'
   162B 17C4             162C 1228         DC    AL2(RTN12)
                              1229
   162D 38 40 2FFD            1230         TBN   RTNFLG,X'40'        IS THE DEVICE A PRINTER
   1631 C0 10 0216            1231         BT    LINK                SKIP THIS ROUTINE IF SO
   1635 39 18 020A            1232         TBF   SBYTE2,SSW14+SSW13  TEST FOR NO KEYBOARD
   1639 C0 90 0216            1233         BF    LINK                SKIP IF SO
   163D C0 87 24EA            1234         B     CHMODX              GO TEST FOR MODEL 4, SKIP IF SO
   1641 38 01 0A0C            1235         TBN   LINES,X'01'         TEST FOR KATAKANA INSTALLED
   1645 C0 10 0216            1236         BT    LINK                SKIP THIS ROUTINE IF SO
   1649 C0 87 19F9            1237         B     SETUP               GO DO HOUSEKEEPING
   164D C0 87 021A            1238         B     PRINT               GO PRINT RTN HEADING
   1651 01               1651 1239         DC    XL1'01'
   1652 2D               1652 1240         DC    IL1'45'
   1653 2860             1654 1241         DC    AL2(HEAD11)
   1655 C0 87 1C9A            1242 R11RT1  B     SELECT              GO SELECT THE DEVICE
   1659 C0 87 1AB4            1243         B     DOSIO               GO WRITE PATTERN FOR KEYBOARD TST
   165D 00D6             165E 1244         DC    AL2(R11P1E-R11P1)
   165F 431F             1660 1245         DC    AL2(XMITE)
   1661 3D47             1662 1246         DC    AL2(R11P1E)
   1663 C0 87 2118            1247         B     TRESP1              GO TEST CORRECT RESPONSE
   1667 0C 00 3E95 2605       1248         MVC   R11EX1-1(1),CURDEV  PUT DEVICE IN EXP. RESULTS
   166D C0 87 1735            1249 R11PL   B     R11POL              GO POLL DEVICE & WAIT
   1671 3D 6E 2659            1250         CLI   AID,X'6E'           WAS THE RESPONSE CNCL?
   1675 C0 81 1756            1251         BE    R11UNL              IF SO, GO UNLOCK & POLL MORE
   1679 C0 87 1FD5            1252         B     FILLFF              FILL EXP. BUFFER WITH FF
   167D 0C 00 3E96 2659       1253         MVC   R11EX1(1),AID       FILL IN EXPECTED AID
   1683 0C 08 2D7B 25FB       1254         MVC   EXPBUF+8(9),ENQ     FILL IN POLL PORTION OF BUFFER
   1689 0C 08 2D84 3E9B       1255         MVC   EXPBUF+17(9),R11EX2 FILL IN 1ST PART OF RESPONSE
   168F 38 20 265A            1256         TBN   POLFLG,X'20'        WAS TST REQ. REC'D
   1693 F2 90 1D              1257         JF    R11TE               JUMP IF NOT
   1696 0C 02 2D7E 264F       1258         MVC   EXPBUF+11(3),TSTREQ MOVE IN TST REQ. HEADING
   169C 3C 02 2D7F            1259         MVI   EXPBUF+12,2         MOVE IN STX
   16A0 0C 02 2D82 3E9B       1260         MVC   EXPBUF+15(3),R11EX2
   16A6 0C 19 2D9C 3D8D       1261         MVC   EXPBUF+41(26),UCP   UPPER CASE EXPECTED
   16AC 3C 03 2D9D            1262         MVI   EXPBUF+42,3         INSERT ETX
   16B0 F2 87 0A              1263         J     CONDF
   16B3 0C 19 2D9E 3CCF       1264 R11TE   MVC   EXPBUF+43(26),LCP   LOWER CASE WAS EXPECTED
   16B9 3C 03 2D9F            1265         MVI   EXPBUF+44,3         INSERT ETX IN EXP. RESULTS
   16BD 0C 00 2661 2659       1266 CONDE   MVC   SAVAID(1),AID       SAVE THE AID CHAR.
   16C3 0D FF 42FF 2E72       1267         CLC   XMITRC+255(256),EXPBUF+255  CHECK RESULTS CORRECT
   16C9 F2 81 1B              1268         JE    R11GO1              JUMP IF SO
   16CC C0 87 1783            1269         B     R11ER               OOPS, ERROR GO HANDLE
   16D0 3D 6E 2659            1270         CLI   AID,X'6E'           WAS THE AID - CANCEL?
   16D4 F2 81 10              1271         JE    R11GO1              IF SO GO TO NEXT PART
   16D7 38 20 2658            1272         TBN   POLFLG,X'20'        WAS TST REQ. REC'D
   16DB C0 10 17A5            1273         BT    R11PA               RETURN TO POLL IF SO
   16DF 3D 7D 2659            1274         CLI   AID,X'7D'           WAS AID CHAR ENTER
   16E3 C0 87 1655            1275         B     R11RT1              GO RETRY IF SO
   16E7 38 20 2658            1276 R11GO1  TBN   POLFLG,X'20'        WAS TST REQ. REC'D
   16EB C0 10 0216            1277         BT    LINK                DONE IF SO
   16EF C0 87 1C9A            1278 R11RT2  B     SELECT              GO SELECT AGAIN
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   16F3 C0 87 1AB4            1279         B     DOSIO               WRITE NEW PATTERN
   16F7 0067             16F8 1280         DC    AL2(R11P2E-R11P2)
   16F9 431F             16FA 1281         DC    AL2(XMITE)
   16FB 3DAF             16FC 1282         DC    AL2(R11P2E)
   16FD C0 87 2118            1283         B     TRESP1              GO CHECK RESPONSE
   1701 C0 87 1735            1284 R11PB   B     R11POL              GO POLL & WAIT FOR RESPONSE
   1705 3D 7D 2659            1285 R11B    CLI   AID,X'7D'           WAS ENTER REC'D
   1709 C0 01 1756            1286         BNE   R11UNL              IGNORE IF NOT
   170D 0C 19 2D9E 3D8D       1287         MVC   EXPBUF+43(26),UCP   MOVE UPPER CASE TO EXP BUFFER
   1713 0D FF 42FF 2E72       1288         CLC   XMITRC+255(256),EXPBUF+255  CHECK FOR CORRECT RESULT
   1719 C0 81 0216            1289         BE    LINK                DONE IF SO
                              1290
   171D C0 87 1783            1291         B     R11ER               GO TO ERROR ROUTINE
   1721 3D 7D 2659            1292         CLI   AID,X'7D'           WAS ENTER REC'D
   1725 C0 81 16EF            1293         BE    R11RT2              IF SO GO RETRY
   1729 3D 6E 2659            1294         CLI   AID,X'6E'           WAS AID = CNCL
   172D C0 01 17A5            1295         BNE   R11PA               RETURN TO POLLING IF NOT
   1731 C0 87 0216            1296         B     LINK                DONE IF CNCL REC'D
                              1297
                              1297
                              1297
                              1298 *  SUBROUTINE TO POLL FOR ROUTINE 11. - RETURNS WHEN TST REQ., CNCL OR
                              1299 *  ENTER ARE DETECTED.  ANY STATUS CAUSES ERROR
                              1300
   1735 34 08 1776            1301 R11POL  ST    R11POR+3,ARR        STORE RETURN ADDRESS
   1739 C0 87 1C39            1302 R11P    B     DOPOL               GO POLL THE DEVICE
   173D 38 10 2658            1303         TBN   POLFLG,X'10'        WAS STATUS REC'D
   1741 F2 10 33              1304         JT    R11CB               GO CHECK FOR BUSY, ERROR IF NOT
   1744 38 20 2658            1305         TBN   POLFLG,X'20'        WAS TEST REQ. REC'D
   1748 F2 10 28              1306         JT    R11POR              IF SO, RETURN
   174B 38 40 2658            1307         TBN   POLFLG,X'40'        WAS AID REC'D
   174F F2 10 12              1308         JT    R11AT
   1752 C0 87 1739            1309         B     R11P                GO POLL AGAIN
   1756 C0 87 1AB4            1310 R11UNL  B     DOSIO               GO UNLOCK KEYBOARD
   175A 0004             175B 1311         DC    AL2(UNLOCE-UNLOCK)
   175C 431F             175D 1312         DC    AL2(XMITE)
   175E 30F5             175F 1313         DC    AL2(UNLOCE)
   1760 C0 87 1739            1314         B     R11P                RETURN TO POLLING
   1764 3D 7D 2659            1315 R11AT   CLI   AID,X'7D'           WAS ENTER REC'D
   1768 F2 81 08              1316         JE    R11POR              EXIT IF SO
   176B 3D 6E 2659            1317         CLI   AID,X'6E'           WAS CNCL REC'D
   176F C0 90 1756            1318         BF    R11UNL              UNLOCK & RETURN TO POLL IF NOT
   1773 C0 87 0000            1319 R11POR  B     *-*                 RTN TO USER  IF TST REQ,ENTER, CNCL
                              1320
   1777 39 0A 265A            1321 R11CB   TBF   POLST-1,X'0A'       TEST IF BOTH DB AND DE ARE OFF
   177B C0 90 1739            1322         BF    R11P                POLL AGAIN IF NOT
   177F C0 87 1518            1323         B     OOPS1               ERROR IF BOTH DB AND DE ARE OFF
                              1324
                              1324
                              1324
                              1325 *  SUBROUTINE TO HANDLE ERROR FOR ROUTINE 11.  CAUSES TRANSMIT/REC
                              1326 *  & EXPECTED RESULTS TO BE DUMPED ON PRINTER AND ALLOWS CE OPTION
                              1327 *  CANCEL OR RETRY.
                              1328
   1783 34 08 17C3            1329 R11ER   ST    R11ERR+3,ARR        STORE RETURN ADDRESS
   1787 C0 87 021A            1330         B     PRINT               GO PRINT MESSAGE
   178B 81               178B 1331         DC    XL1'81'
   178C 21               178C 1332         DC    IL1'33'
   178D 3E92             178E 1333         DC    AL2(R11MG)
                              1334
   178F C0 87 1FE9            1335         B     PXREXA              GO PRINT ACT & EXP RESULTS
   1793 C0 87 1C9A            1336 R11RTN  B     SELECT              GO SELECT AGAIN
   1797 C0 87 1AB4            1337         B     DOSIO               GO WRITE ERROR PATTERN & INSTR.
   179B 00A3             179C 1338         DC    AL2(R11P3E-R11P3)
   179D 431F             179E 1339         DC    AL2(XMITE)
   179F 3E53             17A0 1340         DC    AL2(R11P3E)
   17A1 C0 87 2118            1341         B     TRESP1              GO CHECK CORRECT RESPONSE
   17A5 C0 87 1735            1342 R11PA   B     R11POL              GO POLL DEVICE TO GET RESPONSE
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   17A9 3D 7D 2659            1343        CLI   AID,X'7D'           CHECK FOR ENTER
   17AD F2 81 10              1344        JE    R11ERR              EXIT IF SO
   17B0 3D 6E 2659            1345        CLI   AID,X'6E'           WAS AID CNCL
   17B4 C0 01 17A5            1346        BNE   R11PA               GO POLL AGAIN
   17B8 3D 00 2661            1347        CLI   SAVAID,0            WAS ORGINAL AID TEST REQ?
   17BC C0 81 0216            1348        BE    LINK                NEXT ROUTINE IF SO
   17C0 C0 87 0000            1349 R11ERR B     *-*                 RETURN TO USER
                              1350 ********************************************************************
                              1351 *      THIS ROUTINE PUTS OUT AN END OF TEST MESSAGE ON THE DEVICE     *
                              1352 ********************************************************************
                              1353
   17C4 12                 17C4 1354 RTN12  DC    XL1'12'             START OF ROUTINE 12
   17C5 00                 17C5 1355        DC    XL1'00'
   17C6 1806               17C7 1356        DC    AL2(RTN13)          POINT TO EXCERCISER
                           17D7 1357
   17C8 C0 87 19F9            1358        B     SETUP               GO DO HOUSEKEEPING
   17CC C0 87 021A            1359        B     PRINT               GO PRINT RTN HEADING
   17D0 06                 17D0 1360        DC    XL1'06'
   17D1 24                 17D1 1361        DC    IL1'36'
   17D2 2884               17D3 1362        DC    AL2(HEAD12)
   17D4 0C 01 3E70 25CF       1363        MVC   EJMG(2),DEVICE      PUT DEVICE IN PATTERN
   17DA C0 87 1C9A            1364        B     SELECT              GO SELECT
   17DE C0 87 1AB4            1365        B     DOSIO               GO WRITE PATTERN
   17E2 001D               17E3 1366        DC    AL2(R12PE-R12P)
   17E4 431F               17E5 1367        DC    AL2(XMITE)
   17E6 3E71               17E7 1368        DC    AL2(R12PE)
   17E8 C0 87 2118            1369        B     TRESP1              GO CHECK RESPONSE
   17EC C0 87 1AB4            1370        B     DOSIO               GO SEND EOT
   17F0 0000               17F1 1371        DC    XL2'00'
   17F2 4201               17F3 1372        DC    AL2(XMITRC+1)
   17F4 2636               17F5 1373        DC    AL2(EOT-1)
                              1374
   17F6 C0 87 17FA            1375        B     ENDRT
   17FA 3C 00 0A03            1376 ENDRT  MVI   PRTN,0              RESET PRESENT ROUTINE NUMBER
   17FE 3C FF 260E            1377        MVI   RESTFL,X'FF'        SET FLAG TO DENOTE PGM LOOP
   1802 C0 87 0000            1378        B     X'0'                RESTART AT ADDR 0
                              1379 ********************************************************************
                              1380 *      THIS ROUTINE IS A MANUALLY SELECTED EXCERCISE.  IT WRITES AND  *
                              1381 *      READS RIPPLE DATA TO AND FROM THE DEVICE.  THE CURSOR POS. AND *
                              1382 *      THE DATA ARE CHANGED EACH PASS THROUGH.  THIS ROUTINE WILL     *
                              1383 *      LOOP CONTINOUSLY ONCE IT IS ENTERED.                           *
                              1384 ********************************************************************
                              1385
   1806 13                 1806 1386 RTN13  DC    XL1'13'             ROUTINE 13
   1807 00                 1807 1387        DC    XL1'00'
   1808 FFFF               1809 1388        DC    XL2'FFFF'
                              1389
   180A C0 87 19F9            1390        B     SETUP               GO DO INITIAL HOUSEKEEPING
   180E 0C 07 4207 4015       1391        MVC   XMITRC+7(8),EXBUF+1 INITIALIZE XMIT/REC FIELD
   1814 0F 01 4130 4130       1392        SLC   HEXADR(2),HEXADR    RESET HEX ADDR TO BE USED
   181A 0C 01 4134 4132       1393        MVC   CURRIP(2),RIPST     POINT TO START OF RIPPLE DATA
   1820 C2 01 4243            1394        LA    XMITRC+67,XR1       POINT XR1 TO 1ST DATA POSITION
   1824 3C DF 2FF9            1395        MVI   WORK,X'DF'          SET UP COUNTER
   1828 4C 38 00 4176         1396 FILAGN MVC   0(60,XR1),EXRIPE     FILL XMIT/REC FIELD WITH RIPPLE DATA
   182D D2 01 3C              1397        LA    60(,XR1),XR1        INCREMENT TO NEXT 60
   1830 0E 00 2FF9 262D       1398        ALC   WORK(1),ONE         INCREMENT COUNTER
   1836 C0 20 1828            1399        BNOL  FILAGN              LOOP TILL FIELD IS FULL
   183A 0C 01 417B 4179       1400        MVC   EADR(2),EMOD2       SET UP FOR MOD 2
   1840 0C 01 188A 417F       1401        MVC   PLENG(2),MOD2L      INSERT MODEL 2 LENGTH
   1846 38 80 2FFD            1402        TBN   RTNFLG,X'80'        TEST FOR MODEL 2
   184A F2 10 10              1403        JT    SM2                 JUMP IF SO
   184D 3C 03 43E8            1404        MVI   XMITRC+488,3        SET MODEL 1 ETX
   1851 0C 01 417B 413A       1405        MVC   EADR(2),EMOD1       SET MODEL 1 END ADDR.
   1857 0C 01 188A 417D       1406        MVC   PLENG(2),MOD1L      INSERT MODEL 1 LENGTH
   185D 3C 03 4988            1407 SM2    MVI   XMITRC+1928,3       SET MODEL 2 ETX
   1861 0C FF 412E 4320       1408        MVC   EXBUF(256),FILL     SAVE THE WRITE BUFFER
   1867 0C 20 402E 4220       1409        MVC   EXBUF+26(33),XMITRC+32
   186D 3C FF 4320            1410        MVI   FILL,X'FF'          RESTORE FILL CHARACTER
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1411
   1871 C0 87 1C9A            1412 LOOP13 B     SELECT              GO SELECT THE DEVICE
   1875 C0 87 18E1            1413        B     CONVER              GO CONVERT ADDRESS
   1879 0C FF 4320 412E       1414        MVC   FILL(256),EXBUFE    RESTORE XMIT/REC FIELD FOR WRITE
   187F 0C 20 4220 402E       1415        MVC   XMITRC+32(33),EXBUF+26
                              1416
   1885 C0 87 1AB4            1417        B     DOSIO               GO WRITE ENTIRE BUFFER
   1889 0000               188A 1418 PLENG  DC    XL2'0000'           PATTERN LENGTH
   188B 49C4               188C 1419        DC    AL2(XMITRC+1988)
   188D 4980               188E 1420        DC    AL2(XMITRC+1920)
                              1421
   188F C0 87 2118            1422        B     TRESP1              GO TEST CORRECT RESPONSE
                              1423
   1893 0C FF 412E 4320       1424 SAVEX  MVC   EXBUFE(256),FILL     SAVE XMIT/REC FIELD
   1899 0C 20 402E 4220       1425        MVC   EXBUF+26(33),XMITRC+32
   189F 3C FF 4320            1426        MVI   FILL,X'FF'          RESTORE FILL CHAR
                              1427
   18A3 C0 87 1C9A            1428        B     SELECT              GO RESELECT
   18A7 C0 87 1DBB            1429        B     READBF              GO READ BUFFER
   18AB 02                 18AB 1430        DC    XL1'02'
   18AC 0000               18AD 1431 CONADR DC    XL2'00'             EXPECTED CURSOR ADDRESS
                              1432
   18AE 0F 01 4134 262D       1433        SLC   CURRIP(2),ONE       UPDATE RIPPLE START ADDRESS
   18B4 0D 01 4134 4136       1434        CLC   CURRIP(2),RIPEND    AT END YET?
   18BA F2 01 06              1435        JNE   UPHEX
   18BD 0C 01 4134 4138       1436        MVC   CURRIP(2),RIPRST    REINITIALIZE RIPPLE ADDRESS
   18C3 0E 01 4130 262D       1437 UPHEX  ALC   HEXADR(2),ONE        INCREMENT HEX ADDRESS
   18C9 0D 01 417B 4130       1438        CLC   EADR(2),HEXADR      ARE WE DONE?
   18CF C0 01 1871            1439        BNE   LOOP13              LOOP IF NOT
   18D3 0F 01 4130 4130       1440        SLC   HEXADR(2),HEXADR    RESET HEX ADDRESS
   18D9 C0 87 0212            1441        B     TEST                GO CHECK CONSOLE SWITCHES
   18DD C0 87 1871            1442        B     LOOP13              RESTART
                              1443
                              1443
                              1443
                              1444 *      SUBROUTINE TO CONVERT HEX ADDR TO GRAPHIC ADDR
                              1445
   18E1 34 08 1958            1446 CONVER ST    CONVR+3,ARR         STORE RETURN ADDRESS
   18E5 0C 00 18AD 4130       1447        MVC   CONADR(1),HEXADR    MOVE LOW BYTE
   18EB 3B 80 18AD            1448        SBF   CONADR,X'80'        FORCE HI BIT OFF
   18EF 3A 40 18AD            1449        SBN   CONADR,X'40'        FORCE BIT 1 ON
                              1450
   18F3 0C 01 2FF9 4130       1451        MVC   WORK(2),HEXADR      MOVE HEX ADDR TO WORK SPACE
   18F9 0E 01 2FF9 2FF9       1452        ALC   WORK(2),WORK        SHIFT LEFT 2 BITS
   18FF 0E 01 2FF9 2FF9       1453        ALC   WORK(2),WORK
   1905 3B E0 2FF8            1454        SBF   WORK-1,X'E0'        RESET HI 3 BITS
   1909 3A 40 2FF8            1455        SBN   WORK-1,X'40'        FORCE BIT 1 ON
   190D 0C 00 18AC 2FF8       1456        MVC   CONADR-1(1),WORK-1  MOVE HI BYTE OF ADDRES
   1913 3C 00 2FF9            1457        MVI   WORK,0              USE WORK AS INDICATOR
   1917 C2 01 18AC            1458        LA    CONADR-1,XR1        POINT XR1 TO HI BYTE
   191B 79 0F 00              1459 XLATE  TBF   0(,XR1),X'0F'       ARE ALL LO BITS OFF
   191E F2 10 18              1460        JT    LOZER               JUMP IF SO
   1921 78 08 00              1461        TBN   0(,XR1),X'08'       BIT 4 ON?
   1924 F2 90 06              1462        JF    D1TO9               LO BITS = 1 TO 7 IF NOT
   1927 79 06 00              1463        TBF   0(,XR1),X'06'       BIT 2,3 OFF?
   192A F2 90 13              1464        JF    TLDN                TRANSLATE DONE IF NOT
   192D 7D 61 00              1465 D1TO9  CLI   0(,XR1),X'61'       TEST FOR 61
   1930 F2 81 0D              1466        JE    TLDN                DONE IF SO
   1933 7A 80 00              1467 SETHIN SBN   0(,XR1),X'80'       FORCE HI BIT ON
   1936 F2 87 07              1468        J     TLDN                DONE
   1939 78 70 00              1469 LOZER  TBN   0(,XR1),X'70'       TEST BITS 1,2,3 ON
   193C C0 10 1933            1470        BT    SETHIN              IF SO, SET HI BIT ON
   1940 D2 01 01              1471 TLDN   LA    1(,XR1),XR1         POINT XR1 TO NEXT BYTE
   1943 3D 00 2FF9            1472        CLI   WORK,0              IS THIS FIRST PASS THRU
   1947 3C FF 2FF9            1473        MVI   WORK,X'FF'          INDICATE SECOND PASS
   194B C0 81 1918            1474        BE    XLATE               REPEAT IF 1ST PASS
   194F 0C 01 4014 18AD       1475        MVC   EXBUF(2),CONADR     PUT CONVERTED ADDRESS IN WRITE CMD
   1955 C0 87 0000            1476 CONVR  B     *-*                 RETURN TO USER
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1478 ************************************
                         1479 *  SUBROUTINE TO INCREMENT DEVICES  ************************************
                         1480 ************************************
                         1481
                         1482 UPDATE ST    UPDR+3,ARR          STORE RETURN ADDRESS
                         1483 RINXR2 LA    *-*,XR2             REINITIALIZE XR2
                         1484        MVI   CONFLG,0            RESET THE CONFIG. FLAG
                         1485 GOUP   ALC   CURDEV(2),DEVINC    UPDATE CURRENT DEVICE ADDRESS
                         1486        TBN   LINE,X'80'          TEST FOR 1ST LINE SELECT
                         1487        JF    T2
                         1488        SBN   CURDEV,X'80'        CHANGE HI BITS TO C OR D
                         1489        SBN   CURDEV-1,X'80'
                         1490 T2     TBN   CURDEV,X'0A'        ARE LO BITS OF ADDR = A
                         1491        TBF   CURDEV,X'05'
                         1492        JF    T3                  JUMP IF NOT
                         1493        SBF   CURDEV,X'80'        CHANGE HI BITS TO 4 OR 5
                         1494        SBF   CURDEV-1,X'80'
                         1495 T3     TBN   LINE,X'01'          ARE WE AT THE LAST LINE BIT
                         1496        JF    T4
                         1497        LA    1(,XR2),XR2         INCREMENT XR2 TO NEXT FLAG BYTE
                         1498        ST    RINXR2+3,XR2        SAVE THE ADDRESS
                         1499        MVI   LINE,X'80'          START AT BIT 0 AGAIN
                         1500        J     ADDOK
                         1501 T4     CLI   CURDEV,X'5E'        DID WE JUST DO LAST DEVICE
                         1502        JNE   DEVOK               JUMP IF NOT
                         1503        MVI   DONE,X'FF'          SET THE DONE FLAG
                         1504        J     UPDR                EXIT
                         1505 DEVOK  MVI   LINE-1,X'02'        LOAD THE SHIFT STOPPER
                         1506 SHIFTR ALC   LINE(2),LINE        SHIFT LINE LEFT
                         1507        BNOL  SHIFTR              BRANCH TIL OFLO OCCURS
                         1508        MVC   LINE(1),LINE-1      LINE IS NOW SHIFTED RIGHT ONE BIT
                         1509 ADDOK  LA    LINE,XR1            POINT XR1 TO LINE POINTER
                         1510        MVC   SF1+1,0(1,XR1)      SET IMMEDIATE INSTRUCTIONS
                         1511        MVC   TDO1+1,0(1,XR1)
                         1512
                         1512
19D2 C0 87 021E          1513        B     UNPACK              UNPACK THE DEVICE CODE
19D6 01            19D6  1514        DC    IL1'1'
19D7 2605          19D8  1515        DC    AL2(CURDEV)
19D9 25CF          19DA  1516        DC    AL2(DEVICE)
19DB 0C 01 256A 25CF     1517        MVC   LOGDEV(2),DEVICE    MOVE DEVICE TO LOG OUT FIELD
19E1 0C 01 31AE 25CF     1518        MVC   A1(2),DEVICE        INITIALIZE DEVICE IN TEST PATTERNS
19E7 34 02 1960          1519        ST    RINXR2+3,XR2        STORE XR2 VALUE
                         1520
19EB B8 00 00            1521 TDO1   TBN   0(,XR2),*-*         TEST DOING THIS DEVICE
19EE F2 10 04            1522        JT    UPDR                OKAY IF SO
19F1 C0 87 1965          1523        B     GOUP                SET UP FOR NEXT
                         1524
19F5 C0 87 0000          1525 UPDR   B     *-*                 RETURN TO USER
                         1526
                         1526
                         1527 ************************************************************
                         1528 *  SUBROUTINE TO DO INITIAL HOUSEKEEPING IN EACH ROUTINE ***********
                         1529 ************************************************************
                         1530
19F9 34 08 1A40          1531 SETUP  ST    SETUPR+3,ARR        STORE RETURN
19FD 3C 00 3FFB          1532        MVI   MICPFL,0            RESET MICRO POLL FLAG IF LEFT ON
1A01 3C FF 4320          1533        MVI   FILL,X'FF'          REINITIALIZE FILL CHAR FOR XMIT/REC
1A05 3D 00 3C3A          1534        CLI   STFLG,0             WAS STG MODIFIED?
1A09 C0 01 1A52          1535        BNE   FIXST               GO FIX IT IF SO
1A0D 3D 02 0A03          1536        CLI   PRTN,2              TEST AT RTN 02
1A11 F2 04 15            1537        JNH   TRDY                JUMP IF RTN 01 OR 02
1A14 3D 00 2660          1538        CLI   CONFLG,0            WAS DEVICE CONFIG FLAG SET
1A18 F2 01 0E            1539        JNE   TRDY                JUMP IF SO
1A1B C0 87 021A          1540        B     PRINT
1A1F 86            1A1F  1541        DC    XL1'86'             PRINT WARNING MESSAGE
1A20 28            1A20  1542        DC    IL1'43'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

1A21 268E                1A22 1543        DC    AL2(WARN)
1A23 C0 87 0222          1544        B     HALT                GO HALT
1A27 89FE                1A28 1545        DC    XL2'89FE'           HALT FE
                         1546
1A29 C1 58 1A30          1547 TRDY   TIO   NORDY,NOTRDY        TEST MICRO CONTROLLER RUNNING
1A2D F2 87 06            1548        J     MICRON              JUMP IF RUNNING
1A30 F3 58 80            1549 NORDY  SIO   X'80',SIOI          DISABLE ATTACHMENT
1A33 F3 58 E0            1550        SIO   X'E0',SIOI          ENABLE, START MICRO
1A36 F3 88 C0            1551 MICRON SIO   ENABLE,CNTRL        ENABLE DA
1A39 35 A0 2616          1552        L     AINT2,IAR2          LOAD INTERRUPT ADDRESS REG
1A3D C0 87 0000          1553 SETUPR B     *-*                 RETURN TO USER
                         1554 ************************************************************
                         1555 *  SUBROUTINE TO MODIFY OR RESTORE WORD 01FE OF MICRO CODE **********
                         1556 ************************************************************
                         1557
1A41 34 08 1AAB          1558 MODST  ST    MODSTR+3,ARR        STORE RETURN FOR MODIFYING MICRO
1A45 0C 01 1A87 3C6E     1559        MVC   MODIFY+3(2),ASSN6   GET ADDRESS OF SSN6 WORD
1A4B 3C FE 3C3A          1560        MVI   STFLG,X'FE'         SET FLAG TO INDICATE MODIFIED
1A4F F2 87 0E            1561        J     DISABL
                         1562
1A52 34 08 1AAB          1563 FIXST  ST    MODSTR+3,ARR        STORE RETURN FOR RESTORING MICRO
1A56 0C 01 1A87 3C70     1564        MVC   MODIFY+3(2),ABDGRT  SET ADDRESS OF RESTORE WORD
1A5C 3C 01 3C3A          1565        MVI   STFLG,X'01'         SET TO INDICATE BEING RESTORED
1A60 F3 58 80            1566 DISABL SIO   X'80',SIOI          DISABLE
1A63 F3 58 C0            1567        SIO   X'C0',SIOI          ENABLE ATTACHMENT
1A66 0F 01 2FF9 2FF9     1568        SLC   WORK(2),WORK        SET WORK SPACE TO ZERO
1A6C 30 58 3C33          1569 SNSLP  SNS   SNSARE,CTRSTG       SENSE TO INCREMENT ADDRESS
1A70 0E 01 2FF9 262D     1570        ALC   WORK(2),ONE          INCREMENT COUNTER
1A76 C1 5D 1AAC          1571        TIO   OOPS4,ATTCHK        TEST FOR ATTACHMENT CHECK
1A7A 0D 01 2FF9 3C35     1572        CLC   WORK(2),X01FE       DID WE GET TO THE ADDR YET?
1A80 C0 01 1A6C          1573        BNE   SNSLP               LOOP TIL WE DO
1A84 31 58 0000          1574 MODIFY LIO   *-*,CTRSTG          DATA AT 01FE GETS CHANGED
1A88 30 58 3C39          1575        SNS   BDGRTN,CTRSTG       GET CONTENTS OF WORD AT 01FF
1A8C C1 5D 1AAC          1576        TIO   OOPS4,ATTCHK        TEST FOR ATTACHMENT CHECK
1A90 38 01 3C3A          1577        TBN   STFLG,X'01'         CHECK FOR RESTORE
1A94 3C FF 3C3A          1578        MVI   STFLG,X'FF'
1A98 F2 90 04            1579        JF    ENABL               JUMP IF MODIFYING STG.
1A9B 3C 00 3C3A          1580        MVI   STFLG,0             INDICATE STG OKAY AGAIN
1A9F F3 58 80            1581 ENABL  SIO   X'80',SIOI          DISABLE AGAIN
1AA2 F3 58 E0            1582        SIO   X'E0',SIOI          START MICROCONTROLLER AGAIN
1AA5 F3 88 C0            1583        SIO   ENABLE,CNTRL        GO ENABLE BSCA
1AA8 C0 87 0000          1584 MODSTR B     *-*                 RETURN TO USER
                         1585
1AAC 3C 05 262A          1586 OOPS4  MVI   ERR,ATTCH           SET ATTACHMENT CHECK
1AB0 C0 87 22A7          1587        B     ERROR
                         1588 ************************
                         1589 *  DO SIO SUBROUTINE  ************************************************
                         1590 ************************
                         1591
1AB4 34 08 1B84          1592 DOSIO  ST    DOSIOR+3,ARR        STORE RETURN ADDRESS
1AB8 34 02 1B80          1593        ST    REST2+3,XR2         STORE XR2
1ABC 35 01 1B84          1594        L     DOSIOR+3,XR1        POINT XR1 AT PARAMETERS
1AC0 0C 25 2590 2591     1595        MVC   LOGMSG(38),MSGBLK   BLANK OUT THE MESSAGE FIELD
1AC6 0C 01 256A 25CF     1596        MVC   LOGDEV(2),DEVICE    INSERT THE DEVICE IN MESSAGE
1ACC 0C 07 2590 2B06     1597        MVC   LOGMSG(8),NOERR     MOVE IN NO ERROR MESSAGE
1AD2 0C 03 259E 2657     1598        MVC   LOGST(4),XXXX       'X' OUT DATA
1AD8 0C 03 25A8 2657     1599        MVC   LOGCAR(4),XXXX
1ADE 0C 03 25B2 2657     1600        MVC   LOGTAR(4),XXXX
1AE4 0C 03 25BC 2657     1601        MVC   LOGSAR(4),XXXX
1AEA 0C 01 261C 261A     1602        MVC   LTAR(2),LCAR        PUT INITIAL CAR INTO TAR LOAD AREA
1AF0 1E 01 261C 01       1603        ALC   LTAR,1(2,XR1)       ADD IN THE DISPLACEMENT
1AF5 0E 01 261C 262D     1604        ALC   LTAR(2),ONE         ADD 1 MORE
1AFB 1C 01 261E 03       1605        MVC   LSAR,3(2,XR1)       MOVE IN THE SAR ADDRESS
1B00 C2 02 4200          1606        LA    XMITRC,XR2          PUT ADDR OF TRANSMIT/RECEIVE FIELD
                         1607 *                                 INTO XR2
1B04 7D 00 00            1608        CLI   0(,XR1),0           TEST FOR XMITRC ALL SET(LENGTH IS
1B07 F2 01 20            1609        JNE   DATIN                GREATER THAN 256)
1B0A 1C 01 1B29 05       1610        MVC   MVDATA+4,5(2,XR1)   MOVE IN DATA ADDRESS
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    1B0F 1C 00 1B26 01        1611         MVC   MVDATA+1,1(1,XR1)     MOVE IN THE LENGTH
    1B14 1C 00 1B27 01        1612         MVC   MVDATA+2,1(1,XR1)     MOVE IN THE DISPLACEMENT
    1B19 0C FF 431F 4320      1613         MVC   FILL-1(256),FILL      FILL WHOLE XMIT/REC FIELD WITH 'FF'
    1B1F 0C 1F 4220 4221      1614         MVC   XMITRC+32(32),XMITRC+33
    1B25 8C 00 00 0000        1615 MVDATA  MVC   *-*(*-*,XR2),*-*      MOVE XMIT DATA TO XMIT/REC. FIELD
    1B2A 3C C0 2611           1616 DATIN   MVI   BCNT-1,X'C0'          RESET THE BUSY COUNTER
    1B2E 3C FF 2610           1617         MVI   INTFLG,X'FF'          SET INT FLG TO 'NO INTERRUPT'
    1B32 3C 00 262A           1618         MVI   ERR,0                 SET ERROR FLAG TO ZERO
    1B36 F3 88 02             1619         SIO   ENINTR,CNTRL          SIO TO ENABLE INTERRUPTS TO CATCH
                              1620 *                                     ANY ATTACHMENT CHECKS
    1B39 31 8C 261A           1621         LIO   LCAR,CAR              LOAD THE CAR
    1B3D 31 8A 261C           1622         LIO   LTAR,TAR              LOAD THE TAR
    1B41 31 89 261E           1623         LIO   LSAR,SAR              LOAD THE SAR
    1B45 C1 58 1BAA           1624 TSTRDY  TIO   DROPED,NOTRDY          CHECK MICROCONTROLLER STILL RUNNING
                              1625
    1B49 F3 8A 02             1626         SIO   ENINTR,XMITR          SIO TO TRANSMIT/REC., ENABLE INTR.
                              1627
    1B4C C1 8A 1B85           1628 BUSYB   TIO   EXIT,BUSY             TEST BUSY
    1B50 30 8C 2620           1629         SNS   SCAR,CAR              SENSE THE CAR
    1B54 30 8A 2622           1630         SNS   STAR,TAR              SENSE THE TAR
    1B58 30 89 2624           1631         SNS   SSAR,SAR              SENSE THE SAR
    1B5C 30 8B 2626           1632         SNS   SSTAT,STATUS          SENSE THE STATUS
    1B60 35 01 261C           1633         L     LTAR,XR1              POINT XR1 TO RECEIVE FIELD
    1B64 3D 00 2610           1634         CLI   INTFLG,0              DID THE INTERRUPT OCCUR YET?
    1B68 F2 81 04             1635         JE    TSTERR                JUMP IF SO
    1B6B 3C 07 262A           1636 SIONIN  MVI   ERR,NOINT             SET NO INTERRUPT ERROR
    1B6F 3D 00 262A           1637 TSTERR  CLI   ERR,0                 TEST FOR NO ERROR
    1B73 C0 01 22A7           1638         BNE   ERROR                 BRANCH IF ERROR OCCURRED
    1B77 0E 01 1B84 2631      1639         ALC   DOSIOR+3(2),SIX       UPDATE RETURN ADDRESS
    1B7D C2 02 0000           1640 REST2   LA    *-*,XR2               RESTORE XR2
    1B81 C0 87 0000           1641 DOSIOR  B     *-*                   RETURN TO USER
                              1642
                              1642
    1B85 3D F0 3FFB           1643 EXIT    CLI   MICPFL,X'F0'          DOING MICRO POLL?
    1B89 C0 81 1B6F           1644         BE    TSTERR                EXIT IF SO
    1B8D 0E 01 2612 262D      1645         ALC   BCNT(2),ONE           ADD TO BUSY COUNTER
    1B93 C0 A0 1BA2           1646         BOL   BSYERR                ERROR AFTER ABOUT 1 SEC.
    1B97 3D 00 2610           1647         CLI   INTFLG,0              DID AN INTERRUPT OCCUR YET?
    1B9B F2 81 1C             1648         JE    GOTIT                 JUMP IF SO
    1B9E C0 87 1B4C           1649         B     BUSYB                 GO CHECK BUSY AGAIN
                              1650
    1BA2 3C 02 262A           1651 BSYERR  MVI   ERR,BUSE              SET BUSY TOO LONG INDICATION
    1BA6 C0 87 22A7           1652         B     ERROR                 GO TO ERROR ROUTINE
                              1653
    1BAA 3D 00 262A           1654 DROPED  CLI   ERR,0                 DID AN ERROR OCCUR
    1BAE C0 01 22A7           1655         BNE   ERROR                 IF SO, GO TO ERROR ROUT.
    1BB2 3C 0A 262A           1656         MVI   ERR,ATNR              SET ATTACH. NOT READY ERROR
    1BB6 C0 87 22A7           1657         B     ERROR
                              1658
    1BBA 3D 00 262A           1659 GOTIT   CLI   ERR,0                 DID AN ERROR OCCUR YET?
    1BBE C0 81 1B4C           1660         BE    BUSYB                 IF NOT, GO ON
    1BC2 C0 87 22A7           1661         B     ERROR                 GO TO ERROR
                              1662 *************************
                              1663 *  SEND ACK 1 SUBROUTINE  ***************************************************
                              1664 *************************
                              1665
    1BC6 34 08 1BF7           1666 GOACK   ST    GOACKR+3,ARR          STORE RETURN ADDRESS
    1BCA C0 87 1AB4           1667         B     DOSIO                 SEND ACK 1 TO DEVICE
    1BCE 0001           1BCF  1668         DC    AL2(ACK1-ACK1+1)
    1BD0 431F           1BD1  1669         DC    AL2(XMITE)
    1BD2 263F           1BD3  1670         DC    AL2(ACK1)
                              1671
    1BD4 4D 01 01 2637        1672         CLC   1(2,XR1),EOT          TEST RESPONSE = EOT
    1BD9 F2 81 18             1673         JE    GOACKR                EXIT IF SO, ALL OKAY
    1BDC 3C 10 262A           1674         MVI   ERR,INCOR             SET INCORRECT RESPONSE
    1BE0 C0 87 1FD5           1675         B     FILLFF                GO SET EXP RESULTS TO FF
    1BE4 0C 01 2D74 263F      1676         MVC   EXPBUF+1(2),ACK1      SET EXP RESULTS
    1BEA 0C 01 2D76 2637      1677         MVC   EXPBUF+3(2),EOT
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    1BF0 C0 87 22A7           1678         B     ERROR
                              1679
    1BF4 C0 87 0000           1680 GOACKR B     *-*                   RETURN TO USER
                              1681 ****************************************
                              1682 *  SUBROUTINE TO FILL EXP. RESULTS BUFFER ****************************
                              1683 ****************************************
                              1684
    1BF8 34 08 1C38           1685 SETEXP ST    SETEXR+3,ARR          STORE RETURN ADDRESS
    1BFC 34 01 1C30           1686         ST    MVXR1+3,XR1           SAVE XR1
    1C00 34 02 1C34           1687         ST    MVXR2+3,XR2           SAVE XR2
    1C04 C2 02 2D73           1688         LA    EXPBUF,XR2            POINT XR2 TO EXP BUFF
    1C08 C2 01 4200           1689         LA    XMITRC,XR1            POINT XR1 TO XMIT/REC. FIELD
    1C0C C0 87 1FD5           1690         B     FILLFF                FILL EXP. RESULTS BUFFER WITH FF
                              1691
    1C10 9C 00 00 00          1692 MVCHR   MVC   0(1,XR2),0(,XR1)      MOVE XMIT/REC FIELD TO EXP RESULTS
    1C14 D2 01 01 01          1693         LA    1(,XR1),XR1           INCREMENT POINTERS
    1C17 E2 02 01             1694         LA    1(,XR2),XR2
    1C1A 34 01 2FF9           1695         ST    WORK,XR1              SAVE XR1
    1C1E 0D 01 2FF9 1C30      1696         CLC   WORK(2),MVXR1+3       TEST FOR END OF MOVE
    1C24 C0 01 1C10           1697         BNE   MVCHR                 IF NOT, MOVE ANOTHER
    1C28 8C 01 01 2FFB        1698         MVC   1(2,XR2),ACK          MOVE IN CORRECT ACK
    1C2D C2 01 0000           1699 MVXR1   LA    *-*,XR1               RESTORE XR1
    1C31 C2 02 0000           1700 MVXR2   LA    *-*,XR2               RESTORE XR2
    1C35 C0 87 0000           1701 SETEXR B     *-*                   RETURN TO USER
                              1702 *************************
                              1703 *  DO POLL SUBROUTINE  ******************************************************
                              1704 *************************
                              1705
                              1706 *  SETS UP THE FOLLOWING 4 BYTES AS FOLLOWS:
                              1707 *  BYTE 1  POLFLG  BIT 0 = 1 = EOT WAS RECEIVED
                              1708 *                  BIT 1 = 1 = AID KEY WAS DEPRESSED
                              1709 *                  BIT 2 = 1 = TEST REQ. WAS DEPRESSED
                              1710 *                  BIT 3 = 1 = STATUS WAS RECEIVED
                              1711 *  BYTE 2 AID - CONTAINS THE AID CHAR IF BIT 1 OF BYTE 1 IS ON
                              1712 *  BYTES 3 & 4 POLST CONTAIN STATUS IF BIT 3 OF BYTE 1 WAS ON
                              1713
    1C39 34 08 1C99           1714 DOPOL   ST    DOPOLR+3,ARR          STORE THE RETURN ADDRESS
    1C3D 0C 01 25F8 2651      1715         MVC   SPFLD(2),POLL         SET UP POLL
    1C43 0C 01 25FA 2605      1716         MVC   PSDEV(2),CURDEV       SET UP DEVICE
    1C49 0F 03 265B 265B      1717         SLC   POLST(4),POLST        CLEAR POLL STATUS, AID, & FLAGS
    1C4F C0 87 0212           1718         B     TEST                  GO CHECK CONSOLE SWITCHES
                              1719
    1C53 C0 87 1AB4           1720         B     DOSIO                 GO DO THE POLL
    1C57 0008           1C58  1721         DC    AL2(ENQ-SELPOL)
    1C59 431F           1C5A  1722         DC    AL2(XMITE)
    1C5B 25F8           1C5C  1723         DC    AL2(ENQ)
                              1724
    1C5D 7D 37 00             1725         CLI   0(,XR1),X'37'         WAS RESPONSE EOT?
    1C60 F2 01 07             1726         JNE   TSTAT                 JUMP IF NOT
    1C63 3A 80 2658           1727         SBN   POLFLG,X'80'          SET THE EOT BIT ON
    1C67 F2 87 2C             1728         J     DOPOLR                RETURN
    1C6A 4D 02 02 264C        1729 TSTAT   CLC   2(3,XR1),STATR          TEST FOR STATUS RECEIVED
    1C6F F2 01 0C             1730         JNE   TTR                   IF NOT GO CHECK TST REQ
    1C72 1C 01 265B 07        1731         MVC   POLST,7(2,XR1)        FETCH THE POLL STATUS
    1C77 3A 10 2658           1732         SBN   POLFLG,X'10'          SET THE STATUS BIT
    1C7B F2 87 18             1733         J     DOPOLR                EXIT
    1C7E 4D 02 02 264F        1734 TTR     CLC   2(3,XR1),TSTREQ       CHECK FOR TEST REQUEST
    1C83 F2 01 07             1735         JNE   STAID                 IF NOT, GO STORE AID
    1C86 3A 20 2658           1736         SBN   POLFLG,X'20'          SET TST REQ FLAG ON
    1C8A F2 87 09             1737         J     DOPOLR                EXIT
    1C8D 1C 00 2659 03        1738 STAID   MVC   AID,3(1,XR1)          FETCH THE AID CHARACTER
    1C92 3A 40 2658           1739         SBN   POLFLG,X'40'          SET THE AID BIT ON
    1C96 C0 87 0000           1740 DOPOLR B     *-*                   RETURN TO USER
                              1741 *************************
                              1742 *  SELECT SUBROUTINE  *******************************************************
                              1743 *************************
                              1744
    1C9A 34 08 1D13           1745 SELECT ST    SELECR+3,ARR          STORE RETURN ADDRESS
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1C9E 0C 01 25F8 2653       1746         MVC   SPFLD(2),SEL          SET UP TO SELECT
   1CA4 0C 01 25FA 2605       1747         MVC   PSDEV(2),CURDEV       SET TO SELECT CURRENT DEVICE
   1CAA C0 87 1AB4            1748         B     DOSIO                 GO SELECT DEVICE
   1CAE 0008            1CAF  1749         DC    AL2(ENQ-SELPOL)
   1CB0 431F            1CB1  1750         DC    AL2(XMITE)
   1CB2 25FB            1CB3  1751         DC    AL2(ENQ)
   1CB4 4D 01 01 263D         1752         CLC   1(2,XR1),ACK0         TEST RESPONSE = ACK0
   1CB9 F2 81 54              1753         JE    SELECR                OKAY IF SO
   1CBC 4D 01 01 263B         1754         CLC   1(2,XR1),RVI          TEST RESPONSE = RVI
   1CC1 F2 81 0F              1755         JE    GETST                 IF SO, GO GET STATUS
   1CC4 4D 01 01 2639         1756         CLC   1(2,XR1),WACK         TEST RESPONSE = WACK
   1CC9 F2 81 31              1757         JE    PWACK
                              1758
   1CCC 34 08 1D13            1759 GETPS   ST    SELECR+3,ARR          STORE RETURN ADDRESS
   1CD0 F2 87 04              1760         J     GOERR
   1CD3 3C 20 262A            1761 GETST   MVI   ERR,RVIS              SET UNEXPECTED STATUS
   1CD7 C0 87 22A7            1762 GOERR   B     ERROR                 GO PRINT RVI OR EOT
   1CDB C0 87 1C39            1763 FETCHS  B     DOPOL                 GO GET STATUS
   1CDF 38 10 2658            1764         TBN   POLFLG,X'10'          WAS STATUS RECEIVED
   1CE3 F2 90 22              1765         JF    OHOH                  BAD IF NOT
                              1766
   1CE6 C0 87 1D27            1767 PSTAT   B     FORMAT                GO PRINT STATUS BITS REC'D
   1CEA C0 87 1BC6            1768         B     GOACK                 GO SEND ACK1
   1CEE C0 87 021A            1769 SP6HLT  B     PRINT                 GO SPACE 6
   1CF2 96                    1770         DC    XL1'96'
   1CF3 C0 87 0222            1771         B     HALT                  GO HALT
   1CF7 891F                  1772         DC    XL2'891F'             HALT  ****1F****
   1CF9 C0 87 0216            1773         B     LINK                  GO TO NEXT ROUTINE
                              1774
   1CFD 3C 0B 262A            1775 PWACK   MVI   ERR,WACKE              SET WACK MESSAGE
   1D01 C0 87 22A7            1776         B     ERROR
   1D05 F2 87 08              1777         J     SELECR
   1D08 3C 0C 262A            1778 OHOH    MVI   ERR,UNK                SET UNKNOWN RESPONSE
   1D0C C0 87 22A7            1779         B     ERROR
                              1780
   1D10 C0 87 0000            1781 SELECR  B     *-*                   RETURN TO USER
                              1782 ************************************
                              1783 *  SUBROUTINE TO PRINT POLL STATUS BITS ****************************
                              1784 ************************************
                              1785
   1D14 34 08 1DA4            1786 PEXPST  ST    FORMRT+3,ARR          STORE RETURN ADDRESS
   1D18 0C 01 2BE5 25CF       1787         MVC   STATME(2),DEVICE      SET UP MESSAGE TO PRINT EXPECTED
   1D1E 0C 1D 2C03 2BE5       1788         MVC   STATFL(30),STATME     MOVE TO MESSAGE
   1D24 F2 87 16              1789         J     FINEXP                JUMP TO FINISH
   1D27 34 08 1DA4            1790 FORMAT  ST    FORMRT+3,ARR          STORE RETURN ADDRESS
   1D2B 0C 01 2BC7 25CF       1791         MVC   STATMS(2),DEVICE      PUT DEVICE IN HEADING
   1D31 0C 1D 2C03 2BC7       1792         MVC   STATFL(30),STATMS     PUT HEADING IN PRINT FIELD
   1D37 0C 01 2FF9 265B       1793         MVC   WORK(2),POLST         MOVE POLL STATUS TO WORK SPACE
   1D3D 34 01 1D9C            1794 FINEXP  ST    FXR1+3,XR1            SAVE XR1
   1D41 34 02 1DA0            1795         ST    FXR2+3,XR2            SAVE XR2
                              1796
   1D45 C0 87 1DA5            1797         B     PSROUT                GO PRINT IT
                              1798
   1D49 3C 01 1D5A            1799         MVI   TBIT+1,1              SET BIT MASK TO START AT BIT 7
   1D4D 3C 01 1D5B            1800         MVI   TBIT+2,1              SET DISPLACEMENT TO 1
   1D51 C2 01 2FF8            1801         LA    WORK-1,XR1            POINT XR1 TO POLL STATUS HI BYTE
   1D55 C2 02 2B1A            1802         LA    STTAB,XR2             POINT XR2 TO BIT NAME TABLE
                              1803
   1D59 78 00 00              1804 TBIT    TBN   *-*(,XR1),*-*         TEST STATUS BIT ON
   1D5C F2 90 09              1805         JF    NEXTB                 IF NOT, UPDATE TO NEXT
   1D5F 2C 0F 2C03 0F         1806         MVC   STATFL,15(16,XR2)     MOVE IN BIT NAME TO MESSAGE
   1D64 C0 87 1DA5            1807         B     PSROUT                GO PRINT IT
                              1808
   1D68 0E 00 1D5A 1D5A       1809 NEXTB   ALC   TBIT+1(1),TBIT+1      SHIFT MASK BIT LEFT ONE
   1D6E E2 02 10              1810         LA    16(,XR2),XR2          UPDATE XR2 TO POINT TO NEXT ENTRY
   1D71 3D 01 1D5B            1811         CLI   TBIT+2,1              ARE WE DOING HI BYTE YET?
   1D75 F2 01 14              1812         JNE   HI                    JUMP IF NOT
   1D78 3D 40 1D5A            1813         CLI   TBIT+1,X'40'          DID WE JUST DO LAST BIT OF LO BYTE
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8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1D7C C0 01 1D59            1814         BNE   TBIT                  IF NOT, GO DO THIS BIT
                              1815
   1D80 3C 00 1D5B            1816         MVI   TBIT+2,0              SET DISPLACEMENT FOR HI BYTE
   1D84 3C 02 1D5A            1817         MVI   TBIT+1,2              SET MASK FOR 1ST BIT OF HI BYTE
   1D88 C0 87 1D59            1818         B     TBIT                  GO TEST NEXT BIT
                              1819
   1D8C 3D 10 1D5A            1820 HI      CLI   TBIT+1,X'10'          AT END YET?
   1D90 C0 01 1D59            1821         BNE   TBIT                  IF NOT, TEST NEXT BIT
                              1822
   1D94 C0 87 021A            1823         B     PRINT                 SPACE 1 LINE
   1D98 91                    1824         DC    XL1'91'
   1D99 C2 01 0000            1825 FXR1    LA    *-*,XR1               RESTORE XR1
   1D9D C2 02 0000            1826 FXR2    LA    *-*,XR2               RESTORE,XR2
   1DA1 C0 87 0000            1827 FORMRT  B     *-*                   RETURN TO USER
                              1828
   1DA5 34 08 1DBA            1829 PSROUT  ST    PSROUR+3,ARR          STORE RETURN ADDRESS
   1DA9 C0 87 021A            1830         B     PRINT                 PRINT LINE
   1DAD 81                    1831         DC    XL1'81'
   1DAE 1E                    1832         DC    IL1'30'
   1DAF 2C03                  1833         DC    AL2(STATFL)
   1DB1 0C 1D 2C03 2C04       1834         MVC   STATFL(30),STATBL     CLEAR PRINT FIELD FOR NEXT ENTRY
   1DB7 C0 87 0000            1835 PSROUR  B     *-*                   RETURN
                              1836 ************************************
                              1837 *  SUBROUTINE TO READ BUFFER  ***************************************
                              1838 ************************************
                              1839 *       B     READBF                BRANCH TO SUBROUTINE
                              1840 *       DC    XL1'XX'               XX = FLAGS
                              1841 *       DC    XL2'AAAA'             AAAA = CURSOR ADDRESS
                              1842 *
                              1843 *       FLAGS   BIT 0 = 1 = PATTERN IS NULLS
                              1844 *               BIT 1 = 1 = PATTERN IS RIPPLE DATA
                              1845 *               BIT 2 = 1 = PATTERN IS A SINGLE CHAR. REPEATED
                              1846 *               BIT 3 = 1 = USING PATTERN 1
                              1847 *               BIT 4 = 1 = USING UPPER/LOWER CASE PATTERN
                              1848 *               BIT 5 = 1 = USING PATTERN 2
                              1849 *               BIT 6 = 1 = DOING RTN 13 EXCERCISE
                              1850 *
   1DB8 34 08 1F5C            1851 READBF  ST    READBR+3,ARR          STORE RETURN ADDRESS
   1DBF C0 87 1FD5            1852         B     FILLFF                FILL EXPECTED BUFFER WITH FF
   1DC3 0C 03 2D76 2603       1853         MVC   EXPBUF+3(4),RDBE      PUT IN EXPECTED RESULTS
   1DC9 34 01 1F4E            1854         ST    RDBXR1+3,XR1          STORE XR1
   1DCD 34 02 1F52            1855         ST    RDBXR2+3,XR2          STORE XR2
   1DD1 35 01 1F5C            1856         L     READBR+3,XR1          GET PARAMETERS ADDR
   1DD5 1C 00 2E94 00         1857         MVC   RBFLG,0(1,XR1)        FETCH FLAGS
   1DDA 1C 01 2D7C 02         1858         MVC   EXPBUF+9,2(2,XR1)     FETCH CURSOR ADDRESS
   1DDF 0C 03 2D7A 2E98       1859         MVC   EXPBUF+7(4),RBEX1     FILL IN READ HEADING
   1DE5 0C 00 2D7A 3098       1860         MVC   EXPBUF+7(1),NDAID     FORCE NO AID CHAR
   1DEB 0C 00 2D79 2605       1861         MVC   EXPBUF+6(1),CURDEV    INSERT DEVICE IN EXP. RESULT
   1DF1 3C 26 2E73            1862         MVI   EXPBUF+256,X'26'      INSERT ETB
   1DF5 3C 01 2FFC            1863         MVI   TCOUNT,1              SET COUNTER TO 1
   1DF9 38 80 2E94            1864         TBN   RBFLG,X'80'           TEST FOR DATA = NULLS
   1DFD F2 10 7E              1865         JT    NULLS
   1E00 38 40 2E94            1866         TBN   RBFLG,X'40'           TEST FOR RIPPLE DATA
   1E04 F2 10 6C              1867         JT    RIPPLE
   1E07 38 20 2E94            1868         TBN   RBFLG,X'20'           TEST FOR SINGLE CHAR WRITTEN
   1E0B F2 10 5A              1869         JT    RAP
   1E0E 38 10 2E94            1870         TBN   RBFLG,X'10'           TEST FOR PATTERN 1
   1E12 F2 10 44              1871         JT    PAT1
   1E15 38 08 2E94            1872         TBN   RBFLG,X'08'           IS THIS UPPER/LOWER CASE PATTERN?
   1E19 F2 10 2E              1873         JT    UPLWR
   1E1C 38 04 2E94            1874         TBN   RBFLG,X'04'           TEST FOR PATTERN 2
   1E20 F2 10 18              1875         JT    PAT2                  JUMP IF SO
   1E23 38 02 2E94            1876         TBN   RBFLG,X'02'           TEST FOR RTN 13 EXERCISE
   1E27 F2 10 00              1877         JT    R13EX
                              1878 *  TEMP --- TO BE FILLED IN FOR OTHERS
   1E2A C2 02 2D7D            1879 R13EX   LA    EXPBUF+10,XR2         POINT XR2 TO 1ST ADDR TO BE FILLED
   1E2E 0C 01 2EF1 4132       1880         MVC   STDAT(2),RIPST        SET UP DATA START ADDRESS
   1E34 35 01 4134            1881         L     CURRIP,XR1            POINT XR1 TO DATA
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    1E38 F2 87 55            1882         J      EXSTR
    1E3B C2 02 2D7D          1883 PAT2    LA     EXPBUF+10,XR2      POINT XR2 TO FIRST CHAR TO BE FILLED
    1E3F C2 01 3BD8          1884         LA     R6EXP2,XR1         POINT XR1 TO EXPECTED DATA
    1E43 3C 00 3818          1885         MVI    SINCHR-1,X'00'     EXPECT FILL TO BE A NULL
    1E47 F2 87 42            1886         J      STFXR1
    1E4A C2 02 2D7D          1887 UPLWR   LA     EXPBUF+10,XR2      POINT XR2 TO FIRST DATA TO BE FILL
    1E4E C2 01 3EA0          1888         LA     R09PS,XR1          LA ADDRESS OF EXPECTED DATA
    1E52 3C 00 3818          1889         MVI    SINCHR-1,0         SET FILL CHAR TO NULL
    1E56 F2 87 33            1890         J      STFXR1
    1E59 C2 02 2D7D          1891 PAT1    LA     EXPBUF+10,XR2      POINT XR2 TO 1ST CHAR TO BE FILLED
    1E5D C2 01 3B88          1892         LA     R6EXP,XR1          POINT XR1 TO PATTERN
    1E61 3C 60 3818          1893         MVI    SINCHR-1,C'-'      SET SINGLE CHAR TO A '-'
    1E65 F2 87 24            1894         J      STFXR1
    1E68 C2 02 2D7D          1895 RAP     LA     EXPBUF+10,XR2      POINT XR2 TO 1ST CHAR TO BE FILLED
    1E6C C2 01 3818          1896         LA     SINCHR-1,XR1       POINT XR1 TO SINGLE CHAR USED
    1E70 F2 87 19            1897         J      STFXR1
    1E73 C2 01 2E99          1898 RIPPLE  LA     RIPDAT,XR1         FETCH ADDR OF RIPPLE TABLE
    1E77 C2 02 2D7D          1899         LA     EXPBUF+10,XR2      POINT XR2 TO 1ST CHAR TO BE FILLED
    1E7B F2 87 0E            1900         J      STFXR1             GO STORE IT
    1E7E C2 01 2EEC          1901 NULLS   LA     NULL,XR1           FETCH ADDR OF NULLS
    1E82 0C 08 2D85 2D6E     1902         MVC    EXPBUF+18(9),DEVRT2 FILL IN 1ST 9 CHAR
    1E88 C2 02 2D86          1903         LA     EXPBUF+19,XR2      POINT XR2 TO 1ST DATA BYTE
    1E8C 34 01 2EF1          1904 STFXR1  ST     STDAT,XR1          STORE IT
    1E90 34 01 2EEF          1905 EXSTR   ST     CURDAT,XR1         INITIALIZE CURRENT DATA ADDR
    1E94 C0 87 1F5D          1906         B      FILTAB             GO FILL EXPECTED RESULTS
                             1907
    1E98 C0 87 1AB4          1908         B      DOSIO              GO READ BUFFER
    1E9C 0003        1E9D    1909         DC     AL2(RDBE-RDB)
    1E9E 431F        1E9F    1910         DC     AL2(XMITE)
    1EA0 2603        1EA1    1911         DC     AL2(RDBE)
                             1912
    1EA2 C0 87 1F9D          1913         B      CHECK1             GO CHECK RESULTS OF READ
    1EA6 0C 01 2FFB 263F     1914 DOACK1  MVC    ACK(2),ACK1        SET TO DO ACK 1
    1EAC C0 87 1FD5          1915 DOACK   B      FILLFF
    1EB0 GE 00 2FFC 262D     1916         ALC    TCOUNT(1),ONE      ADD TO TRANSMISSION COUNTER
    1EB6 0C 01 2D74 2FFB     1917         MVC    EXPBUF+1(2),ACK    SET UP 1ST 2 CHAR = ACK 1 OR 0
    1EBC 3C 26 2E71          1918         MVI    EXPBUF+254,X'26'   INSERT ETB
    1EC0 C2 02 2D76          1919         LA     EXPBUF+3,XR2       POINT XR2 TO START OF DATA
    1EC4 3C 02 2D75          1920         MVI    EXPBUF+2,2         INSER STX
    1EC8 C0 87 1F5D          1921         B      FILTAB             GO SET UP EXPECTED RESULTS
                             1922
    1ECC C0 87 1AB4          1923         B      DOSIO              GO SEND ACK 1 OR 0
    1ED0 0001        1ED1    1924         DC     AL2(ACK-ACK+1)
    1ED2 431F        1ED3    1925         DC     AL2(XMITE)
    1ED4 2FFB        1ED5    1926         DC     AL2(ACK)
                             1927
    1ED6 C0 87 1FB9          1928         B      CHECK2             GO CHECK RESULTS AGAIN
    1EDA 3D 70 2FFB          1929         CLI    ACK,X'70'          TEST FOR ACK 0
    1EDE 3C 70 2FF8          1930         MVI    ACK,X'70'          SET ACK 0
    1EE2 C0 81 1EA6          1931         BE     DOACK1             DO ACK 1 IF LAST WAS ACK 0
    1EE6 C0 87 1EAC          1932         B      DOACK              GO DO ACK 0
                             1933
    1EEA C2 01 4200          1934 CHECK   LA     XMITRC,XR1         SET TO SCAN FOR ETX
    1EEE C2 02 2D73          1935         LA     EXPBUF,XR2
    1EF2 7D 03 00            1936 TETX    CLI    0(,XR1),3          LOOK FOR ETX
    1EF5 F2 81 11            1937         JE     FIX                GO FIX RESULTS IF SO
    1EF8 7D FF 00            1938         CLI    0(,XR1),X'FF'      IS CHAR FF
    1EFB C0 81 1FF0          1939         BE     RDERR              ERROR IF SO
    1EFF D2 01 01            1940         LA     1(,XR1),XR1        INCREMENT POINTER
    1F02 E2 02 01            1941         LA     1(,XR2),XR2
    1F05 C0 87 1EF2          1942         B      TETX               LOOP TILL FF OR 03 FOUND
                             1943
    1F09 BC 03 00            1944 FIX     MVI    0(,XR2),3          INSERT ETX IN EXPECTED RESULTS
    1F0C E2 02 01            1945 LOOP    LA     1(,XR2),XR2        FILL REST WITH FF
    1F0F BD FF 00            1946         CLI    0(,XR2),X'FF'      TEST FOR FF AGAIN
    1F12 F2 81 07            1947         JE     TESTAG             FINISHED IF SO
    1F15 BC FF 00            1948         MVI    0(,XR2),X'FF'      FILL EXP BUFF WITH FF
    1F18 C0 87 1F0C          1949         B      LOOP
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    1F1C C0 87 1F9D          1950 TESTAG B      CHECK1             GO CHECK RESULTS AGAIN
    1F20 C0 87 1FD5          1951         B      FILLFF             GO FILL EXP BUFF WITH 'FF'
    1F24 3D 70 2FFB          1952         CLI    ACK,X'70'          TEST FOR ACK 0
    1F28 3C 70 2FF8          1953         MVI    ACK,X'70'          FORCE ACK 0
    1F2C F2 01 04            1954         JNE    DOACKX             JUMP IF ACK 1
    1F2F 3C 61 2FF8          1955         MVI    ACK,X'61'          OOPS, FORCE ACK 1
    1F33 0C 01 2D74 2FFB     1956 DOACKX  MVC    EXPBUF+1(2),ACK    SET UP ACK
    1F39 3C 37 2D75          1957         MVI    EXPBUF+2,X'37'     SET TO EXPECT EOT RETURNED
                             1958
    1F3D C0 87 1AB4          1959         B      DOSIO              GO SEND LAST ACK
    1F41 0001        1F42    1960         DC     AL2(ACK-ACK+1)
    1F43 431F        1F44    1961         DC     AL2(XMITE)
    1F45 2FFB        1F46    1962         DC     AL2(ACK)
    1F47 C0 87 1F9D          1963         B      CHECK1             GO CHECK FOR CORRECT RESPONSE
                             1964
    1F4B C2 01 0000          1965 RDBXR1  LA     *-*,XR1            RESTORE XR1
    1F4F C2 02 0000          1966 RDBXR2  LA     *-*,XR2            RESTORE XR2
    1F53 0E 01 1F5C 262F     1967         ALC    READBR+3(2),THREE  UPDATE RETURN ADDRESS
    1F59 C0 87 0000          1968 READBR  B      *-*                RETURN TO USER
                             1969
                             1969
    1F5D 34 08 1F9C          1970 FILTAB  ST     FILTR+3,ARR        STORE RETURN
    1F61 35 01 2EEF          1971         L      CURDAT,XR1         POINT XR1 TO CURRENT DATA ADDR
    1F65 BD FF 00            1972 AGAIN   CLI    0(,XR2),X'FF'      TEST FOR END OF PATTERN
    1F68 F2 01 2A            1973         JNE    BLKDN              DONE IF NOT
    1F6B 7D FF 00            1974         CLI    0(,XR1),X'FF'      TEST END OF DATA TABLE
    1F6E F2 81 1C            1975         JE     TDONE
    1F71 7D FE 00            1976         CLI    0(,XR1),X'FE'      TEST FOR SWITCH TO SINGLE CHAR
    1F74 F2 01 08            1977         JNE    MOVE               JUMP IF NOT
    1F77 C2 01 3818          1978         LA     SINCHR-1,XR1       POINT XR1 TO SINGLE CHAR FOR REST
    1F7B 34 01 2EF1          1979         ST     STDAT,XR1          CHANGE POINTER
    1F7F 9C 00 00 00         1980 MOVE    MVC    0(1,XR2),0(,XR1)   MOVE DATA FROM TABLE TO EXP BUFF
    1F83 D2 01 01 01         1981         LA     1(,XR1),XR1        UPDATE POINTERS
    1F86 E2 02 01            1982         LA     1(,XR2),XR2
    1F89 C0 87 1F65          1983         B      AGAIN              LOOP
    1F8D 35 01 2EF1          1984 TDONE   L      STDAT,XR1          POINT XR1 TO START OF DATA AGAIN
    1F91 C0 87 1F7F          1985         B      MOVE
    1F95 34 01 2EEF          1986 BLKDN   ST     CURDAT,XR1         UPDATE CURRENT DATA ADDR
    1F99 C0 87 0000          1987 FILTR   B      *-*                RETURN
                             1988
                             1988
    1F9D 34 08 1FB8          1989 CHECK1  ST     CH1RT+3,ARR        STORE RETURN ADDR
    1FA1 0D FF 2E72 42FF     1990         CLC    EXPBUF+255(256),XMITRC+255  TEST EXP. = ACT.
    1FA7 C0 01 1FF0          1991         BNE    RDERR              ERROR IF NOT
    1FAB 0D 1F 2E92 431F     1992         CLC    EXPBUF+287(32),XMITRC+287
    1FB1 C0 01 1FF0          1993         BNE    RDERR
    1FB5 C0 87 0000          1994 CH1RT   B      *-*                RETURN TO USER
                             1995
    1FB9 34 08 1FD4          1996 CHECK2  ST     CH2RT+3,ARR        STORE RETURN ADDRESS
    1FBD 0D FF 2E72 42FF     1997         CLC    EXPBUF+255(256),XMITRC+255  TEST EXP. = ACT.
    1FC3 C0 01 1EEA          1998         BNE    CHECK              MAYBE THE END
    1FC7 0D 1F 2E92 431F     1999         CLC    EXPBUF+287(32),XMITRC+287
    1FCD C0 01 1EEA          2000         BNE    CHECK
    1FD1 C0 87 0000          2001 CH2RT   B      *-*                RETURN TO USER
                             2002
                             2002
    1FD5 34 08 1FE8          2003 FILLFF  ST     FILFFR+3,ARR       STORE RETURN
    1FD9 0C FF 2E92 2E93     2004         MVC    EXFIL-1(256),EXFIL FILL EXPECTED RESULT BUFFER
    1FDF 0C 1F 2D93 2D94     2005         MVC    EXPBUF+32(32),EXPBUF+33      WITH 'FF'
    1FE5 C0 87 0000          2006 FILFFR  B      *-*                RETURN TO USER
                             2007 ***************************************************
                             2008 *  SUBROUTINE TO PRINT CONTENTS OF TRANSMIT/RECEIVE ****************
                             2009 *  FIELD AND EXPECTED RESULTS BUFFER                *
                             2010 ***************************************************
                             2011
    1FE9 34 08 2083          2012 PXREXA  ST     PXRRT+3,ARR        STORE RETURN ADDRESS
    1FED F2 87 08            2013         J      PXREX              PRINT EXPECTED & RECEIVED FIELDS
    1FF0 3C 08 262A          2014 RDERR   MVI    ERR,DATER          SET DATA MISCOMPARE ERROR
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1FF4 C0 87 22A7           2015 MISCOM B     ERROR               GO TO ERROR ROUTINE
   1FF8 0C 49 2F39 2F3A      2016 PXREX  MVC   RECFL(74),PBUFBL     BLANK OUT BUFFER
   1FFE 0C 49 2F84 2F85      2017        MVC   PLINE(74),PLINBL     BLANK OUT PRINT LINE
   2004 0C 07 2F78 300D      2018        MVC   PLINE-12(8),RECD     SET UP HEADING
   200A 0C 07 2F53 3005      2019        MVC   PLINE-49(8),EXP
   2010 0C 0C 2F47 39E5      2020        MVC   PLINE-61(13),XMRCMG   MOVE IN HEADING INFO
   2016 C0 87 021A           2021        B     PRINT               GO PRINT HEADING
   201A 81                201A 2022      DC    XL1'81'
   201B 4A                201B 2023      DC    IL1'74'
   201C 2F84              201D 2024      DC    AL2(PLINE)
   201E 0C 49 2F84 2FCF      2025        MVC   PLINE(74),PHEAD     MOVE IN HEADER
   2024 C0 87 021A           2026        B     PRINT               PRINT IT
   2028 82                2028 2027      DC    XL1'82'             SPACE 2
   2029 4A                2029 2028      DC    IL1'74'
   202A 2F84              2028 2029      DC    AL2(PLINE)
   202C 0C 01 2FD1 261A      2030        MVC   HEADAD(2),LCAR      INITIALIZE ADDRESS
   2032 C2 01 2D82           2031        LA    EXPBUF+15,XR1       POINT TO DATA
   2036 C2 02 420F           2032        LA    XMITRC+15,XR2
                             2033
   203A 1C 0F 2F84 00        2034 GOAGN  MVC   PLINE(16),0(,XR1)    MOVE IN EXP DATA
   203F 2C 0F 2F70 00        2035        MVC   PLINE-20(16),0(,XR2)  MOVE IN REC. DATA
   2044 C0 87 021E           2036        B     UNPACK
   2048 10                2048 2037      DC    IL1'16'
   2049 2F84              204A 2038      DC    AL2(PLINE)
   204B 2F15              204C 2039      DC    AL2(EXPFL)
   204D C0 87 021E           2040        B     UNPACK
   2051 10                2051 2041      DC    IL1'16'
   2052 2F70              2053 2042      DC    AL2(PLINE-20)
   2054 2F39              2055 2043      DC    AL2(RECFL)
   2056 C0 87 021E           2044        B     UNPACK
   205A 02                205A 2045      DC    IL1'2'
   205B 2FD1              205C 2046      DC    AL2(HEADAD)
   205D 2EF3              205E 2047      DC    AL2(LINADR)
                             2048
   205F 0D 1F 2F39 2F15      2049        CLC   RECFL(32),EXPFL     IS THIS LINE SAME IN BOTH FIELDS
   2065 F2 01 0C             2050        JNE   GOSETP              JUMP IF NOT
   2068 0D 1F 2F39 2FF1      2051        CLC   RECFL(32),FFFF      IS THIS LINE ALL FF'S
   206E F2 81 1D             2052        JE    NOPRTN              IF SO, DON'T PRINT
   2071 F2 87 0C             2053        J     PRINLN              GO PRINT LINE
   2074 C0 87 20BB           2054 GOSETP B     PP                  GO PRINT '.' OVER DIFFERNECES
   2078 C0 87 021A           2055        B     PRINT
   207C 81                207C 2056      DC    XL1'81'
   207D 4A                207D 2057      DC    IL1'74'
   207E 2F84              207F 2058      DC    AL2(PLINE)
   2080 0C 49 2F84 2F39      2059 PRINLN MVC   PLINE(74),RECFL     MOVE LINE TO PRINT
   2086 C0 87 021A           2060        B     PRINT
   208A 81                208A 2061      DC    XL1'81'
   208B 4A                208B 2062      DC    IL1'74'
   208C 2F84              208D 2063      DC    AL2(PLINE)
   208E 0E 01 2FD1 2FF3      2064 NOPRTN ALC   HEADAD(2),SIXTEN     ADD SIXTEEN TO ADDRESS
   2094 0D 01 2FD1 2FF5      2065        CLC   HEADAD(2),ENDP      CHECK FOR END
   209A F2 81 0A             2066        JE    POUT                OUT IF SO
   209D D2 01 10             2067        LA    16(,XR1),XR1        UPDATE POINTERS
   20A0 E2 02 10             2068        LA    16(,XR2),XR2
   20A3 C0 87 203A           2069        B     GOAGN               LOOP
                          20A7 2070 POUT  EQU   *
   20A7 C0 87 021A           2071        B     PRINT               GO SPACE 6 AND HALT
   20AB 96                20AB 2072      DC    XL1'96'
   20AC 3D 00 262A           2073        CLI   ERR,0               WAS ERROR CODE SET UP?
   20B0 C0 81 0000           2074 PXRRT  BE    *-*                 RETURN TO USER IF NO ERROR CODE
   20B4 C0 87 24C8           2075        B     HLTERR              GO HALT
                             2076
                             2076
   20B8 34 08 2110           2077 PP     ST    PPR+3,ARR           STORE RETURN
   20BC 34 01 2108           2078        ST    PPXR1+3,XR1
   20C0 34 02 210C           2079        ST    PPXR2+3,XR2
   20C4 0C 49 2F84 2F85      2080        MVC   PLINE(74),PLINBL    BLANK OUT PRINT LINE
   20CA 0C 43 2F84 2F39      2081        MVC   PLINE(68),RECFL     PUT IN DATA
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   20D0 C2 01 2F65           2082        LA    PLINE-31,XR1        POINT TO DATA
   20D4 C2 02 2F41           2083        LA    PLINE-67,XR2
   20D8 6D 00 00 00          2084 CHKIT  CLC   0(1,XR1),0(,XR2)    CHECK DATA EQUAL
   20DC F2 01 09             2085        JNE   PUTP                IF NOT INSERT .
   20DF 7C 40 00             2086        MVI   0(,XR1),C' '        INSERT BLANK
   20E2 BC 40 00             2087        MVI   0(,XR2),C' '        INSERT BLANK
   20E5 F2 87 06             2088        J     UPIT
   20E8 7C 4B 00             2089 PUTP   MVI   0(,XR1),C'.'        INSERT PERIOD
   20EB BC 4B 00             2090        MVI   0(,XR2),C'.'        INSERT PERIOD
   20EE 34 01 2FF9           2091 UPIT   ST    WORK,XR1
   20F2 0D 01 2FF9 2FF7      2092        CLC   WORK(2),ELIN        TEST FOR END OF LINE
   20F8 F2 81 0A             2093        JE    PPXR1               EXIT IF SO
   20FB D2 01 01             2094        LA    1(,XR1),XR1         UPDATE POINTERS
   20FE E2 02 01             2095        LA    1(,XR2),XR2
   2101 C0 87 20D8           2096        B     CHKIT               LOOP
   2105 C2 01 0000           2097 PPXR1  LA    *-*,XR1             RESTORE XR1
   2109 C2 02 0000           2098 PPXR2  LA    *-*,XR2             RESTORE XR2
   210D C0 87 0000           2099 PPR    B     *-*                 RETURN
                             2100 ************************************************
                             2101 *  SUBROUTINE TO TEST ACK IN RESPONSE TO WRITE CMD **-*****************
                             2102 ************************************************
                             2103
   2111 3C 70 2FFB           2104 TRESPO MVI   ACK,X'70'           SET FOR ACK 0
   2115 F2 87 04             2105        J     TRESPX
   2118 3C 61 2FFB           2106 TRESP1 MVI   ACK,X'61'           INITIALIZE TO ACK 1
   211C 34 08 215D           2107 TRESPX ST    TRESPR+3,ARR        STORE RETURN ADDRESS
   2120 38 40 2FFD           2108        TBN   RTNFLG,X'40'        TEST DEVICE = PRINTER
   2124 F2 90 16             2109        JF    DISP                JUMP IF NOT
   2127 38 08 4203           2110        TBN   XMITRC+3,X'08'      WAS START PRINT ON IN WCC BYTE?
   212B F2 90 0F             2111        JF    DISP                IF NOT, IT LOOKS LIKE A DISPLAY
   212E 4D 01 01 2639        2112        CLC   1(2,XR1),WACK       DEVICE WAS PRINTER. TEST WACK
   2133 F2 01 0F             2113        JNE   TSTEOT              IF NOT, TEST FOR EOT
   2136 C0 87 215E           2114        B     WAITPB              WAIT FOR PRINTER BUSY TO FALL
   213A F2 87 1D             2115        J     TRESPR              RETURN
   213D 4D 01 01 2FFB        2116 DISP   CLC   1(2,XR1),ACK        TEST FOR CORRECT ACK
   2142 F2 81 15             2117        JE    TRESPR              EXIT IF CORRECT
                             2118
   2145 4D 01 01 2637        2119 TSTEOT CLC   1(2,XR1),EOT        WAS REPLY AN EOT?
   214A C0 01 1908           2120        BNE   OHOH                BRANCH IF NOT
   214E 3C 40 262A           2121        MVI   ERR,EOTC            SET ERROR
   2152 C0 87 22A7           2122        B     ERROR
   2156 C0 87 1CDB           2123        B     FETCHS              GO FETCH STATUS
                             2124
   215A C0 87 0000           2125 TRESPR B     *-*                 RETURN TO USER
                             2126 ************************************************
                             2127 *  SUBROUTINE TO WAIT FOR PRINTER BUSY TO DROP**********************
                             2128 ************************************************
                             2129
   215E 34 08 21B4           2130 WAITPB ST    WAITPR+3,ARR        STORE RETURN ADDR
   2162 0C 01 25FA 2605      2131        MVC   PSDEV(2),CURDEV     GET CURRENT DEVICE
   2168 0C 01 25F8 2651      2132        MVC   SPFLD(2),POLL       SET UP TO POLL
   216E 0F 01 2614 2614      2133        SLC   DVBCNT(2),DVBCNT    SET BUSY COUNT TO ZERO
                             2134
   2174 0E 01 2614 262D      2135 POLPR  ALC   DVBCNT(2),ONE       ADD TO BUSY COUNTER
   217A 38 60 2613           2136        TBN   DVBCNT-1,X'60'      ******ADJUST THIS VALUE
   217E F2 10 34             2137        JT    DVHB                JUMP IF HUNG BUSY
   2181 C0 87 1C39           2138        B     DOPOL               GO POLL
   2185 38 10 2658           2139        TBN   POLFLG,X'10'       WAS THE RESPONSE STATUS
   2189 F2 90 1D             2140        JF    WHAT                JUMP IF NOT
   218C 78 08 06             2141        TBN   6(,XR1),X'08'       TEST FOR BUSY ON
   218F C0 10 2174           2142        BT    POLPR               IF SO GO POLL AGAIN
   2193 4D 01 07 2643        2143        CLC   7(2,XR1),DE         NOT BUSY TEST FOR DEVICE END
   2198 F2 81 16             2144        JE    WAITPR              DONE IF SO
   2198 3C 15 262A           2145        MVI   ERR,BDST            SET BAD STATUS IND.
   219F 0C 01 2FF9 2643      2146        MVC   WORK(2),DE          MOVE DEVICE END STATUS TO WORK
   21A5 C0 87 22A7           2147        B     ERROR
   21A9 3C 0C 262A           2148 WHAT   MVI   ERR,UNK             SET UNKNOWN RESPONSE
   21AD C0 87 22A7           2149        B     ERROR
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    21B1 C0 87 0000           2150 WAITPR B     *-*
    21B5 3C 09 262A           2151 DVHB   MVI   ERR,DEVHB              SET DEVICE HUNG BUSY
    21B9 C0 87 22A7           2152        B     ERROR
                              2153 ****************************************
                              2154 *  SUBROUTINE TO SEND TEST PATTERNS  **********************************
                              2155 ****************************************
                              2156
    21BD C0 87 1C9A           2157 SENDTP B     SELECT                 GO SELECT THE DEVICE
    21C1 C0 87 1AB4           2158 SENTPB B     DOSIO                  GO WRITE THE TEST PATTERN
    21C5 000000000000    21CA 2159 TPARM  DC    XL6'0'                 PARAMETERS GET FILLED IN
    21CB C0 87 2118           2160        B     TRESP1                 GO TEST FOR CORRECT RESPONSE
                              2161
    21CF 0F 01 2614 2614      2162        SLC   DVBCNT(2),DVBCNT       RESET COUNTER
    21D5 0E 01 2614 262D      2163 WRTOK  ALC   DVBCNT(2),ONE          ADD ONE TO COUNTER
    21DB 38 20 020A           2164        TBN   SBYTE2,SSW12           IS SSW 12 ON?
    21DF F2 10 08             2165        JT    CONPOL                 NO TIME OUT IF SO
    21E2 3D 7F 2613           2166        CLI   DVBCNT-1,X'7F'         ADJUST FOR 90 SEC.
    21E6 C0 81 0216           2167        BE    LINK                   GO TO NEXT ROUTINE IF 90 SEC.
    21EA C0 87 1C39           2168 CONPOL B     DOPOL                  GO POLL THE DEVICE
    21EE 38 20 2658           2169        TBN   POLFLG,X'20'           WAS THE RESPONSE TEST REQ.
    21F2 F2 10 07             2170        JT    GOUNLK                 IF SO GO UNLOCK THE KEYBD
    21F5 38 40 2658           2171 TAID   TBN   POLFLG,X'40'           WAS AN AID KEY DEPRESSED
    21F9 F2 90 2C             2172        JF    TS                     IF NOT GO CHECK FOR STATUS
    21FC C0 87 1AB4           2173 GOUNLK B     DOSIO                  GO UNLOCK THE KEYBOARD
    2200 0004            2201 2174        DC    AL2(UNLOCE-UNLOCK)
    2202 431F            2203 2175        DC    AL2(XMITE)
    2204 30F5            2205 2176        DC    AL2(UNLOCE)
    2206 C0 87 2118           2177        B     TRESP1                 GO CHECK CORRECT RESPONSE
    220A C0 87 1AB4           2178        B     DOSIO                  GO SEND EOT TO DROP DEVICE
    220E 0000            220F 2179        DC    XL2'0'
    2210 4201            2211 2180        DC    AL2(XMITRC+1)
    2212 2636            2213 2181        DC    AL2(EOT-1)
    2214 38 20 2658           2182        TBN   POLFLG,X'20'           WAS IT A TEST REQ.
    2218 C0 10 0216           2183        BT    LINK                   GO TO NEXT ROUTINE IF SO
                              2184
    221C 3D 6E 2659           2185        CLI   AID,X'6E'              WAS AID A PA-2 (CNCL)
    2220 C0 81 0C84           2186        BE    TERM                   IF SO, TERMINATE PGM.
    2224 C0 87 21D5           2187        B     WRTOK                  IF NOT, GO POLL SOME MORE
                              2188
    2228 38 10 2658           2189 TS     TBN   POLFLG,X'10'           WAS THE RESPONSE STATUS?
    222C C0 90 21D5           2190        BF    WRTOK                  IF NOT POLL AGAIN
    2230 38 40 2FFD           2191        TBN   RTNFLG,X'40'           IS THE DEVICE A PRINTER
    2234 F2 10 08             2192        JT    CHKPS                  IF SO, GO CHECK STATUS
    2237 3C 04 262A           2193 OOPS3  MVI   ERR,UNX                SET UNEXPECTED RESPONSE
    223B C0 87 22A7           2194        B     ERROR                  GO TO ERROR
                              2195
    223F 0F 01 2614 2614      2196 CHKPS  SLC   DVBCNT(2),DVBCNT       RESET COUNTER
    2245 0D 01 265B 2635      2197        CLC   POLST(2),IR            WAS STATUS IR?
    224B F2 81 04             2198        JE    WAITDE                 IF SO GO WAIT FOR DEVICE END
    224E C0 87 2237           2199        B     OOPS3
                              2200
    2252 C0 87 1C39           2201 WAITDE B     DOPOL                  GO POLL AGAIN
    2256 0D 01 265B 2643      2202        CLC   POLST(2),DE            CHECK FOR DEVICE END
    225C C0 81 0216           2203        BE    LINK                   IF SO, GO TO NEXT ROUTINE
    2260 0E 01 2614 262D      2204        ALC   DVBCNT(2),ONE          ADD 1 TO COUNT
    2266 38 08 2613           2205        TBN   DVBCNT-1,X'08'         WAITS FOR ABOUT 6 SEC
    226A C0 90 2252           2206        BF    WAITDE                 GO POLL AGAIN
    226E C0 87 0C84           2207        B     TERM                   GO TERM PGM.
                              2208 **********************
                              2209 *  DELAY SUBROUTINE  ********************************************
                              2210 **********************
                              2211 *      B     DELAY
                              2212 *      DC    IL2'XX'                XX = NUMBER OF MILLISECONDS TO DELAY
                              2213
    2272 34 08 22A6           2214 DELAY  ST    DELAYR+3,ARR           STORE RETURN ADDRESS
    2276 34 01 22A2           2215        ST    RXR1+3,XR1             STORE XR1
    227A 35 01 22A6           2216        L     DELAYR+3,XR1           GET ADDRES OF DELAY ARAMETER
    227E 1C 01 3AD9 01        2217        MVC   COUNT,1(2,XR1)         FETCH COUNT
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    2283 0E 01 22A6 3ADB      2218        ALC   DELAYR+3(2),TWO        UPDATE THE RETURN ADDRESS
    2289 0D FF 4200 4200      2219 CNTLP  CLC   XMITRC(256),XMITRC
    228F 0D 3D 4200 4200      2220        CLC   XMITRC(62),XMITRC
    2295 0F 01 3AD9 262D      2221        SLC   COUNT(2),ONE           DECREMENT COUNT
    229B C0 01 2289           2222        BNZ   CNTLP                  LOOP TIL COUNT = 0
    229F C2 01 0000           2223 RXR1   LA    *-*,XR1                RESTORE XR1
    22A3 C0 87 0000           2224 DELAYR B     *-*
                              2225 ****************************************
                              2226 *  ERROR FORMATTING & PRINTOUT ROUTINE **********************************
                              2227 ****************************************
                              2228
    22A7 34 08 24E9           2229 ERROR  ST    ERRORR+3,ARR           STORE RETURN
    22AB 0C 00 24CD 262A      2230        MVC   ERRHLT(1),ERR          FILL IN HALT CODE
    22B1 3D 01 262A           2231        CLI   ERR,UNITCH             TEST FOR UNIT CHECK
    22B5 F2 01 06             2232        JNE   TERR2
    22B8 0C 11 2590 28A7      2233        MVC   LOGMSG(18),UNITNR      INSERT UNIT CHECK MESSAGE
    22BE 3D 02 262A           2234 TERR2  CLI   ERR,BUSE               TEST FOR HUNG BUSY
    22C2 F2 01 06             2235        JNE   TERR3
    22C5 0C 10 2590 2903      2236        MVC   LOGMSG(17),HBUSY       INSERT HUNG BUSY MESSAGE
    22CB 3D 03 262A           2237 TERR3  CLI   ERR,INPN               TEST FOR INT PND ERROR
    22CF F2 01 06             2238        JNE   TERR4
    22D2 0C CD 2590 28F2      2239        MVC   LOGMSG(14),INTPND      INSERT INT PND ERROR MSG
    22D8 3D 04 262A           2240 TERR4  CLI   ERR,UNX                TEST FOR UNEXPECTED STATUS
    22DC F2 01 06             2241        JNE   TERR5                  JUMP IF NOT
    22DF 0C 12 2590 2925      2242        MVC   LOGMSG(19),UNEXP       MOVE IN MESSAGE
    22E5 3D 05 262A           2243 TERR5  CLI   ERR,ATTCH              TEST FOR ATTACHMENT CHECK
    22E9 F2 01 06             2244        JNE   TERR6
    22EC 0C 0F 2590 28E4      2245        MVC   LOGMSG(16),ATTMSG      INSERT ATT CHECK MESSAGE
    22F2 3D 06 262A           2246 TERR6  CLI   ERR,ITBE               TEST FOR ITB ERROR
    22F6 F2 01 06             2247        JNE   TERR7
    22F9 0C 0C 2590 28D4      2248        MVC   LOGMSG(13),ITBMSG      INSERT ITB ERROR MESSAGE
    22FF 3D 07 262A           2249 TERR7  CLI   ERR,NOINT              TEST FOR NO INTERRUPT
    2303 F2 01 06             2250        JNE   TERR8
    2306 0C 08 2590 28C7      2251        MVC   LOGMSG(12),NOINTR      INSERT NO INTERRUPT MESSAGE
    230C 3D 08 262A           2252 TERR8  CLI   ERR,DATER              TEST FOR DATA MISCOMPARE
    2310 F2 01 06             2253        JNE   TERR9
    2313 0C 0E 2590 2912      2254        MVC   LOGMSG(15),MISDAT      INSERT MISCOMPARE MESSAGE
    2319 3D 09 262A           2255 TERR9  CLI   ERR,DEVHB              TEST FOR DEVICE HUNG BUSY
    231D F2 01 06             2256        JNE   TERROA                 JUMP IF NOT
    2320 0C 0D 2590 294A      2257        MVC   LOGMSG(14),DVBMSG      MOVE IN DEVICE BUSY MESSAGE
    2326 3D 0A 262A           2258 TERROA CLI   ERR,ATNR               TEST FOR ATTACH. NOT READY
    232A F2 01 06             2259        JNE   TERROF                 JUMP IF NOT
    232D 0C 10 2590 2895      2260        MVC   LOGMSG(17),ATTNOR      MOVE IN MESSAGE
    2333 3D 0F 262A           2261 TERROF CLI   ERR,MNL                TEST MICRO CODE NOT LOADED
    2337 F2 01 06             2262        JNE   TERR10
    233A 0C 14 2590 29C4      2263        MVC   LOGMSG(21),MICNLM      MOVE IN MESSAGE
    2340 3D 10 262A           2264 TERR10 CLI   ERR,INCOR              WAS IT INCORRECT RESPONSE
    2344 F2 01 06             2265        JNE   TERR20
    2347 0C 11 2590 297B      2266        MVC   LOGMSG(18),INCORM      MOVE IN MESSAGE
    234D 3D 20 262A           2267 TERR20 CLI   ERR,RVIS               TEST FOR RVI TO SELECT
    2351 F2 01 06             2268        JNE   TERR13                 JUMP IF NOT
    2354 0C 0C 2590 2932      2269        MVC   LOGMSG(13),RVIMSG      MOVE IN MESSAGE
    235A 3D 13 262A           2270 TERR13 CLI   ERR,ACCIN              WAS INVALID ADDRESS ACCEPTED
    235E F2 01 06             2271        JNE   TERR14
    2361 0C 12 2590 298E      2272        MVC   LOGMSG(19),ACCINM
    2367 3D 14 262A           2273 TERR14 CLI   ERR,NOEOT              CHECK FOR ERROR NO EOT
    236B F2 01 06             2274        JNE   TERR15
    236E 0C 0F 2590 299E      2275        MVC   LOGMSG(16),RSBEOT      MOVE IN MESSAGE
    2374 3D 15 262A           2276 TERR15 CLI   ERR,BDST               TEST FOR WRONG STATUS
    2378 F2 01 06             2277        JNE   TERR16
    237B 0C 10 2590 29AF      2278        MVC   LOGMSG(17),WRSTMG      MOVE IN MESSAGE
    2381 3D 16 262A           2279 TERR16 CLI   ERR,MPINT              CHECK MICRO POLL INT ERR
    2385 F2 01 06             2280        JNE   TERR17
    2388 0C 23 2590 29E8      2281        MVC   LOGMSG(36),MPMG1
    238E 3D 17 262A           2282 TERR17 CLI   ERR,MPCS               TEST CAR NOT EQUAL TO SAR
    2392 F2 01 06             2283        JNE   TERR18
    2395 0C 13 2590 2A5A      2284        MVC   LOGMSG(20),MPMG4       MOVE IN LOG MESSAGE
    239B 3D 18 262A           2285 TERR18 CLI   ERR,RNST               TEST STATUS NOT REC'D
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   239F F2 01 06                2286         JNE   TERR40
   23A2 0C 16 2590 2A71         2287         MVC   LOGMSG(23),MPMG5      MOVE IN LOG MESSAGE
   23A8 3D 40 262A              2288 TERR40  CLI   ERR,EOTC             TEST FOR EOT TO CMD
   23AC F2 01 06                2289         JNE   TERR0B               JUMP IF NOT
   23AF 0C 09 2590 293C         2290         MVC   LOGMSG(10),EOTMSG    MOVE IN MESSAGE
   23B5 3D 0B 262A              2291 TERR0B  CLI   ERR,WACKE            TEST UNEXPECTED WACK
   23B9 F2 01 06                2292         JNE   TERR0C
   23BC 0C 0E 2590 2959         2293         MVC   LOGMSG(15),UNWACK    MOVE IN MESSAGE
   23C2 3D 0C 262A              2294 TERR0C  CLI   ERR,UNK              TEST FOR UNKNOWN RESPONSE
   23C6 F2 01 06                2295         JNE   GETSET
   23C9 0C 0F 2590 2969         2296         MVC   LOGMSG(16),UNKOW     MOVE IN MESSAGE
                                2297
   23CF C0 87 021E              2298 GETSET  B     UNPACK               GO UNPACK CAR
   23D3 02              23D3    2299         DC    IL1'2'
   23D4 2620            23D5    2300         DC    AL2(SCAR)
   23D6 25A8            23D7    2301         DC    AL2(LOGCAR)
                                2302
   23D8 C0 87 021E              2303         B     UNPACK               GO UNPACK TAR
   23DC 02              23DC    2304         DC    IL1'2'
   23DD 2622            23DE    2305         DC    AL2(STAR)
   23DF 25B2            23E0    2306         DC    AL2(LOGTAR)
                                2307
   23E1 C0 87 021E              2308         B     UNPACK               GO UNPACK SAR
   23E5 02              23E5    2309         DC    IL1'2'
   23E6 2624            23E7    2310         DC    AL2(SSAR)
   23E8 25BC            23E9    2311         DC    AL2(LOGSAR)
                                2312
   23EA C0 87 021E              2313         B     UNPACK               GO UNPACK STATUS
   23EE 02              23EE    2314         DC    IL1'2'
   23EF 2626            23F0    2315         DC    AL2(SSTAT)
   23F1 259E            23F2    2316         DC    AL2(LOGST)
                                2317
   23F3 0C 00 2402 262A         2318         MVC   HEAD(1),ERR          MOVE ERROR TO HEADER
   23F9 C0 87 021A              2319         B     PRINT                GO PRINT 1ST MESSAGE
   23FD C2              23FD    2320         DC    XL1'C2'
   23FE 30              23FE    2321         DC    IL1'48'
   23FF 2591            2400    2322         DC    AL2(MSGBLK)
   2401 8900            2402    2323 HEAD    DC    XL2'8900'
   2403 C0 87 021A              2324         B     PRINT                GO PRINT CAR, TAR, SAR & STATUS
   2407 82              2407    2325         DC    XL1'82'
   2408 2B              2408    2326         DC    IL1'43'
   2409 258C            240A    2327         DC    AL2(LOGSAR)
   240B 3D 08 262A              2328         CLI   ERR,DATER            TEST FOR DATA ERROR
   240F C0 01 2427              2329         BNE   TEINC                BRANCH IF NOT
   2413 38 04 2E94              2330         TBN   RBFLG,X'04'          TEST DOING ERASE ALL UNPROT.
   2417 C0 90 1FF8              2331         BF    PXREX
   241B C0 87 021A              2332         B     PRINT                GO PRINT MESSAGE
   241F 02              241F    2333         DC    XL1'02'
   2420 1B              2420    2334         DC    IL1'27'
   2421 2A8C            2422    2335         DC    AL2(EAUMG)
   2423 C0 87 1FF8              2336         B     PXREX
   2427 3D 10 262A              2337 TEINC   CLI   ERR,INCOR             TEST FOR INCORRECT RESPONSE
   242B C0 81 1FF8              2338         BE    PXREX                IF SO, GO PRINT
   242F 3D 15 262A              2339         CLI   ERR,3DST             WAS ERROR - WRONG STATUS
   2433 F2 01 04                2340         JNE   PXRM                 JUMP IF NOT
   2436 C0 87 1D14              2341         B     PEXPST               GO PRINT EXPECTED STATUS
                                2342 *  PRINT CONTENTS OF TRANSMIT/RECEIVE FIELD
   243A C0 87 021A              2343 PXRM    B     PRINT                PRINT XMIT/REC HEADING
   243E 81              243E    2344         DC    XL1'81'
   243F 0D              243F    2345         DC    IL1'13'
   2440 39E5            2441    2346         DC    AL2(XMRCMG)
   2442 0C 1F 2F80 2FCF         2347         MVC   PLINE-4(32),PHEAD    SET UP HEADING
   2448 0C 25 2F60 2FAB         2348         MVC   PLINE-36(38),PHEADA
   244E C0 87 021A              2349         B     PRINT                GO PRINT HEADING
   2452 82              2452    2350         DC    XL1'82'
   2453 46              2453    2351         DC    IL1'70'
   2454 2F80            2455    2352         DC    AL2(PLINE-4)
   2456 0C 01 2FD1 261A         2353         MVC   HEADAD(2),LCAR       INITIALIZE HEADING ADDR
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   245C 0C 01 2471 37C3         2354         MVC   UNPKA(2),STXRP       INITIALIZE UNPACK ADDRESS
   2462 C0 87 021E              2355 PXRNL   B     UNPACK               UNPACK ADDRESS
   2466 02              2466    2356         DC    XL1'02'
   2467 2FD1            2468    2357         DC    AL2(HEADAD)
   2469 2F3E            246A    2358         DC    AL2(PLINE-70)
   246B C0 87 021E              2359         B     UNPACK               UNPACK DATA
   246F 20              246F    2360         DC    IL1'32'
   2470 0000            2471    2361 UNPKA   DC    AL2(*-*)             SOURCE ADDR GETS FILLED IN
   2472 2F80            2473    2362         DC    AL2(PLINE-4)
   2474 0D 1F 2F80 2FF1         2363         CLC   PLINE-4(32),FFFF     TEST LINE ALL F'S
   247A F2 01 09                2364         JNE   PXRC                 PRINT IF NOT
   247D 0D 1F 2F60 2FF1         2365         CLC   PLINE-36(32),FFFF
   2483 F2 81 08                2366         JE    NOP                  NO PRINT IF ALL F'S
   2486 C0 87 021A              2367 PXRC    B     PRINT                PRINT LINE OF DATA
   248A 81              248A    2368         DC    XL1'81'
   248B 46              248B    2369         DC    IL1'70'
   248C 2F80            248D    2370         DC    AL2(PLINE-4)
   248E 0E 01 2471 37C1         2371 NOP     ALC   UNPKA(2),THREE2      ADD 32 TO ADDRESS
   2494 0E 01 2FD1 37C1         2372         ALC   HEADAD(2),THREE2     ADD 32 TO ADDRESS
   249A 0D 01 2471 37C5         2373         CLC   UNPKA(2),SPXRP       CHECK FOR END
   24A0 C0 04 2462              2374         BNH   PXRNL                GO DO NEXT LINE IF NOT END
                                2375
   24A4 C0 87 021A              2376         B     PRINT                GO SPACE 6
   24A8 96              24A8    2377         DC    XL1'96'
                                2378
   24A9 4D 02 02 264C           2379         CLC   2(3,XR1),STATR       WAS RESULT STATUS?
   24AE F2 01 09                2380         JNE   TSTHLT               JUMP IF NOT
   24B1 C0 87 1D27              2381         B     FORMAT               GO PRINT STATUS DECODE
   24B5 C0 87 021A              2382         B     PRINT                GO SPACE 6
   24B9 96              24B9    2383         DC    XL1'96'
                                2384
   24BA 3D 20 262A              2385 TSTHLT  CLI   ERR,RVIS             WAS IT RVI TO SELECT
   24BE F2 81 11                2386         JE    PHMSG                GO PRINT MESSAGE IF SO
   24C1 3D 40 262A              2387         CLI   ERR,EOTC             WAS IT EOT TO COMMAND
   24C5 F2 81 0A                2388         JE    PHMSG                GO PRINT MESSAGE IF SO
                                2389
   24C8 C0 87 0222              2390 HLTERR  B     HALT                 GO HALT
   24CC 8900            24CD    2391 ERRHLT  DC    XL2'8900'            *****HALT CODE GETS FILLED IN******
   24CE C0 87 0216              2392         B     LINK                 GO TO NEXT ROUTINE
                                2393
   24D2 C0 87 021A              2394 PHMSG   B     PRINT                PRINT MESSAGE TO RESET HALT
   24D6 86              24D6    2395         DC    XL1'86'
   24D7 21              24D7    2396         DC    IL1'33'
   24D8 2D61            24D9    2397         DC    AL2(RSTHMG)
   24DA 0C 00 24E5 24CD         2398         MVC   STHLT(1),ERRHLT      MOVE IN HALT CODE
   24E0 C0 87 0222              2399         B     HALT
   24E4 8900            24E5    2400 STHLT   DC    XL2'8900'            HALT CODE GETS FILLED IN
                                2401
   24E6 C0 87 0000              2402 ERRORR  B     *-*                  RETURN TO USER
                                2403
                                2404 ********************************************************
                                2405 *      SUBROUTINE TO CHECK FOR MODEL 4 AND DEVICE 40 ******************
                                2406 ********************************************************
                                2407
                                2408 *      THIS ROUTINE CHECKS FOR THE CONSOLE DEVICE (40) ON A MODEL 4
                                2409 *      IF SO, TEST PATTERNS AND KEYBOARD ROUTINES ARE SKIPPED.
                                2410 *      HOWEVER, IF SSW 28 IS TURNED ON, THIS TEST IS IGNORED.
                                2411
   24EA 34 08 2507              2412 CHMODX  ST    MODXR+3,ARR          STORE RETURN ADDRESS
   24EE 38 80 020D              2413         TBN   SBYTE5,SSW28         TEST SSW 28 ON
   24F2 F2 10 0F                2414         JT    MODXR                SKIP THIS TEST IF SO
   24F5 3D 40 2605              2415         CLI   CURDEV,X'40'         CHECK FOR DEVICE 40
   24F9 F2 01 08                2416         JNE   MODXR                OUT IF NOT
   24FC 3D C2 0200              2417         CLI   X'200',C'B'          TEST FOR MODEL 4
   2500 C0 81 0216              2418         BE    LINK                 SKIP ROUTINE IF SO
   2504 C0 87 0000              2419 MODXR   B     *-*                  RETURN
                                2420
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2421 ************************
                         2422 *  INTERRRUPT ROUTINE  ***************************************************
                         2423 ************************
                         2424
 2508 34 01 253A         2425 INT2   ST    X1+3,XR1          SAVE XR1
 250C 34 02 253E         2426        ST    X2+3,XR2          SAVE XR2
 2510 34 04 2618         2427        ST    PSRW,PSR          SAVE PSR
 2514 35 04 262C         2428        L     ZERO,PSR          INITIALIZE PSR TO ZERO
 2518 C1 5D 255A         2429 TSTATT TIO   ERRATC,ATTCHK     TEST FOR ATTACHMENT CHECK
 251C C1 89 2520         2430        TIO   GOON,X'89'        TEST FOR DA OP END INTERRUPT
                         2431
 2520 C1 88 254A         2432 GOON   TIO   UNITC,NORDUC      TEST FOR UNIT CHECK
 2524 C1 8C 252F         2433        TIO   IO1,X'8C'         TEST FOR INTERRUPT PENDING
 2528 3C 03 262A         2434        MVI   ERR,INPN          ERROR, INTERRUPT SHOULD BE PND.
 252C F2 87 04           2435        J     IEXIT             EXIT
 252F C1 8B 2552         2436 IO1    TIO   ITBER,X'8B'       TEST FOR ITB INTERRUPT
                         2437
 2533 3C 00 2610         2438 IEXIT  MVI   INTFLG,0          SET INTERRUPT OCCURRED INDICATION
 2537 C2 01 0000         2439 X1     LA    *-*,XR1           RESTORE XR1
 253B C2 02 0000         2440 X2     LA    *-*,XR2           RESTORE XR2
 253F 35 04 2618         2441        L     PSRW,PSR          RESTORE PSR
                         2442
 2543 F3 88 01           2443        SIO   X'01',CNTRL       RESET THE INTERRUPT
 2546 C0 87 2508         2444        B     INT2              TAKE NEXT INTERRUPT
                         2445
                         2446 *      ERRORS
 254A 3C 01 262A         2447 UNITC  MVI   ERR,UNITCH        SET UNIT CHECK
 254E C0 87 2533         2448        B     IEXIT             EXIT
 2552 3C 06 262A         2449 ITBER  MVI   ERR,ITBE          SET ITB ERROR
 2556 C0 87 2533         2450        B     IEXIT
 255A 3C 05 262A         2451 ERRATC MVI   ERR,ATTCH         SET ATTACHMENT CHECK
 255E C0 87 2533         2452        B     IEXIT
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2454 ********************
                         2455 *  ERROR LOGOUT    ***************************************************
                         2456 ********************
                    2562 2457 LOG    EQU   *
 2562 C4C5E5C9C3C540E7 256A 2458 LOGDEV DC    CL9'DEVICE XX'
 256A E7                 2458
 256B 4040404040404040 2590 2459 LOGMSG DC    38CL1' '
 2573 4040404040404040      2459
 257B 4040404040404040      2459
 2583 4040404040404040      2459
 258B 40404040404040        2459
 2591 40               2591 2460 MSGBLK DC    CL1' '
 2592 4040E2E3C1E3E4E2 259E 2461 LOGST  DC    CL13'  STATUS=XXXX'
 259A 7EE7E7E7E7       2461
 259F 4040C3C1D97EE7E7 25A8 2462 LOGCAR DC    CL10'  CAR=XXXX'
 25A7 E7E7             2462
 25A9 4040E3C1D97EE7E7 25B2 2463 LOGTAR DC    CL10'  TAR=XXXX'
 25B1 E7E7             2463
 25B3 4040E2C1D97EE7E7 25BC 2464 LOGSAR DC    CL10'  SAR=XXXX'
 25BB E7E7             2464
                         2465
                         2466 *******************************
                         2467 *  DATA FIELDS AND CONSTANTS  ***************************************
                         2468 *******************************
                         2469
                    25BD 2470 WRT    EQU   *
 25BD 0227F5             25BF 2471 WRTFLD DC    XL3'0227F5'       STX,ESC,ER/WR (GETS CHANGED TO WR)
 25C0 5F                 25C0 2472 WCC    DC    XL1'5F'           WCC - DO EVERYTHING 40 CHAR PRINT
 25C1 110000             25C3 2473 WRTADR DC    XL3'110000'       SBA, ADDR GETS FILLED IN
 25C4 1DE913             25C6 2474        DC    XL3'1DE913'       SF, PROT, HI INT., MOD., IC
 25C7 C4C5E5C9C3C540E7 25CF 2475 DEVICE DC    CL9'DEVICE XX'    DEVICE GETS FILLED IN
 25CF E7                 2475
 25D0 1DC1               25D1 2476        DC    XL2'1DC1'         SF, UNPROT., MOD.
 25D2 005C005C005C005C 25E9 2477        DC    6XL4'005C005C'
 25DA 005C005C005C005C      2477
 25E2 005C005C005C005C      2477
 25EA D9E3D5F0F2       25EE 2478        DC    CL5'RTN02'
 25EF 114040           25F1 2479        DC    XL3'114040'       SBA TO RESET BUFFER ADDR TO ZERO
 25F2 03               25F2 2480 EWRT   DC    XL1'03'           ETX
                         2481
                    25F3 2482 SELPOL EQU   *                   SELECT/POLL MESSAGE
 25F3 37FF32320000       25F8 2483 SPFLD  DC    XL6'37FF32320000' POLL OR SLECT GETS FILLED IN
 25F9 0000               25FA 2484 PSDEV  DC    XL2'0000'         DEVICE GETS FILLED IN
 25FB 2D                 25FB 2485 ENQ    DC    XL1'2D'           ENQ - ENDS POLL OR SELECT
                         2486
                    25FC 2487 RDMOD  EQU   *                   READ MODIFIED COMMAND
 25FC 0227F603           25FF 2488 RDMODE DC    XL4'0227F603'     STX,ESC,RD MOD,ETX
                         2489
                    2600 2490 RDB    EQU   *
 2600 0227F203           2603 2491 RDBE   DC    XL4'0227F203'     READ BUFFER COMMAND
                         2492
 2604 0000               2605 2493 CURDEV DC    XL2'0'            CURRENT DEVICE
 2606 0000               2607 2494 LINE   DC    XL2'0'            CURRENT LINE POINTER (LOW BYTE)
 2608 2609               2609 2495 INXR2  DC    AL2(ONFLG-4)      START OF 'ON' FLAGS
                         2496
                         2497 *      KEEP THE FOLLOWING 2 BYTE FLAG BYTES TOGETHER AND IN ORDER
                         2498 *      BITS 2-7 OF HI BYTE USED FOR DEVICES C2-C7
                         2499 *      BITS 2-7 OF LO BYTE USED FOR DEVICES D2-D7
                         2500
 260A 00000000           260D 2501 ONFLG  DC    XL4'0'            DEVICE AVAILABLE FLAGS ----------1
                         2502
 260E 00                 260E 2503 RESTFL DC    XL1'0'            RESTART FLAG = FF IF PGM IS LOOPING
 260F 00                 260F 2504 DONE   DC    XL1'0'            = FF WHEN ALL DEVICES ARE DONE
 2610 00                 2610 2505 INTFLG DC    XL1'0'            INTERRUPT FLAG
 2611 0000               2612 2506 BCNT   DC    XL2'0'            BUSY COUNTER
 2613 0000               2614 2507 DVBCNT DC    XL2'0'            DEVICE BUSY COUNTER
 2615 2508               2616 2508 AINT2  DC    AL2(INT2)         ADDRESS OF INTERRUPT ROUTINE
 2617 0000               2618 2509 PSRW   DC    XL2'0'            PSR STORAGE AREA
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    2619 4200           261A 2510 LCAR   DC    AL2(XMITRC)      TRANSMIT/RECEIVE FIELD ADDRESS
    261B 0000           261C 2511 LTAR   DC    XL2'0'           LIO TAR FIELD
    261D 0000           261E 2512 LSAR   DC    XL2'0'           LIO SAR FIELD
    261F 0000           2620 2513 SCAR   DC    XL2'0'           SNS CAR FIELD
    2621 0000           2622 2514 STAR   DC    XL2'0'           SNS TAR FIELD
    2623 0000           2624 2515 SSAR   DC    XL2'0'           SNS SAR FIELD
    2625 0000           2626 2516 SSTAT  DC    XL2'0'           SNS STATUS FIELD
    2627 00             2627 2517 PFLG   DC    XL1'0'           PRINT FLAG = FF IF PRINTING
    2628 00             2628 2518 WRTCMD DC    XL1'0'           CURRENT WRITE OR ERASE/WRITE CMD.
    2629 00             2629 2519 PASS1  DC    XL1'0'           = FF IF NOT FIRST PASS
    262A 00             262A 2520 ERR    DC    XL1'0'           INTERIM ERROR HALT BYTE
    262B 000001         262D 2521 ONE    DC    XL3'000001'      HEX 1 AND ZERO
                        262C 2522 ZERO   EQU   ONE-1            ZERO FIELD 2 BYTE LONG
    262E 0003           262F 2523 THREE  DC    XL2'0003'        CONSTANT THREE
    2630 0006           2631 2524 SIX    DC    XL2'0006'        HEX 6
    2632 0101           2633 2525 DEVINC DC    XL2'0101'        CONSTANT TO INCREMENT DEVICES
    2634 4050           2635 2526 IR     DC    XL2'4050'        INT. REQ. STATUS
    2636 37FF           2637 2527 EOT    DC    XL2'37FF'        EOT RESPONSE
    2638 106B           2639 2528 WACK   DC    XL2'106B'        WACK RESPONSE
    263A 107C           263B 2529 RVI    DC    XL2'107C'        RVI RESPONSE
    263C 1070           263D 2530 ACK0   DC    XL2'1070'        ACK 0 RESPONSE
    263E 1061           263F 2531 ACK1   DC    XL2'1061'        ACK 1 RESPONSE
    2640 C250           2641 2532 IRDE   DC    XL2'C250'        INT. RQ., DEVICE END STATUS
    2642 C240           2643 2533 DE     DC    XL2'C240'        DEVICE END STATUS
    2644 40C2           2645 2534 CC     DC    XL2'40C2'        CONTROL CHECK STATUS
    2646 C840           2647 2535 DB     DC    XL2'C840'        DEVICE BUSY STATUS
    2648 C4C4           2649 2536 DCUS   DC    XL2'C4C4'        DATA CHECK, UNIT SPECIFY STATUS
    264A 016CD9         264C 2537 STATR  DC    XL3'016CD9'      START OF STATUS MESSAGE
    264D 016C61         264F 2538 TSTREQ DC    XL3'016C61'      START OF TEST REQ MESSAGE
    2650 4040           2651 2539 POLL   DC    XL2'4040'        POLL CONSTANT, DEVICE 40
    2652 6060           2653 2540 SEL    DC    XL2'6060'        SELECT CONSTANT
    2654 E7E7E7E7       2657 2541 XXXX   DC    CL4'XXXX'        ERROR BLANKING CONSTANT
    2658 00             2658 2542 POLFLG DC    XL1'0'           POLL FLAGS ----------1
    2659 00             2659 2543 AID    DC    XL1'0'           AID CHARACTER ----------2
    265A 0000           265B 2544 POLST  DC    XL2'0'           POLL STATUS ----------3
    265C 0000           265D 2545 CURACK DC    XL2'00'          CURRENT ACK BEING SENT
    265E 3F3F           265F 2546 STDEV  DC    XL2'3F3F'        CONSTANT FOR START DEVICE
    2660 00             2660 2547 CONFLG DC    XL1'0'           FLAG TO DETERMINE RTN 02 RUN
    2661 00             2661 2548 SAVAID DC    XL1'0'           AID GETS SAVED HERE SOMETIMES
    2662 7200           2663 2549 X7200  DC    XL2'7200'        CONTENTS OF 1ST WORD IN MICRO CODE
    2664 E6C1D9D5C9D5C740 268E 2550 WARN   DC    CL43'WARNING - RTN 01-02 NOT RUN FOR THIS DEVICE'
    266C 6040D9E3D540F0F1       2550
    2674 60F0F240D5D6E340       2550
    267C D9E4D540C6D6D940       2550
    2684 E3C8C9E240C4C5E5       2550
    268C C9C3C5                 2550
                                2551
    268F D9E3D540F0F14060 26B0 2552 HEAD1A DC    CL34'RTN 01 - CHECK DEVICE AVAILABILITY'
    2697 40C3C8C5C3D240C4       2552
    269F C5E5C9C3C540C1E5       2552
    26A7 C1C9D3C1C2C9D3C9       2552
    26AF E3E8                   2552
    26B1 D9E3D540F0F14060 26C6 2553 HEAD1B DC    CL22'RTN 01 - DEVICE UPDATE'
    26B9 40C4C5E5C9C3C540       2553
    26C1 E4D7C4C1E3C5           2553
    26C7 D9E3D540F0F24060 26EF 2554 HEAD2  DC    CL41'RTN 02 - MODEL, DEVICE TYPE DETERMINATION'
    26CF 40D4D6C4C5D36B40       2554
    26D7 C4C5E5C9C3C540E3       2554
    26DF E8D7C540C4C5E3C5       2554
    26E7 D9D4C9D5C1E3C9D6       2554
    26EF D5                     2554
    26F0 D9E3D540F0F34060 2708 2555 HEAD3  DC    CL25'RTN 03 - RIPPLE DATA TEST'
    26F8 40D9C9D7D7D3C540       2555
    2700 C4C1E3C140E3C5E2       2555
    2708 E3                     2555
    2709 D9E3D540F0F44060 2726 2556 HEAD4  DC    CL30'RTN 04 - SINGLE CHARACTER TEST'
    2711 40E2C9D5C7D3C540       2556
    2719 C3C8C1D9C1C3E3C5       2556
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    2721 D940E3C5E2E3           2556
    2727 D9E3D540F0F54060 2741 2557 HEAD5  DC    CL27'RTN 05 - READ MODIFIED TEST'
    272F 40D9C5C1C440D4D6       2557
    2737 C4C9C6C9C5C440E3       2557
    273F C5E2E3                 2557
    2742 D9E3D540F0F64060 2766 2558 HEAD6  DC    CL37'RTN 06 - WRITE FUNCTION TESTS AND EAU'
    274A 40E6D9C9E3C540C6       2558
    2752 E4D5C3E3C9D6D540       2558
    275A E3C5E2E3E240C1D5       2558
    2762 C440C5C1E4             2558
    2767 D9E3D540F0F74060 2786 2559 HEAD7  DC    CL32'RTN 07 - INVALID ADDR. DETECTION'
    276F 40C9D5E5C1D3C9C4       2559
    2777 40C1C4C4D94B40C4       2559
    277F C5E3C5C3E3C9D6D5       2559
    2787 D9E3D540F0F8406C 27A5 2560 HEAD8  DC    CL31'RTN 08 - INVALID DATA DETECTION'
    278F 40C9D5E5C1D3C9C4       2560
    2797 40C4C1E3C140C4C5       2560
    279F E3C5C3E3C9D6D5         2560
    27A6 D9E3D540F0F94060 27D6 2561        DC    CL49'RTN 09 - UPPER/LOWER CASE ALPHA TEST & CONTINUOUS'
    27AE 40E4D7D7C5D961D3       2561
    27B6 D6E6C5D940C3C1E2       2561
    27BE C540C1D3D7C8C140       2561
    27C6 E3C5E2E3405040C3       2561
    27CE D6D5E3C9D5E4D6E4       2561
    27D6 E2                     2561
    27D7 40D7D6D3D3     27DB 2562 HEAD9  DC    CL5' POLL'
    27DC D9E3D540F0C14060 27FD 2563 HEADA  DC    CL34'RTN 0A - TEST PATTERN INSTRUCTIONS'
    27E4 40E3C5E2E340D7C1       2563
    27EC E3E3C5D9D540C9D5       2563
    27F4 E2E3D9E4C3E3C9D6       2563
    27FC D5E2                   2563
    27FE D9E3D540F0E7   2803 2564 HDTP1  DC    CL6'RTN 0X'
    2804 406040E3C5E2E340 2814 2565 HEADP  DC    CL17' - TEST PATTERN X'
    280C D7C1E3E3C5D9D540       2565
    2814 E7                     2565
    2815 D9E3D540F1F04060 2833 2566 HEAD10 DC    CL31'RTN 10 - KEYBOARD FUNCTION TEST'
    281D 40D2C5E8C2D6C1D9       2566
    2825 C440C6E4D5C3E3C9       2566
    282D D6D540E3C5E2E3         2566
    2834 D9E3D540F1F14060 2860 2567 HEAD11 DC    CL45'RTN 11 - UPPER/LOWER CASE ALPHA KEYBOARD TEST'
    283C 40E4D7D7C5D961D3       2567
    2844 D6E6C5D940C3C1E2       2567
    284C C540C1D3D7C8C140       2567
    2854 D2C5E8C2D6C1D9C4       2567
    285C 40E3C5E2E3             2567
    2861 D9E3D540F1F24060 2884 2568 HEAD12 DC    CL36'RTN 12 - DISPLAY END OF TEST MESSAGE'
    2869 40C4C9E2D7D3C1E8       2568
    2871 40C5D5C440D6C640       2568
    2879 E3C5E2E340D4C5E2       2568
    2881 E2C1C7C5               2568
    2885 C1E3E3C1C3C84B40 2895 2569 ATTNOR DC    CL17'ATTACH. NOT READY'
    288D D5D6E340D9C5C1C4       2569
    2895 E8                     2569
                                2570
    2896 D5D6E340D9C4E861 28A7 2571 UNITNR DC    CL18'NOT RDY/UNIT CHECK'
    289E E4D5C9E340C3C8C5       2571
    28A6 C3D2                   2571
    28A8 C9D5E34B40D9C5D8 28BB 2572 NOTAVL DC    CL20'INT. REQ./NOT AVAIL.'
    28B0 4B61D5D6E340C1E5       2572
    28B8 C1C9D34B               2572
    28BC D5D640C9D5E3C5D9 28C7 2573 NOINTR DC    CL12'NO INTERRUPT'
    28C4 D9E4D7E3               2573
    28C8 C9E3C240C9D5E340 28D4 2574 ITBMSG DC    CL13'ITB INT ERROR'
    28D0 C5D9D9D6D9             2574
    28D5 C1E3E3C1C3C8D4C5 28E4 2575 ATTMSG DC    CL16'ATTACHMENT CHECK'
    28DD D5E340C3C8C5C3D2       2575
    28E5 C9D5E340D7D5C440 28F2 2576 INTPND DC    CL14'INT PND NOT ON'
    28ED D5D6E340D6D5           2576
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    28F3 C1E3E3C1C3C84040 2903 2577 HBUSY  DC    CL17'ATTACH. HUNG BUSY'
    28FB C8E4D5C740C2E4E2       2577
    2903 E8                     2577
    2904 C4C1E3C140D4C9E2 2912 2578 MISDAT DC    CL15'DATA MISCOMPARE'
    290C C3D6D4D7C1D9C5         2578
    2913 E4D5C5E7D7C5C3E3 2925 2579 UNEXP  DC    CL19'UNEXPECTED RESPONSE'
    291B C5C440D9C5E2D7D6       2579
    2923 D5E2C5                 2579
    2926 D9E5C940E3D640E2 2932 2580 RVIMSG DC    CL13'RVI TO SELECT'
    292E C5D3C5C3E3             2580
    2933 C5D6E340E3D640C3 293C 2581 EOTMSG DC    CL10'EOT TO CMD'
    293B D4C4                   2581
    293D C4C5E54B40C8E4D5 294A 2582 DVBMSG DC    CL14'DEV. HUNG BUSY'
    2945 C740C2E4E2E8           2582
    294B E4D5C5E7D7C5C3E3 2959 2583 UNWACK DC    CL15'UNEXPECTED WACK'
    2953 C5C440E6C1C3D2         2583
    295A E4D5D2D5D6E6D540 2969 2584 UNKOW  DC    CL16'UNKNOWN RESPONSE'
    2962 D9C5E2D7D6D5E2C5       2584
    296A C9D5C3D6D9D9C5C3 297B 2585 INCORM DC    CL18'INCORRECT RESPONSE'
    2972 E340D9C5E2D7D6D5       2585
    297A E2C5                   2585
    297C C1C3C3C5D7E3C5C4 298E 2586 ACCINM DC    CL19'ACCEPTED INV. ADDR.'
    2984 40C9D5E54B40C1C4       2586
    298C C4D94B                 2586
    298F D9C5E2D7D6D5E2C5 299E 2587 RSBEOT DC    CL16'RESPONSE S/B EOT'
    2997 40E261C240C5D6E3       2587
    299F E6D9D6D5C740E2E3 29AF 2588 WRSTMG DC    CL17'WRONG STATUS REC.'
    29A7 C1E3E4E240D9C5C3       2588
    29AF 4B                     2588
    29B0 D4C9C3D9D640C3D6 29C4 2589 MICNLM DC    CL21'MICRO CODE NOT LOADED'
    29B8 C4C540D5D6E340D3       2589
    29C0 D6C1C4C5C4             2589
    29C5 E4D5C5E7D74B40C9 29E8 2590 MPMG1  DC    CL36'UNEXP. INTR. AFTER CONT. POLL ISSUED'
    29CD D5E3D94B40C1C6E3       2590
    29D5 C5D940C3D6D5E34B       2590
    29DD 40D7D6D3D340C9E2       2590
    29E5 E2E4C5C4               2590
    29E9 D5D640C9D5E3D94B 2A1B 2591 MPMG2  DC    CL51'NO INTR. AFTER 2 SEC. T.O. ISSUED DURING CONT. POLL'
    29F1 40C1C6E3C5D940F2       2591
    29F9 40E2C5C34B40E34B       2591
    2A01 D64B40C9E2E2E4C5       2591
    2A09 C440C4E4D9C9D5C7       2591
    2A11 40C3D6D5E34B40D7       2591
    2A19 D6D3D3                 2591
    2A1C C9D5C3D6D9D9C5C3 2A46 2592 MPMG3  DC    CL43'INCORRECT STATUS RECEIVED DURING CONT. POLL'
    2A24 E340E2E3C1E3E4E2       2592
    2A2C 40D9C5C3C5C9E5C5       2592
    2A34 C440C4E4D9C9D5C7       2592
    2A3C 40C3D6D5E34B40D7       2592
    2A44 D6D3D3                 2592
    2A47 C3C1D940D5D6E340 2A5A 2593 MPMG4  DC    CL20'CAR NOT EQUAL TO SAR'
    2A4F C5D8E4C1D340E3D6       2593
    2A57 40E2C1D9               2593
    2A5B D9C5E2D7D6D5E2C5 2A71 2594 MPMG5  DC    CL23'RESPONSE WAS NOT STATUS'
    2A63 40E6C1E240D5D6E3       2594
    2A6B 40E2E3C1E3E4E2         2594
    2A72 C5D9C1E2C540C1D3 2A8C 2595 EAUMG  DC    CL27'ERASE ALL UNPROTECTED ERROR'
    2A7A D340E4D5D7D9D6E3       2595
    2A82 C5C3E3C5C440C5D9       2595
    2A8A D9D6D9                 2595
    2A8D C4C9C1D340C5C2C3 2AB6 2596        DC    CL42'DIAL EBCDIC CHAR. TO BE REPEATED INTO DATA'
    2A95 C4C9C340C3C8C1D9       2596
    2A9D 4B40E3D640C2C540       2596
    2AA5 D9C5D7C5C1E3C5C4       2596
    2AAD 40C9D5E3D640C4C1       2596
    2AB5 E3C1                   2596
    2AB7 40E2E640F38BF44B 2ACE 2597 R04MG  DC    CL24' SW 3,4.  RESET HALT F3.'
    2ABF 4040D9C5E2C5E340       2597
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    2AC7 C8C1D3E340C6F34B       2597
    2ACF C3C1E4E3C9D6D540 2AFE 2598 R04MG2 DC    CL48'CAUTION - ERRORS MAY OCCUR IF CHAR. IS NOT VALID'
    2AD7 6040C5D9D9D6D9E2       2598
    2ADF 40D4C1E840D6C3C3       2598
    2AE7 E4D940C9C640C3C8       2598
    2AEF C1D94840C9E240D5       2598
    2AF7 D6E340E5C1D3C9C4       2598
    2AFF D5D640C5D9D9D6D9 2B06 2599 NOERR  DC    CL8'NO ERROR'
    2B07 C4C5E5C9C3C540E7 2B0F 2600 DEVMG  DC    CL9'DEVICE XX'
    2B0F E7                     2600
    2B10 40C1E5C1C9D3C1C2 2B19 2601 AVALMG DC    CL10' AVAILABLE'
    2B18 D3C5                   2601
                          2B1A 2602 STTAB  EQU   *                    STATUS BIT NAMES - KEEP IN ORDER
    2B1A D6D7C5D9C1E3C9D6 2B29 2603        DC    CL16'OPERATION CHECK '
    2B22 D540C3C8C5C3D240       2603
    2B2A C3D6D5E3D9D6D340 2B39 2604        DC    CL16'CONTROL CHECK   '
    2B32 C3C8C5C3D2404040       2604
    2B3A C4C1E3C140C3C8C5 2B49 2605        DC    CL16'DATA CHECK      '
    2B42 C3D2404040404040       2605
    2B4A C5D8E4C9D7D4C5D5 2B59 2606        DC    CL16'EQUIPMENT CHECK '
    2B52 E340C3C8C5C3D240       2606
    2B5A C9D5E3C5D9E5C5D5 2B69 2607        DC    CL16'INTERVENTION REQ'
    2B62 E3C9D6D540D9C5D8       2607
    2B6A C3D6D4D4C1D5C440 2B79 2608        DC    CL16'COMMAND REJECT  '
    2B72 D9C5D1C5C3E34040       2608
    2B7A C4C5E5C9C3C540C5 2B89 2609        DC    CL16'DEVICE END      '
    2B82 D5C4404040404040       2609
    2B8A E4D5C9E340E2D7C5 2B99 2610        DC    CL16'UNIT SPECIFY    '
    2B92 C3C9C6E840404040       2610
    2B9A C4C5E5C9C3C540C2 2BA9 2611        DC    CL16'DEVICE BUSY     '
    2BA2 E4E2E84040404040       2611
                                2612
    2BAA E2E3C1E3E4E240D9 2BC7 2613 STATMS DC    CL30'STATUS RECEIVED FROM DEVICE XX'
    2BB2 C5C3C5C9E5C5C440       2613
    2BBA C6D9D6D440C4C5E5       2613
    2BC2 C9C3C540E7E7           2613
    2BC8 E2E3C1E3E4E240C5 2BE5 2614 STATME DC    CL30'STATUS EXPECTED FROM DEVICE XX'
    2BD0 E7D7C5C3E3C5C440       2614
    2BD8 C6D9D6D440C4C5E5       2614
    2BE0 C9C3C540E7E7           2614
    2BE6                  2C03 2615 STATFL DS    30CL1               PRINT FIELD
    2C04 40                     2616 STATBL DC    CL1' '              BLANK FOR PRINT FIELD
                                2617
    2C05 C9C640C4C5E5C9C3 2C34 2618        DC    CL48'IF DEVICE SHOULD BE AVAILABLE AND IS NOT, CHECK '
    2C0D C540E2C8D6E4D3C4       2618
    2C15 40C2C540C1E5C1C9       2618
    2C1D D3C1C2D3C540C1D5       2618
    2C25 C440C9E240D5D6E3       2618
    2C2D 6B40C3C8C5C3D240       2618
    2C35 C3D6C1E740C3C1C2 2C5A 2619 RT1MG1 DC    CL38'COAX CABLES AND/OR REFER TO THE DEVICE'
    2C3D D3C5E240C1D5C461       2619
    2C45 D6D940D9C5C6C5D9       2619
    2C4D 40E3D640E3C8C540       2619
    2C55 C4C5E5C9C3C5           2619
    2C5B E3D9D6E4C2D3C5E2 2C8C 2620        DC    CL50'TROUBLESHOOTING GUIDE.  SSW 01 MAY BE SET TO LOOP '
    2C63 C8D6D6E3C9D5C740       2620
    2C6B C7E4C9C4C54B4040       2620
    2C73 E2E2E640F0F140D4       2620
    2C7B C1E840C2C540E2C5       2620
    2C83 E340E3D640D3D6D6       2620
    2C8B D740                   2620
    2C8D D9E3D540F0F140C6 2CAA 2621 RT1MG2 DC    CL30'RTN 01 FOR CONTINUOUS POLLING.'
    2C95 D6D940C3D6D5E3C9       2621
    2C9D D5E4D6E4E240D7D6       2621
    2CA5 D3D3C9D5C74B           2621
    2CAB C9C640C4C5E5C9C3 2CDB 2622        DC    CL49'IF DEVICE IS A PRINTER, CHECK FOR FORMS PROPERLY '
    2CB3 C540C9E240C140D7       2622
    2CBB D9C9D5E3C5D96B40       2622
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    2CC3 C3C8C5C3D240C6D6      2622
    2CCB D940C6D6D9D4E240      2622
    2CD3 D7D9D6D7C5D9D3E8      2622
    2CDB 40                    2622
    2CDC C9D5E2C5D9E3C5C4 2CF1 2623 RT1MG3 DC    CL22'INSERTED, ON LINE ETC.'
    2CE4 6B40D6D546J3C9D5      2623
    2CEC C540C5E3C34B          2623
    2CF2 D6D5D3E840C1E5C1 2D22 2624       DC    CL49'ONLY AVAILABLE DEVICES WILL BE USED IN FOLLOWING '
    2CFA C9D3C1C2D3C540C4      2624
    2D02 C5E5C9C3C5E240E6      2624
    2D0A C9D3D340C2C540E4      2624
    2D12 E2C5C440C9D540C6      2624
    2D1A D6D3D3D6E6C9D5C7      2624
    2D22 40                    2624
    2D23 D9D6E4E3C9D5C5E2 2D40 2625 RT1MG  DC    CL30'ROUTINES. RESET HALT TO GO ON.'
    2D2B 4B40D9C5E2C5E340      2625
    2D33 C8C1D3E340E3D640      2625
    2D3B C7D640D6D54B          2625
    2D41 D9C5E2C5E340C8C1 2D61 2626 RSTHMG DC    CL33'RESET HALT TO FETCH DEVICE STATUS'
    2D49 D3E340E3D640C6C5      2626
    2D51 E3C3C840C4C5E5C9      2626
    2D59 C3C540E2E3C1E3E4      2626
    2D61 E2                    2626
                          2D62 2627 WRTRT2 EQU   *
    2D62 0227F55A         2D65 2628       DC    XL4'0227F55A'       STX,ESC,ER/WRITE,WCC=START PRINT
    2D66 C4C5E5C9C3C540E7 2D6E 2629 DEVRT2 DC    CL9'DEVICE XX'
    2D6E E7                    2629
    2D6F 11404003         2D72 2630 EWRT2  DC    XL4'11404003'       SBA, ADDR 0, ETX
                          2D73 2631 EXPBUF EQU   *                   EXPECTED DATA BUFFER
    2D73                  2E92 2632       DS    288CL1
    2E93 FF               2E93 2633 EXFIL  DC    XL1'FF'             FILL CHAR FOR EXP. DATA BUFFER
    2E94 00               2E94 2634 RBFLG  DC    XL1'0'              READ BUFFER FLAGS
    2E95 0240FF60         2E98 2635 RBEX1  DC    XL4'0240FF60'       READ BUFFER HEADING
                          2E99 2636 RIPDAT EQU   *
    2E99                  2EAA 2637 RIPHD  DS    18CL1               RIPPLE DATA HEADER
    2EAB C1C2C3C4C5C6C7C8 2ECE 2638       DC    CL36'ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789'
    2EB3 C9D1D2D3D4D5D6D7      2638
    2EBB D8D9E2E3E4E5E6E7      2638
    2EC3 E8E9F0F1F2F3F4F5      2638
    2ECB F6F7F8F9              2638
    2ECF 405060614A5A7A4B 2EEA 2639 RIPDT  DC    CL28' &-/  :.$,#<*%@()_''+;>=|¬?" '
    2ED7 5B6B7B4C5C6C7C4D      2639
    2EDF 5D6D7D4E5E6E7E4F      2639
    2EE7 5F6F7F6A              2639
    2EEB FF               2EEB 2640       DC    XL1'FF'             RIPPLE DATA TERMINATOR
                          2EEC 2641 NULL   EQU   *
    2EEC 00FF             2EED 2642       DC    XL2'00FF'           NULL DATA
    2EEE 0000             2EEF 2643 CURDAT DC    XL2'0'              CURRENT DATA ADDRESS
    2EF0 0000             2EF1 2644 STDAT  DC    XL2'0'              START DATA ADDRESS
                          2EF2 2645 PBUF   EQU   *                   PRINT BUFFER KEEP FIELDS IN ORDER
    2EF2 0000             2EF3 2646 LINADR DC    XL2'0'              1
    2EF4                  2EF5 2647       DS    CL2                 2
    2EF6                  2F15 2648 EXPFL  DS    32CL1               3
    2F16                  2F19 2649       DS    CL4                 4
    2F1A                  2F39 2650 RECFL  DS    32CL1               5
    2F3A 40               2F3A 2651 PBUFBL DC    CL1' '              6
    2F3B                  2F84 2652 PLINE  DS    74CL1               PRINT LINE BUFFER
    2F85 40               2F85 2653 PLINBL DC    CL1' '              BLANK FOR PRINT LINE
    2F86 C1C4C4D9404040F0 2FAB 2654 PHEADA DC    CL38'ADDR   0 1 2 3 4 5 6 7 8 9 A B C D E F'
    2F8E 40F140F240F340F4      2654
    2F96 40F540F640F740F8      2654
    2F9E 40F940C140C240C3      2654
    2FA6 40C440C540C6          2654
    2FAC 4040404040F040F1 2FCF 2655 PHEAD  DC    CL36'     0 1 2 3 4 5 6 7 8 9 A B C D E F'
    2FB4 40F240F340F440F5      2655
    2FBC 40F640F740F840F9      2655
    2FC4 40C140C240C340C4      2655
    2FCC 40C540C6              2655
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    2FD0 0000             2FD1 2656 HEADAD DC    XL2'0'
    2FD2 C6C6C6C6C6C6C6C6 2FF1 2657 FFFF   DC    32CL1'F'
    2FDA C6C6C6C6C6C6C6C6      2657
    2FE2 C6C6C6C6C6C6C6C6      2657
    2FEA C6C6C6C6C6C6C6C6      2657
    2FF2 0010             2FF3 2658 SIXTEN DC    IL2'16'
    2FF4 4320             2FF5 2659 ENDP   DC    AL2(XMITRC+288)
    2FF6 2F84             2FF7 2660 ELIN   DC    AL2(PLINE)
    2FF8 0000             2FF9 2661 WORK   DC    XL2'0'
    2FFA 1070             2FFB 2662 ACK    DC    XL2'1070'           ACK 0 OR 1
    2FFC 00               2FFC 2663 TCOUNT DC    XL1'0'
    2FFD 00               2FFD 2664 RTNFLG DC    XL1'0'              MODEL 2 AND PRINTER FLAGS
    2FFE C5E7D7C5C3E3C5C4 3005 2665 EXP    DC    CL8'EXPECTED'
    3006 D9C5C3C5C9E5C5C4 300D 2666 RECD   DC    CL8'RECEIVED'
    300E C4C9C1D340C1C4C4 303D 2667       DC    CL48'DIAL ADDR OF DEVICE/S YOU WISH TO TEST INTO DATA'
    3016 D940D6C640C4C5E5      2667
    301E C9C3C561E240E8D6      2667
    3026 E440E6C9E2C840E3      2667
    302E D640E3C5E2E340C9      2667
    3036 D5E3D640C4C1E3C1      2667
    303E 40E2E640F36BF44B 305B 2668 SETMG1 DC    CL30' SW 3,4.  DIAL FF TO END LIST.'
    3046 4040C4C9C1D340C6      2668
    304E C640E3D640C5D5C4      2668
    3056 40D3C9E2E34B          2668
    305C D9C5E2C5E340C8C1 307D 2669 SETMG2 DC    CL34'RESET HALT F0/F1 AFTER EACH ENTRY.'
    3064 D3E340C6F061C6F1      2669
    306C 40C1C6E3C5D940C5      2669
    3074 C1C3C840C5D5E3D9      2669
    307C E84B                  2669
    307E C9D5E5C1D3C9C440 3097 2670 INVMG  DC    CL26'INVALID DEVICE - TRY AGAIN'
    3086 C4C5E5C9C3C54060      2670
    308E 40E3D9E840C1C7C1      2670
    3096 C9D5                  2670
    3098 00               3098 2671 NOAID  DC    XL1'0'              NO AID CHAR 60 FOR DISP. E8 FOR PR.
    3099 00               3099 2672 SSWFL  DC    XL1'0'              SSW 11 FLAG
                          309A 2673 WRTR3  EQU   *
    309A 0227F540         309D 2674 RT3CW  DC    XL4'0227F540'       STX,ESC, CMD, WCC
    309E 1DE8             309F 2675       DC    XL2'1DE8'           SF, HI INT., PROTECTED
    30A0 5C5C5CC4C5E5C9C3 30AD 2676 DEVRT3 DC    CL14'***DEVICE XX***'
    30A8 C540E7E75C5C          2676
    30AE 1D40             30AF 2677 RT3HD  DC    XL2'1D40'           SF, NORM INT, UNPROTECT
    30B0                  30EF 2678 WRTR3R DS    64CL1               RIPPLE DATA GOES HERE
    30F0 03               30F0 2679 EWRT3  DC    XL1'03'             ETX
                          30F1 2680 UNLOCK EQU   *                   CMD SEQUENCE TO UNLOCK DEVICE
    30F1 0227F1C203       30F5 2681 UNLOCE DC    XL5'0227F1C203'     STX,ESC,WRITE,UNLOCK,ETX
                          30F6 2682 ORD1   EQU   *                   BEGIN ORDERS FOR TEST 1
    30F6 0227             30F7 2683       DC    XL2'0227'           STX-ESC
    30F8 F5               30F8 2684       DC    XL1'F5'             CMD-ERASE,WRITE
    30F9 5F               30F9 2685       DC    XL1'5F'             WCC  SOUND ALARM/RESTORE KEYBOARD/
                               2686 *                                   START PRINT-40 CHAR LINE
    30FA 11               30FA 2687       DC    XL1'11'             SBA
    30FB 40C6             30FC 2688       DC    XL2'40C6'           ADDRESS--6
    30FD E3C5E2E340D7C1E3 3113 2689       DC    CL23'TEST PATTERN SEQUENCING. BEGIN MESSAGE
    3105 E3C5D9D540E2C5D8      2689
    310D E4C5D5C3C9D5C7        2689
                               2690 *
    3114 11               3114 2691       DC    XL1'11'             SBA
    3115 C150             3116 2692       DC    XL2'C150'           ADDRESS-80
    3117 F14840D7D9C5E2E2 3138 2693       DC    CL34'1. PRESS TEST REQUEST TO CALL NEXT'
    311F 40E3C5E2E340D9C5      2693
    3127 D8E4C5E2E340E3D6      2693
    312F 40C3C1D3D340D5C5      2693
    3137 E7E3                  2693
                               2694 *
    3139 11               3139 2695       DC    XL1'11'             SBA
    313A C2E2             313B 2696       DC    XL2'C2E2'           ADDRESS--162
    313C E2C5D8E4C5D5E3C9 314E 2697       DC    CL19'SEQUENTIAL PATTERN.'
    3144 C1D340D7C1E3E3C5      2697
```

8943 DA FUNCTIONAL TESTS

ERR LOC	OBJECT CODE	ADDR	S[illegible]	[illegible]
3295	03	3295		E ORR D LARA DC X L [illegible] 38' ET X
		3296		ORED 2 EQU * BEG [illegible] DERS FOR TEST 2
3296	0227	3297		DC X L [illegible] 27' STX ESC
3298	F5	3298		DC X L [illegible] 5' CMD ERASE,WRITE
3299	5F	3299		DC X L [illegible] F' WCC SOUND ALARM/RESTORE KEYBOARD/
				S TART PRINT/40 CHAR LINE
329A	11	329A		DC X L [illegible] 1 ' SBA
329B	C150	329C		DC X L [illegible] 50' ADDR 80
329D	1D60	329E		DC X L [illegible] 60' PROT ECTED,NORMAL INTENSITY
329F	C1C2C3C4C5C6C7C8	32B9		DC C L [illegible] ' ABCDEFGHIJKLMNOPQRST UVWXYZ ' BEGIN MESSAGE
32A7	C9D1D2D3D4D5D6D7			
32AF	D8D9E2E3E4E5E6E7			
32B7	E8E940			
32BA	1D6C	32BB		DC X L [illegible] 6C' PROT ECTED,NON DISPLAY
32BC	D5D6D540C4C9E2D7	32C6		DC C L [illegible] ' NON DISPLAY' FOLD INSERT IN NON-DISPLAY AREA
32C4	D3C1E8			
32C7	11	32C7		DC X L [illegible] 1 ' SBA
32C8	C260	32C9		DC X L [illegible] 260' ADDR 160
32CA	1D40	32CB		DC X L [illegible] 40' UNPROT ERASE CTED,NORMAL INTENSITY
32CC	13	32CC		DC X L [illegible] 3' INSERT CURSOR
32CD	C3D6D7E840C1C2D6	32E7		DC C L [illegible] ' COPY ABOVE IN THIS LINE
32D5	E5C540C9D540E3C8			
32DD	C9E240D3C9D5C540			
32E5	404040			
32E8	1D40	32E9		DC X L [illegible] 40' NORMAL INTENSITY/UNPROTECTED
32EA	C9D5E2C5D9E340C3	32F2		DC C L [illegible] ' INSERT CK'
32F2	D2			
32F3	0000	32F4		DC X L [illegible] 00' 2 EQUAL L CHARACTERS
32F5	1D60	32F6		DC X L [illegible] 60' PROT E CT ED,NORMAL INTENSITY
32F7	11	32F7		DC X L [illegible] ' SBA
32F8	C3F0	32F9		DC X L [illegible] 3F0' ADDR 240
32FA	1DE8	32FB		DC X L [illegible] E8' PROT E CT ED,HIGH INTENSITY
32FC	4F7C7B5B6C	3300		DC C L [illegible] '#$%' SPEC I AL
3301	4A	3301		DC X L [illegible] ' CHAR ACTERS (CENT SIGN)
3302	505C4D5D6D4F	3307		DC C L [illegible] .<()_+' TEST
3308	5A	3308		DC X L [illegible] $' (EXCLAMATION)
3309	7A	3309		DC X L [illegible] :'
330A	7F	330A		DC X L [illegible] =' (QUOTE)
330B	4C6E6F607E5F5E7D	3313		DC C L [illegible] <>?-;''/'
3313	61			
3314	1DF8	3315		DC X L [illegible] F8' PROT E CT ED,HIGH INTENSITY
3316	F0F1F2F3F4F5F6F7	3323		DC C L [illegible] ' 0123456789,.-A' NUME RIC FIELD
331E	F8F96B4B60C1			
3324	11	3324		DC X L [illegible] ' SBA
3325	C540	3326		DC X L [illegible] 540' ADDR 320
3327	1DC8	3328		DC X L [illegible] C8' UNPROT ERASE CTED,HIGH INTENSITY
3329	C3D6D7E840C1C2D6	3340		DC C L [illegible] ' COPY ABOVE IN THIS LINE INSTRUCTIONS TO CONSOLE
3331	E5C540C9D540E3C8			
3339	C9E240D3C9D5C540			
3341	1DD8	3342		DC X L [illegible] D8' NUME RIC , UNPROTECTED, HIGH INTENSITY
3343	11	3343		DC X L [illegible] ' SBA
3344	C5E8	3345		DC X L [illegible] 5E8' ADDR 360
3346	1D60	3347		DC X L [illegible] 60' PROT E CT ED,NORMAL INTENSITY
3348	11	3348		DC X L [illegible] ' SBA
3349	C650	334A		DC X L [illegible] 650' ADDR 400
334B	1DE4	334C		DC X L [illegible] E4' PROT E CT ED,NORMAL INTENSITY,SELECTOR
334D	6FE2C5D340D7C5D5	3359		DC C L [illegible] ' SEL PEN TEST' DEFINE SEL L PEN AREA
3355	40E3C5E2E3			

INT ON

IN

CROSS-REFERENCE

1950 1963

0928 0937 0961 0985 1014 1046 1234

1551 1583 1619 2443
1449* 1456* 1458 1475

1538

1575

1076 1149 1172*
1986*
0541 0710 0768 0817 1056 1069 1248 1485* 1488*
1493* 1494* 1501 1515 1716 1747 1861 2131 2415
1434 1436* 1881
2328

2143 2146 2202
0776
2218*

0253*

0353 0416 0525 0568 0569 1363 1516 1517 1518

0279* 0310 1503*
0274 0321
0674 1074 1302 1763 2138 2168 2201
1733 1737
0498 0526 0532 0571 0577 0589 0624 0667 0685
0807 0824 0834 1060 1114 1120 1144 1155 1164
1243 1279 1310 1337 1365 1370 1417 1667 1720
1959 2158 2173 2178
1639*

2135* 2136 2162 2162* 2163* 2166 2196 2196* 2204

6869*
57677787

SB
11
SF R PROTECTED/NORMAL INTENSITY

C7C8C9*

D7D8D9*

E8E9*
5F6F7F8F

SB A
15
SF TR UNPROTECTED/NORMAL INTEN.

E0E1*

SB A
19
SF TR PROTECTED/NORMAL INTENSITY

SB
23
SF T TR UNPROTECTED/NORMAL INTENSITY

SB
2
SF T TR PROTECTED/NORMAL INTENSITY

SB
320

END OF MESSAGE (ALT.CODES)

SB
3
SF TER UNPROTECTED/NORMAL INTENSITY

IN SERT CURSOR
S B
4 7
S F TTER HIGH INT/ PROTECTED
S E ECT I ON ADDR TO FOLLOW
S T R AG E AREA FOR SELECTION ADDR

8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   314C D9D54B                2697
                              2698 *
   314F 11                314F 2699          DC    XL1'11'              SBA
   3150 C540              3151 2700          DC    XL2'C540'            ADDRESS--320
   3152 F24B40D7D9C5E2E2  3179 2701          DC    CL40'2. PRESS CANCEL(OR PA2)TO DISCONNECT CPU'
   315A 40C3C1D5C3C5D34D      2701
   3162 D6D940D7C1F25DE3      2701
   316A D640C4C9E2C3D6D5      2701
   3172 D5C5C3E340C3D7E4      2701
                              2702 *
   317A 11                317A 2703          DC    XL1'11'              SBA
   317B C6D2              317C 2704          DC    XL2'C6D2'            ADDRESS--402
   317D C1D5C440D3C5C1E5  31A1 2705          DC    CL37'AND LEAVE PATTERN FOR OFF-LINE USAGE.'
   3185 C540D7C1E3E3C5D9      2705
   318D D540C6D6D940D6C6      2705
   3195 C660D3C9D5C540E4      2705
   319D E2C1C7C54B            2705
                              2706 *
   31A2 11                31A2 2707          DC    XL1'11'              SBA
   31A3 C7D6              31A4 2708          DC    XL2'C7D6'            ADDRESS--470
                              2709 *
   31A5 1DE8              31A6 2710          DC    XL2'1DE8'            SF-HIGH INTENSITY/PROTECTED
   31A7 C1C4D9C0          31AA 2711          DC    CL4'ADR-'            ADDRESS OF DVC WILL FOLLOW
   31AB F6F0F4F0          31AE 2712 A1       DC    CL4'6040'            DEVICE ADDR GETS FILLED IN
                              2713 *
   31AF 1D40              31B0 2714          DC    XL2'1D40'            SF-NORMAL INT/UNPROTECTED
                              2715 *
   31B1 19                31B1 2716          DC    XL1'19'
   31B2 03                31B2 2717 EORD1    DC    XL1'03'              ETX
                          31B3 2718 ORD1A    EQU   *
   31B3 C227F55F          31B6 2719          DC    XL4'0227F55F'        STX,ESC,ER/WR,WCC  START PRINT ON
   31B7 1140C6            31B9 2720          DC    XL3'1140C6'          SBA ADR 6
   31BA E3C5E2E340D7C1E3  31D0 2721          DC    CL23'TEST PATTERN SEQUENCING'
   31C2 E3C5D9D540E2C5D8      2721
   31CA E4C5D5C3C9D5C7        2721
   31D1 11C150            31D3 2722          DC    XL3'11C150'          SBA ADDR 80
   31D4 F14B40E3D640C3C1  31FB 2723          DC    CL40'1. TO CALL NEXT PATTERN - AFTER PRINTING'
   31DC D3D340D5C5E7E340      2723
   31E4 D7C1E3E3C5D9D540      2723
   31EC 6040C1C6E3C5D940      2723
   31F4 D7D9C9D5E3C9D5C7      2723
   31FC 11C2E2            31FE 2724          DC    XL3'11C2E2'          SAB ADDR 162
   31FF E2E3D6D7E26B40D6  321E 2725          DC    CL32'STOPS, OPEN COVER, THEN CLOSE IT'
   3207 D7C5D540C3D6E5C5      2725
   320F D96B40E3C8C5D540      2725
   3217 C3D3D6E2C540C9E3      2725
   321F 11C3F2            3221 2726          DC    XL3'11C3F2'          SBA ADR 242
   3222 E6C9E3C8C9D540F5  3232 2727          DC    CL17'WITHIN 5 SECONDS.'
   322A 40E2C5C3D6D5C4E2      2727
   3232 4B                    2727
   3233 11C540            3235 2728          DC    XL3'11C540'          SBA ADR 320
   3236 F24B40C9C640C3D6  325C 2729          DC    CL39'2. IF COVER IS LEFT UP MORE THAN 5 SEC.'
   323E E5C5D940C9E240D3      2729
   3246 C5C6E340E4D740D4      2729
   324E D6D9C540E3C8C1D5      2729
   3256 40F540E2C5C34B        2729
   325D 11C6D2            325F 2730          DC    XL3'11C6D2'
   3260 D7C7D440E6C9D3D3  3284 2731          DC    CL37'PGM WILL TERMINATE AND LEAVE PATTERN.'
   3268 40E3C5D9D4C9D5C1      2731
   3270 E3C540C1D5C440D3      2731
   3278 C5C1E5C540D7C1E3      2731
   3280 E3C5D9D54B            2731
   3285 11C7D6            3287 2732          DC    XL3'11C7D6'          SBA ADDR - - 470
   3288 1DE8              3289 2733          DC    XL2'1DE8'            SF HI INT/PROT
   328A C1C4D960          328D 2734          DC    CL4'ADR-'
   328E F6F04040          3291 2735 A1A      DC    CL4'60  '            DEVICE ADDRESS GETS FILLED IN
   3292 1D40              3293 2736          DC    XL2'1D40'            SF - NORM INT./UNPROT.
   3294 19                3294 2737          DC    XL1'19'
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8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3295 03                3295 2738 EORD1A   DC    XL1'03'              ETX
                              2739
                          3296 2740 ORD2     EQU   *                    BEGIN ORDERS FOR TEST 2
   3296 0227              3297 2741          DC    XL2'0227'            STX-ESC
   3298 F5                3298 2742          DC    XL1'F5'              CMD--ERASE,WRITE
   3299 5F                3299 2743          DC    XL1'5F'              WCC SOUND ALARM/RESTORE KEYBOARD/
                                                                            START PRINT/40 CHAR LINE
                              2744 *
   329A 11                329A 2745          DC    XL1'11'              SBA
   329B C150              329C 2746          DC    XL2'C150'            ADR--80
   329D 1D60              329E 2747          DC    XL2'1D60'            PROTECTED,NORMAL INTENSITY
   329F C1C2C3C4C5C6C7C8  32B9 2748          DC    CL27'ABCDEFGHIJKLMNOPQRSTUVWXYZ ' BEGIN MESSAGE
   32A7 C9D1D2D3D4D5D6D7      2748
   32AF D8D9E2E3E4E5E6E7      2748
   32B7 E8E940                2748
                              2749 *
   32BA 1D6C              32BB 2750          DC    XL2'1D6C'            PROTECTED,NON DISPLAY
   32BC D5D6D540C4C9E2D7  32C6 2751          DC    CL11'NON DISPLAY'    FOUND IN NON-DISPLAY AREA
   32C4 D3C1E8                2751
                              2752 *
   32C7 11                32C7 2753          DC    XL1'11'              SBA
   32C8 C260              32C9 2754          DC    XL2'C260'            ADR--160
   32CA 1D40              32CB 2755          DC    XL2'1D40'            UNPROTECTED,NORMAL INTENSITY
   32CC 13                32CC 2756          DC    XL1'13'              INSERT CURSOR
   32CD C3D6D7E840C1C2D6  32E7 2757          DC    CL27'COPY ABOVE IN THIS LINE    '
   32D5 E5C540C9D540E3C8      2757
   32DD C9E240D3C9D5C540      2757
   32E5 404040                2757
                              2758 *
   32E8 1D40              32E9 2759          DC    XL2'1D40'            NORMAL INT/UNPROTECTED
   32EA C9D5E2C5D9E340C3  32F2 2760          DC    CL9'INSERT CK'
   32F2 D2                    2760
   32F3 0000              32F4 2761          DC    XL2'0000'            2 NULL CHARACTERS
                              2762 *
   32F5 1D60              32F6 2763          DC    XL2'1D60'            PROTECTED,NORMAL INTENSITY
   32F7 11                32F7 2764          DC    XL1'11'              SBA
   32F8 C3F0              32F9 2765          DC    XL2'C3F0'            ADR--240
   32FA 1DE8              32FB 2766          DC    XL2'1DE8'            PROTECTED,HIGH INTENSITY
   32FC 4F7C7B5B6C        3300 2767          DC    CL5'|@#$%'           SPECIAL
   3301 4A                3301 2768          DC    XL1'4A'               CHARACTERS (CENT SIGN)
   3302 5C5C4D5D6D4E      3307 2769          DC    CL6'&*()_+'            TEST
   3308 5A                3308 2770          DC    XL1'5A'                 *        (EXCLAMATION)
   3309 7A                3309 2771          DC    CL1':'                   *
   330A 7F                330A 2772          DC    XL1'7F'                   *     (QUOTE)
   330B 4C6E6F607E5F5E7D  3313 2773          DC    CL9'<>?-=¬;''/'            *
   3313 61                    2773
                              2774 *
   3314 1DF8              3315 2775          DC    XL2'1DF8'            PROTECTED,HIGH INTENSITY
   3316 F0F1F2F3F4F5F6F7  3323 2776          DC    CL14'0123456789,.-A' NUMERIC FIELD
   331E F8F96B4B60C1          2776
                              2777 *
   3324 11                3324 2778          DC    XL1'11'              SBA
   3325 C540              3326 2779          DC    XL2'C540'            ADR--320
   3327 1DC8              3328 2780          DC    XL2'1DC8'            UNPROTECTED,HIGH INTENSITY
   3329 C3D6D7E840C1C2D6  3340 2781          DC    CL24'COPY ABOVE IN THIS LINE '  INSTRUCTIONS TO CONSOLE
   3331 E5C540C9D540E3C8      2781
   3339 C9E240D3C9D5C540      2781
   3341 1DD8              3342 2782          DC    XL2'1DD8'            NUMERIC,UNPROTECTED, HIGH INTENSITY
                              2783 *
   3343 11                3343 2784          DC    XL1'11'              SBA
   3344 C5E8              3345 2785          DC    XL2'C5E8'            ADR--360
   3346 1D60              3347 2786          DC    XL2'1D60'            PROTECTED,NORMAL INTENSITY
                              2787 *
   3348 11                3348 2788          DC    XL1'11'              SBA
   3349 C650              334A 2789          DC    XL2'C650'            ADR--400
   334B 1DE4              334C 2790          DC    XL2'1DE4'            PROTECTED,NORMAL INTENSITY,SELECTOR
                              2791 *
   334D 6FE2C5D340D7C5D5  3359 2792          DC    CL13'?SEL PEN TEST' DEFINE SEL PEN AREA
   3355 40E3C5E2E3            2792
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   335A 000000           335C 2793        DC    XL3'000000'          3 NULL CHARACTERS
   335D 1DE8             335E 2794        DC    XL2'1DE8'            PROTECTED,HI INTEN,SELECTOR PEN
   335F 6EE2C5D340D7C5D5 336B 2795        DC    CL13'>SEL PEN TEST'  DEFINE SEL PEN FIELD
   3367 40E3C5E2E3       2795
                         2796 *
   336C 11               336C 2797        DC    XL1'11'              SBA
   336D C7D6             336E 2798        DC    XL2'C7D6'            ADR--470
                         2799 *
   336F 1DE8             3370 2800        DC    XL2'1DE8'            SF-ATTR HIGH INT/ PROTECTED
   3371 C1C4D960         3374 2801        DC    CL4'ADR-'
   3375 00000000         3378 2802 A2     DC    XL4'00000000'        NULLS FOR SEL ADDR
   3379 1DE8             337A 2803        DC    XL2'1DE8'            SF-ATTR HIGH INT/PROTECTED *
   337B 03               337B 2804 EORD2  DC    XL1'03'              ETX                        *
                         337C 2805 ORD3   EQU   *
   337C 0227             337D 2806        DC    XL2'0227'            STX-ESC
   337E F5               337E 2807        DC    XL1'F5'              CMD--ERASE,WRITE
   337F 5F               337F 2808        DC    XL1'5F'                HALT
                         2809 *
   3380 11               3380 2810        DC    XL1'11'              SBA
   3381 4040             3382 2811        DC    XL2'4040'            ADR--0
   3383 3C               3383 2812        DC    XL1'3C'              RA - REPEAT TO ADDR
   3384 40E8             3385 2813        DC    XL2'40E8'            ADDR
   3386 C5               3386 2814        DC    CL1'E'               CHAR TO BE REPEATED
   3387 C8               3387 2815        DC    CL1'H'
                         2816 *
   3388 11               3388 2817        DC    XL1'11'              SBA
   3389 C14F             338A 2818        DC    XL2'C14F'            ADR--79
   338B C8C8             338C 2819        DC    CL2'HH'
                         2820 *
   338D 11               338D 2821        DC    XL1'11'              SBA
   338E C1F7             338F 2822        DC    XL2'C1F7'            ADR--119
   3390 C8C8             3391 2823        DC    CL2'HH'
                         2824 *
   3392 11               3392 2825        DC    XL1'11'              SBA
   3393 C25F             3394 2826        DC    XL2'C25F'            ADR--159
   3395 C8C8             3396 2827        DC    CL2'HH'
                         2828 *
   3397 11               3397 2829        DC    XL1'11'              SBA
   3398 C3C7             3399 2830        DC    XL2'C3C7'            ADR--199
   339A C8C8             339B 2831        DC    CL2'HH'
                         2832 *
   339C 11               339C 2833        DC    XL1'11'              SBA
   339D C36F             339E 2834        DC    XL2'C36F'            ADR--239
   339F C8C8             33A0 2835        DC    CL2'HH'
                         2836 *
   33A1 11               33A1 2837        DC    XL1'11'              SBA
   33A2 C4D7             33A3 2838        DC    XL2'C4D7'            ADR--279
   33A4 C8C8             33A5 2839        DC    CL2'HH'
                         2840 *
   33A6 11               33A6 2841        DC    XL1'11'              SBA
   33A7 C47F             33A8 2842        DC    XL2'C47F'            ADR--319
   33A9 C8C8             33AA 2843        DC    CL2'HH'
                         2844 *
   33AB 11               33AB 2845        DC    XL1'11'              SBA
   33AC C5E7             33AD 2846        DC    XL2'C5E7'            ADR--359
   33AE C8C8             33AF 2847        DC    CL2'HH'
                         2848 *
   33B0 11               33B0 2849        DC    XL1'11'              SBA
   33B1 C64F             33B2 2850        DC    XL2'C64F'            ADR--399
   33B3 C8C8             33B4 2851        DC    CL2'HH'
                         2852 *
   33B5 11               33B5 2853        DC    XL1'11'              SBA
   33B6 C6F7             33B7 2854        DC    XL2'C6F7'            ADR--439
   33B8 C8               33B8 2855        DC    CL1'H'
                         2856 *
   33B9 11               33B9 2857        DC    XL1'11'              SBA
   33BA C35B             33BB 2858        DC    XL2'C35B'            ADR--219
   33BC F0F0             33BD 2859        DC    CL2'00'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2860 *
   33BE 11               33BE 2861        DC    XL1'11'              SBA
   33BF C4C3             33C0 2862        DC    XL2'C4C3'            ADR--259
   33C1 F0F0             33C2 2863        DC    CL2'00'
                         2864 *
   33C3 11               33C3 2865        DC    XL1'11'              SBA
   33C4 C460             33C5 2866        DC    XL2'C460'            ADR--288
   33C6 E3C5E2E340D7C1E3 33DC 2867        DC    CL23'TEST PATTERN FOR 3277-1'
   33CE E3C5D9D540C6D6D9       2867
   33D6 40F3F2F7F760F1         2867
                         2868 *
   33D8 11               33D8 2869        DC    XL1'11'              SBA
   33DE C54F             33DF 2870        DC    XL2'C54F'            ADR--335
   33E0 C1D3C9C7D5D4C5D5 33E8 2871        DC    CL9'ALIGNMENT'
   33E8 E3               2871
                         2872 *
   33E9 11               33E9 2873        DC    XL1'11'              SBA
   33EA C5F0             33EB 2874        DC    XL2'C5F0'            ADR--368
   33EC 5C               33EC 2875        DC    CL1'*'
                         2876 *
   33ED 1D40             33EE 2877        DC    XL2'1D40'            SF-ATTR UPR,NI,NSP,369
   33EF 13               33EF 2878        DC    XL1'13'              INSERT CURSOR
   33F0 E4D5D7D9D6E3C5C3 33FF 2879        DC    CL16'UNPROTECTED DATA'
   33F8 E3C5C440C4C1E3C1       2879
                         2880 *
   3400 11               3400 2881        DC    XL1'11'              SBA
   3401 C6C6             3402 2882        DC    XL2'C6C6'            ADR--390
   3403 1D60             3404 2883        DC    XL2'1D60'            SF-ATTR PRO,NI,NSP
   3405 5C               3405 2884        DC    CL1'*'
                         2885 *
   3406 11               3406 2886        DC    XL1'11'              SBA
   3407 C6F8             3408 2887        DC    XL2'C6F8'            ADR--440
   3409 3C               3409 2888        DC    XL1'3C'              REPEAT
   340A C75F             340B 2889        DC    XL2'C75F'            ADR--479
   340C C5               340C 2890        DC    CL1'E'               CHAR TO BE REPEATED
   340D C5               340D 2891        DC    CL1'E'               E FOR LAST PLACE IN BUFFER
                         2892 *
   340E 11               340E 2893        DC    XL1'11'              SBA
   340F C66D             3410 2894        DC    XL2'C66D'            ADR--429
   3411 1DE8             3412 2895        DC    XL2'1DE8'            SF-ATTR HIGH INT/PROTECTED
   3413 C1C4D960         3416 2896        DC    CL4'ADR-'            ADDRESS TO FOLLOW
   3417 00000000         341A 2897 A3     DC    XL4'00000000'        STORAGE AREA FOR SELECTION ADDR
   341B 1D60             341C 2898        DC    XL2'1D60'            SF-ATTR NORMAL INT/PROTECTED
   341D 03               341D 2899 EORD3  DC    XL1'03'              ETX
                         341E 2900 ORD4   EQU   *                    ORDERS FOR TEST 4 BEGIN HERE
   341E 0227             341F 2901        DC    XL2'0227'            STX-ESC
   3420 F5               3420 2902        DC    XL1'F5'              CMD-ERASE,WRITE
   3421 7F               3421 2903        DC    XL1'7F'              WCC-SOUND ALARM/RESTORE KEYBOARD?
                                                                         START PRINT/80 CHARS PER LINE
                         2904 *
   3422 3CC150           3424 2905        DC    XL3'3CC150'          REPEAT TO ADR
   3425 C5               3425 2906        DC    CL1'E'               80 E CHARACTERS
   3426 C8               3426 2907        DC    CL1'H'               CHAR 81=H
                         2908 *
   3427 11               3427 2909        DC    XL1'11'              SBA
   3428 C25F             3429 2910        DC    XL2'C25F'            ADR--159
   342A C6C8             342B 2911        DC    CL2'HH'
                         2912 *
   342C 11               342C 2913        DC    XL1'11'              SBA
   342D C36F             342E 2914        DC    XL2'C36F'            ADR--239
   342F C8C8             3430 2915        DC    CL2'HH'
                         2916 *
   3431 11               3431 2917        DC    XL1'11'              SBA
   3432 C47F             3433 2918        DC    XL2'C47F'            ADR--319
   3434 C8C8             3435 2919        DC    CL2'HH'
                         2920 *
   3436 11               3436 2921        DC    XL1'11'              SBA
   3437 C64F             3438 2922        DC    XL2'C64F'            ADR--399
   3439 C8C8             343A 2923        DC    CL2'HH'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              2924 *
   343B 11                 343B 2925         DC    XL1'11'             SBA
   343C C75F               343D 2926         DC    XL2'C75F'           ADR--479
   343E C8C8               343F 2927         DC    CL2'HH'
                              2928 *
   3440 11                 3440 2929         DC    XL1'11'             SBA
   3441 C7E8               3442 2930         DC    XL2'C7E8'           ADR--488
   3443 E3C5E2E340D7C1E3   3459 2931         DC    CL23'TEST PATTERN FOR 3277-2'
   344B E3C5D9D540C6D6D9        2931
   3453 40F3F2F7F760F2          2931
                              2932 *
   345A 11                 345A 2933         DC    XL1'11'             SBA
   345B C86F               345C 2934         DC    XL2'C86F'           ADR--559
   345D C8C8               345E 2935         DC    CL2'HH'
                              2936 *
   345F 11                 345F 2937         DC    XL1'11'             SBA
   3460 C87E               3461 2938         DC    XL2'C87E'           ADR--574
   3462 C1D3C9C7D5D4C5D5   346A 2939         DC    CL9'ALIGNMENT'
   346A E3                      2939
                              2940 *
   346B 11                 346B 2941         DC    XL1'11'             SBA
   346C C97F               346D 2942         DC    XL2'C97F'           ADR--639
   346E C8C8               346F 2943         DC    CL2'HH'
                              2944 *
   3470 11                 3470 2945         DC    XL1'11'             SBA
   3471 4B4F               3472 2946         DC    XL2'4B4F'           ADR--719
   3473 C8C8               3474 2947         DC    CL2'HH'
                              2948 *
   3475 11                 3475 2949         DC    XL1'11'             SBA
   3476 4C5F               3477 2950         DC    XL2'4C5F'           ADR--799
   3478 C8C8               3479 2951         DC    CL2'HH'
                              2952 *
   347A 11                 347A 2953         DC    XL1'11'             SBA
   347B 4CE7               347C 2954         DC    XL2'4CE7'           ADR--807
   347D 5C                 347D 2955         DC    CL1'*'
                              2956 *
   347E 1D40               347F 2957         DC    XL2'1D40'           UNPROTECTED, NORMAL INTENSITY
   3480 13                 3480 2958         DC    XL1'13'             INSERT CURSOR
   3481 E4D5D7D9D6E3C5C3   3494 2959         DC    CL20'UNPROTECTED AREA '
   3489 E3C5C440C1D9C5C1        2959
   3491 40404040                2959
   3495 1D60               3496 2960         DC    XL2'1D60'           PROTECTED,NORMAL INTENSITY
   3497 5C                 3497 2961         DC    CL1'*'
                              2962 *
   3498 11                 3498 2963         DC    XL1'11'             SBA
   3499 4D6F               349A 2964         DC    XL2'4D6F'           ADR--879
   349B C8C8               349C 2965         DC    CL2'HH'
                              2966 *
   349D 11                 349D 2967         DC    XL1'11'             SBA
   349E 4ED7               349F 2968         DC    XL2'4ED7'           ADR--919
   34A0 F0F0               34A1 2969         DC    CL2'00'
                              2970 *
   34A2 11                 34A2 2971         DC    XL1'11'             SBA
   34A3 4E7F               34A4 2972         DC    XL2'4E7F'           ADR--959
   34A5 C8C8               34A6 2973         DC    CL2'HH'
                              2974 *
   34A7 11                 34A7 2975         DC    XL1'11'             SBA
   34A8 4FE7               34A9 2976         DC    XL2'4FE7'           ADR--999
   34AA F0F0               34AB 2977         DC    CL2'00'
                              2978 *
   34AC 11                 34AC 2979         DC    XL1'11'             SBA
   34AD 504F               34AE 2980         DC    XL2'504F'           ADR--1039
   34AF C8C8               34B0 2981         DC    CL2'HH'
                              2982 *
   34B1 11                 34B1 2983         DC    XL1'11'             SBA
   34B2 D15F               34B3 2984         DC    XL2'D15F'           ADR--1119
   34B4 C8C8               34B5 2985         DC    CL2'HH'
                              2986 *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   34B6 11                 34B6 2987         DC    XL1'11'             SBA
   34B7 D26F               34B8 2988         DC    XL2'D26F'           ADR--1199
   34B9 C8C8               34BA 2989         DC    CL2'HH'
                              2990 *
   34BB 11                 34BB 2991         DC    XL1'11'             SBA
   34BC D37F               34BD 2992         DC    XL2'D37F'           ADR--1279
   34BE C8C8               34BF 2993         DC    CL2'HH'
                              2994 *
   34C0 11                 34C0 2995         DC    XL1'11'             SBA
                           34C1 2996 EFOR3   EQU   *
   34C1 D54F               34C2 2997         DC    XL2'D54F'           ADR--1359
   34C3 C8C8               34C4 2998         DC    CL2'HH'
                              2999 *
   34C5 11                 34C5 3000         DC    XL1'11'             SBA
   34C6 D65F               34C7 3001         DC    XL2'D65F'           ADR--1439
   34C8 C8C8               34C9 3002         DC    CL2'HH'
                              3003 *
   34CA 11                 34CA 3004         DC    XL1'11'             SBA
   34CB D76F               34CC 3005         DC    XL2'D76F'           ADR--1519
   34CD C8C8               34CE 3006         DC    CL2'HH'
                              3007 *
   34CF 11                 34CF 3008         DC    XL1'11'             SBA
   34D0 D87F               34D1 3009         DC    XL2'D87F'           ADR--1599
   34D2 C8C8               34D3 3010         DC    CL2'HH'
                              3011 *
   34D4 11                 34D4 3012         DC    XL1'11'             SBA
   34D5 5A4F               34D6 3013         DC    XL2'5A4F'           ADR--1679
   34D7 C8C8               34D8 3014         DC    CL2'HH'
                              3015 *
   34D9 11                 34D9 3016         DC    XL1'11'             SBA
   34DA 5B5F               34DB 3017         DC    XL2'5B5F'           ADR--1759
   34DC C8C8               34DD 3018         DC    CL2'HH'
                              3019 *
   34DE 11                 34DE 3020         DC    XL1'11'             SBA
   34DF 5C6F               34E0 3021         DC    XL2'5C6F'           ADR--1839
   34E1 C8                 34E1 3022         DC    CL1'H'
                              3023 *
   34E2 3C4040             34E4 3024         DC    XL3'3C4040'         LAST LINE = 80
   34E5 C5                 34E5 3025         DC    CL1'E'              CHARS OF E'S
                              3026 *
   34E6 11                 34E6 3027         DC    XL1'11'             SBA
   34E7 5CE5               34E8 3028         DC    XL2'5CE5'           ADR--1829
   34E9 1DE8               34EA 3029         DC    XL2'1DE8'           SF-ATTR HIGH INT/PROTECTED
   34EB C1C4D960           34EE 3030         DC    CL4'ADR-'           ADDR TO FOLLOW
   34EF 00000000           34F2 3031 A4      DC    XL4'00000000'       STORAGE AREA FOR SEL ADDR
   34F3 1D60               34F4 3032         DC    XL2'1D60'           SF-ATTR NORMAL INT/PROTECTED
                              3033 *
   34F5 03                 34F5 3034 EORD4   DC    XL1'03'             ETX
                           34F6 3035 ORD5    EQU   *
   34F6 0227               34F7 3036         DC    XL2'0227'           STX-ESC
   34F8 F5                 34F8 3037         DC    XL1'F5'             CMD-ERASE,WRITE
   34F9 6F                 34F9 3038         DC    XL1'6F'             WCC-START PRINT/64 CHARS PER LINE/
                                                                       SOUND ALARM/RESTORE KEYBOARD
                              3039 *
   34FA 1D60               34FB 3040         DC    XL2'1D60'           SF/NORMAL INT/PROTECTED
   34FC C6D6D940C3D3E4E2   351D 3041         DC    CL34'FOR CLUSTERED PRINTERS DATA SHOULD'
   3504 E3C5D9C5C440D7D9        3041
   350C C9D5E3C5D9E240C4        3041
   3514 C1E3C140E2C8D6E4        3041
   351C D3C4                    3041
   351E 40E2E3C1D9E340D5   353A 3042         DC    CL29' START NEXT LINE HERE ------>'
   3526 C5E7E340D3C9D5C5        3042
   352E 40C8C5D9C5406060        3042
   3536 606060606E              3042
   353B C3C8C5C3D2C9D5C7   3560 3043         DC    CL38'CHECKING PROGRAM TAB/ERASE UNPROT. TO '
   3543 40D7D9D6C7D9C1D4        3043
   354B 40E3C1C261C5D9C1        3043
   3553 E2C540E4D5D7D9D6        3043
   355B E34840E3D640            3043
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8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3561 C1C4C4D961C4E4D7 357A 3044         DC    CL26'ADDR/DUP/FIELD MARK ORDERS'
   3569 61C6C9C5D3C440D4      3044
   3571 C1D9D240D6D9C4C5      3044
   3579 D9F2                  3044
                              3045 *
   357B 11C3F0           357D 3046         DC    XL3'11C3F0'          SBA 240
   357E 13               357E 3047         DC    XL1'13'              INSERT CURSOR
   357F 1DF8             3580 3048         DC    XL2'1DF8'            AUTOSKIP,PROTECTED,HIGH INTENSITY
   3581 3CC5F0F1         3584 3049         DC    XL4'3CC5F0F1'        RA 320 (1'S)
                              3050 *
   3585 1DC8             3586 3051         DC    XL2'1DC8'            UNPROTECTED,HIGH INTENSITY
   3587 3CC650           3589 3052         DC    XL3'3CC650'          RA 400 (A'S)
   358A C1               358A 3053         DC    CL1'A'               REPEATED CHARACTER
                              3054 *
   358B 1D60             358C 3055         DC    XL2'1D60'            PROTECTED,NORMAL INTENSITY
   358D 3CC75F           358F 3056         DC    XL3'3CC75F'          RA   479 (B'S)
   3590 C2               3590 3057         DC    CL1'B'               REPEATED CHARACTER
                              3058 *
   3591 11               3591 3059         DC    XL1'11'              SBA  (1 IS TO PRECEDE PROGRAN TAB)
   3592 C4D7             3593 3060         DC    XL2'C4D7'            279
   3594 F1               3594 3061         DC    CL1'1'
   3595 05               3595 3062         DC    XL1'05'              PROGRAM TAB
                              3063 *
   3596 11C5E8           3598 3064         DC    XL3'11C5E8'          SBA 360
   3599 12C650           359B 3065         DC    XL3'12C650'          EUA 400
                              3066 *
   359C 11               359C 3067         DC    XL1'11'              SBA
   359D C64A             359E 3068         DC    XL2'C64A'            394
   359F 1C1E1519         35A2 3069         DC    XL4'1C1E1519'        DUP/FIELD MARK/NEW LINE/EOM
                              3070 *
   35A3 11               35A3 3071         DC    XL1'11'              SBA
   35A4 C3E6             35A5 3072         DC    XL2'C3E6'            230
   35A6 1DE8             35A7 3073         DC    XL2'1DE8'            SF-ATTR HIGH INT/PROTECTED
   35A8 C1C4D960         35AB 3074         DC    CL4'ADR-'            SELECTION ADDRESS TO FOLLOW
   35AC 00000000         35AF 3075 A5      DC    XL4'00000000'        STORAGE AREA FOR SELECTION ADDR
                              3076 *
   35B0 1D60             35B1 3077         DC    XL2'1D60'            SF-ATTR NORHAL INT/PROTECTED
   35B2 03               35B2 3078 EORD5   DC    XL1'03'              ETX
                         35B3 3079 ORD6    EQU   *
   35B3 0227             35B4 3080         DC    XL2'0227'            STX-ESC
   35B5 F5               35B5 3081         DC    XL1'F5'              CMD-ERASE,WRITE
                              3082 * UNIVERSAL 3270 TEST PATTERN (RFT MESSAGE)
   35B6 4F               35B6 3083         DC    XL1'4F'              WCC  SOUND ALARM/RESTORE KEYBOARD/
                              3084 *                                     START PRINT/132 CHARS PER LINE
   35B7 8182838485868788 35C4 3085         DC    XL14'8182838485868788898A8C8D8E8F'
   35BF 898A8C8D8E8F          3085
   35C3 9091929394959697 35D2 3086         DC    XL14'909192939495969798999A9D9E9F'
   35CD 98999A9D9E9F          3086
                              3087 *
   35D3 11               35D3 3088         DC    XL1'11'              SBA
   35D4 40E7             35D5 3089         DC    XL2'40E7'            39
   35D6 1D60             35D7 3090         DC    XL2'1D60'            SF-ATTR PROTECTED/NORMAL INTENSITY
                              3091 *
   35D8 A2A3A4A5A6A7A8A9 35E4 3092         DC    XL13'A2A3A4A5A6A7A8A9AAACADAEAF'
   35E0 AAACADAEAF            3092
   35E5 BABBBCBDBEBF808B 35F1 3093         DC    XL13'BABBBCBDBEBF808B9B9CA0A1AB'
   35ED 9B9CA0A1AB            3093
   35F2 B0B1B2B3B475B687 35FB 3094         DC    XL10'B0B1B2B3B475B687B879'
   35FA B879                  3094
                              3095 *
   35FC 11               35FC 3096         DC    XL1'11'              SBA
   35FD C14F             35FE 3097         DC    XL2'C14F'            79
   35FF 1D40             3600 3098         DC    XL2'1D40'            SF-ATTR  UNPROTECTED/NORMAL INTEN.
                              3099 *
   3601 4142434445464748 3609 3100         DC    XL9'4142434445464748 49'
   3609 49                    3100
   360A 5152535455565758 3612 3101         DC    XL9'5152535455565758 59'
   3612 59                    3101
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8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3613 6263646566676869 361A 3102         DC    XL8'6263646566676869'
   3618 7071727374757677 3624 3103         DC    XL10'70717273747576777879'
   3623 7879                  3103
                              3104 *
                         3625 3105 MIDOR6  EQU   *
                         0072 3106 L16     EQU   *-ORD6
                              3107 *
   3625 11               3625 3108         DC    XL1'11'              SBA
   3626 C1F7             3627 3109         DC    XL2'C1F7'            119
   3628 1D60             3629 3110         DC    XL2'1D60'            SF-ATTR  PROTECTED/NORMAL INTENSITY
                              3111 *
   362A C1C2C3C4C5C6C7C8 3632 3112         DC    XL9'C1C2C3C4C5C6C7C8C9'
   3632 C9                    3112
   3633 D1D2D3D4D5D6D7D8 363B 3113         DC    XL9'D1D2D3D4D5D6D7D8D9'
   363B D9                    3113
   363C E2E3E4E5E6E7E8E9 3643 3114         DC    XL8'E2E3E4E5E6E7E8E9'
   3644 F0F1F2F3F4F5F6F7 364D 3115         DC    XL10'F0F1F2F3F4F5F6F7F8F9'
   364C F8F9                  3115
                              3116 *
   364E 11               364E 3117         DC    XL1'11'              SBA
   364F C25F             3650 3118         DC    XL2'C25F'            159
   3651 1D40             3652 3119         DC    XL2'1D40'            SF-ATTR  UNPROTECTED/NORMAL INTEN.
                              3120 *
   3653 40506061C0D0E0E1 365A 3121         DC    XL8'40506061C0D0E0E1'
                              3122 *
   365B 11               365B 3123         DC    XL1'11'              SBA
   365C C3C7             365D 3124         DC    XL2'C3C7'            199
   365E 1D60             365F 3125         DC    XL2'1D60'            SF-ATTR  PROTECTED/NORMAL INTENSITY
                              3126 *
   3660 4A4B4C4D4E4F     3665 3127         DC    XL6'4A4B4C4D4E4F'
   3666 5A5B5C5D5E5F     366B 3128         DC    XL6'5A5B5C5D5E5F'
                         366C 3129 MOR6    EQU   *
   366C 6A6B6C6D6E6F     3671 3130         DC    XL6'6A6B6C6D6E6F'
   3672 7A7B7C7D7E7F     3677 3131         DC    XL6'7A7B7C7D7E7F'
                              3132 *
   3678 11               3678 3133         DC    XL1'11'              SBA
   3679 C36F             367A 3134         DC    XL2'C36F'            239
   367B 1D40             367C 3135         DC    XL2'1D40'            SF-ATTR UNPROTECTED/NORMAL INTENSITY
                              3136 *
   367D CACBCCCDCECF     3682 3137         DC    XL6'CACBCCCDCECF'
   3683 DADBDCDDDEDF     3688 3138         DC    XL6'DADBDCDDDEDF'
   3689 EAEBECEDEEEF     368E 3139         DC    XL6'EAEBECEDEEEF'
   368F FAFBFCFDFE       3693 3140         DC    XL5'FAFBFCFDFE'
                              3141 *
   3694 11               3694 3142         DC    XL1'11'              SBA
   3695 C4D7             3696 3143         DC    XL2'C4D7'            279
   3697 1D60             3698 3144         DC    XL2'1D60'            SF-ATTR PROTECTED/NORMAL INTENSITY
   3699 D561D340C3C8C5C3 36A1 3145         DC    CL9'N/L CHECK'
   36A1 D2                    3145
   36A2 1585158515       36A6 3146         DC    XL5'1585158515'
                              3147 *
   36A7 11               36A7 3148         DC    XL1'11'              SBA
   36A8 C540             36A9 3149         DC    XL2'C540'            320
   36AA C5D6D440C3C8C5C3 36B2 3150         DC    CL9'EOM CHECK'
   36B2 D2                    3150
   36B3 B919             36B4 3151         DC    XL2'B919'            END OF MESSAGE (ALT.CODES)
                              3152 *
   36B5 11               36B5 3153         DC    XL1'11'              SBA
   36B6 C64F             36B7 3154         DC    XL2'C64F'            399
   36B8 1D40             36B9 3155         DC    XL2'1D40'            SF-ATTR UNPROTECTED/NORMAL INTENSITY
                              3156 *
   36BA 13               36BA 3157         DC    XL1'13'              INSERT CURSOR
   36BB 11               36BB 3158         DC    XL1'11'              SBA
   36BC C7D6             36BD 3159         DC    XL2'C7D6'            470
   36BE 1DE8             36BF 3160         DC    XL2'1DE8'            SF-ATTR HIGH INT/ PROTECTED
   36C0 C1C4D960         36C3 3161         DC    CL4'ADR-'            SELECTION ADDR TO FOLLOW
   36C4 00000000         36C7 3162 A6      DC    XL4'00000000'        STORAGE AREA FOR SELECTION ADDR
                              3163 *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   36C8 1D40             36C9 3164        DC    XL2'1D40'           SF-ATTR NORMAL INT/UNPROTECTED
   36CA 11               36CA 3165        DC    XL1'11'             SBA
   36CB C4C7             36CC 3166        DC    XL2'C4C7'           263
   36CD FF               36CD 3167        DC    XL1'FF'             INSERT PROBLEM CHARACTER
   36CE 03               36CE 3168 EORD6  DC    XL1'03'             ETX
                         011C 3169 ETEXT6 EQU   *-ORD6
                         00AA 3170 L26    EQU   *-MIDDR6
                         36CF 3171 ORD7   EQU   *
   36CF 0227             36D0 3172        DC    XL2'0227'           STX-ESC
   36D1 F5               36D1 3173        DC    XL1'F5'             CMD,ERASE-WRITE
   36D2 4F               36D2 3174        DC    XL1'4F'             WCC-RSTRE KYBRD/SND ALRM/STRT PRNT
   36D3 D5C3E640D3C9D5C5 36E9 3175        DC    CL23'NEW LINE FUNCTION CHECK'
   36DB 40C6E4D5C3E3C9D6       3175
   36E3 D540C3C8C5C3D2         3175
                               3176 *
   36EA 15               36EA 3177        DC    XL1'15'             NEW LINE
   36EB D5C5E640D3C9D5C5 36FB 3178        DC    CL17'NEW LINE FUNCTION'
   36F3 40C6E4D5C3E3C9D6       3178
   36FB D5                     3178
                               3179 *
   36FC 15               36FC 3180        DC    XL1'15'             NEW LINE
   36FD D5C5E640D3C9D5C5 3704 3181        DC    CL8'NEW LINE'
                               3182 *
   3705 15               3705 3183        DC    XL1'15'             NEW LINE
   3706 D5C5E6           3708 3184        DC    CL3'NEW'
                               3185 *
   3709 15               3709 3186        DC    XL1'15'             NEW LINE
   370A D5C5E640D3C9D5C5 3711 3187        DC    CL8'NEW LINE'
                               3188 *
   3712 15               3712 3189        DC    XL1'15'             NEW LINE
   3713 D5C5E640D3C9D5C5 3723 3190        DC    CL17'NEW LINE FUNCTION'
   3718 40C6E4D5C3E3C9D6       3190
   3723 D5                     3190
                               3191 *
   3724 15               3724 3192        DC    XL1'15'             NEW LINE
   3725 D5C5E640D3C9D5C5 373B 3193        DC    CL23'NEW LINE FUNCTION CHECK'
   372D 40C6E4D5C3E3C9D6       3193
   3735 D540C3C8C5C3D2         3193
                               3194 *
   373C 15               373C 3195        DC    XL1'15'             NEW LINE
   373D 1D4C             373E 3196        DC    XL2'1D4C'           NON DISPLAY,NON PRINT,NON DETECTABLE
   373F E3C8C9E240C4C1E3 3767 3197        DC    CL41'THIS DATA NOT VISIBLE/EOM AND N/L IGNORED'
   3747 C140D5D6E340E5C9       3197
   374F E2C9C2D3C561C5D6       3197
   3757 D440C1D5C440D561       3197
   375F D340C9C7D5D6D9C5       3197
   3767 C4                     3197
                               3198 *
   3768 1519             3769 3199        DC    XL2'1519'           NEW LINE EOM (IGNORED)
   376A 1D40             376B 3200        DC    XL2'1D40'           SF/NORMAL INT/ UNPROTECTED
                               3201 *
   376C C5D5C460D6C660D4 378A 3202        DC    CL31'END-OF-MESSAGE-TERMINATES PRINT'
   3774 C5E2E2C1C7C560E3       3202
   377C C5D9D4C9D5C1E3C5       3202
   3784 E240D7D9C9D5E3         3202
   378B 19               378B 3203        DC    XL1'19'             END OF MESSAGE
                               3204 *
   378C 15               378C 3205        DC    XL1'15'             NEW LINE
   378D F2D5C440C5D6D440 37AE 3206        DC    CL34'2ND EOM LINE NOT ON PRINTER OUTPUT'
   3795 D3C9D5C540D5D6E3       3206
   379D 40D6D540D7D9C9D5       3206
   37A5 E3C5D940D6E4E3D7       3206
   37AD E4E3                   3206
   37AF 19               37AF 3207        DC    XL1'19'             END OF MESSAGE
                               3208 *
   37B0 11               37B0 3209        DC    XL1'11'             SBA
   37B1 C7D6             37B2 3210        DC    XL2'C7D6'           470
   37B3 1DE8             37B4 3211        DC    XL2'1DE8'           SF-ATTR HIGH INT/PROTECTED
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               3212 *
   37B5 C1C4D960         37B8 3213        DC    CL4'ADR-'           STORAGE AREA FOR SELECTION ADDR
   37B9 00000000         37BC 3214 A7     DC    XL4'00000000'       STORAGE AREA FOR SELECTION ADDR
                               3215 *
   37BD 1D40             37BF 3216        DC    XL2'1D40'           SF-ATTR NORMAL INT/UNPROTECTED
   37BF 03               37BF 3217 EORD7  DC    XL1'03'             ETX
   37C0 0020             37C1 3218 THREE2 DC    IL2'32'
   37C2 421F             37C3 3219 STXRP  DC    AL2(XMITRC+31)
   37C4 431F             37C5 3220 SPXRP  DC    AL2(XMITRC+287)
   37C6 C1C3C3D6D9C4C9D5 37E7 3221 MODMG1 DC    CL34'ACCORDING TO ROUTINE 02, DEVICE XX'
   37CE C740E3D640D9D6E4       3221
   37D6 E3C9D5C540F0F26B       3221
   37DE 40C4C5E5C9C3C540       3221
   37E6 E7E7                   3221
   37E8 40C9E240C140D4D6 37F4 3222 MODMG2 DC    CL13' IS A MODEL X'
   37F0 C4C5D340E7             3222
   37F5 4040404040404040 37FC 3223 MODMG3 DC    CL8'        '
   37FD D7D9C9D5E3C5D9   3803 3224 PRINTR DC    CL7'PRINTER'
   3804 C4C9E2D7D3C1E8   380A 3225 DISPLY DC    CL7'DISPLAY'
                         380B 3226 R4WRT  EQU   *                  PATTERN FOR ROUTINE 4
   380B 0227F14A3C4040   3811 3227        DC    XL7'0227F14A3C4040' STX,ESC,WRITE,WCC,RA 0000
   3812 5C               3812 3228 RPTCH  DC    CL1'*'              REPEAT CHARACTER
   3813 11C75F1303       3817 3229 R4WRTE DC    XL5'11C75F1303'     SBA, IC, ETX
   3818 5CFF             3819 3230 SINCHR DC    XL2'5CFF'           SINGLE CHAR REPEATED, MAY BE CHNGED
                         381A 3231 R5WRT  EQU   *                  PATTERN FOR ROUTINE 5
   381A 0227F5C2         381D 3232        DC    XL4'0227F5C2'       STX,ESC,ER/WR,WCC
   381E 1DE8             381F 3233        DC    XL2'1DE8'           SF, HI INT. PROT.
   3820 C4C5E5C9C3C540E7 3828 3234 DEVRT5 DC    CL9'DEVICE XX'
   3828 E7               3234
   3829 1DC1             382A 3235        DC    XL2'1DC1'           SF, NORM INT., UNPROT., MODIFIED
   382B 11C150           382D 3236        DC    XL3'11C150'         SBA
   382E E3C8C9E240C9E240 3842 3237 R5EXP  DC    CL21'THIS IS MODIFIED DATA'
   383C D4D6C4C9C6C9C5C4       3237
   383E 40C4C1E3C1             3237
   3843 114040           3845 3238        DC    XL3'114040'
   3846 03               3846 3239 R5WRTE DC    XL1'03'             ETX
                         3847 3240 AIDT1  EQU   *
   3847 0227F5C2         384A 3241        DC    XL4'0227F5C2'       STX,ESC,ER/WR,WCC
   384B 1D61             384C 3242        DC    XL2'1D61'           SF - PROT MODIFIED
   384D 40C4C5D7D9C5E2E2 3854 3243        DC    CL8' DEPRESS'
   3855 1D60             3856 3244        DC    XL2'1D60'           SF - PROT
   3857 E3C8C540C9D5C4C9 3880 3245        DC    CL42'THE INDICATED AID KEY - - - - IT SHOULD BE'
   385F C3C1E3C5C440C1C9       3245
   3867 C440D2C5E8406040       3245
   386F 604060406040C9E3       3245
   3877 40E2C8D6E4D3C440       3245
   387F C2C5                   3245
   3881 40C4C5E3C5C3E3C5 38AE 3246        DC    CL46' DETECTED INSTANTLY.  IF KEYIS NOT INSTALLED, '
   3889 C440C9D5E2E3C1D5       3246
   3891 E3D3E84B4040C9C6       3246
   3899 40D2C5E8C9E240D5       3246
   38A1 D6E340C9D5E2E3C1       3246
   38A9 D3D3C5C46B40           3246
   38AF C4C5D7D9C5E2E240 38D9 3247        DC    CL43'DEPRESS ANY OTHER AID KEY EXCEPT CLEAR AND '
   38B7 C1D5E840D6E3C8C5       3247
   38BF D940C1C9C440D2C5       3247
   38C7 E840C5E7C3C5D7E3       3247
   38CF 40C3D3C5C1D940C1       3247
   38D7 D5C440                 3247
   38DA C6D6D3D3D6E640C5 38EA 3248        DC    CL17'FOLLOW ERROR MSG.'
   38E2 D9D9D6D940D4E2C7       3248
   38EA 4B                     3248
   38EB 11C25F           38ED 3249        DC    XL3'11C25F'         SBA
   38EE 1DE8             38EF 3250        DC    XL2'1DE8'           SF - HI INT. PROT
   38F0 11C6F8           38F2 3251        DC    XL3'11C6F8'         SBA
   38F3 C4C5D7D9C5E2E240 3901 3252        DC    CL15'DEPRESS - ENTER'
   38FB 6040C5D5E3C5D9         3252
   3902 03               3902 3253 AIDT1E DC    XL1'03'             ETX
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8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3903 0000             3904 3254 CURAID DC    XL2'0'                 WORK SPACE FOR CURRENT AID TABLE
                         3905 3255 AIDT2  EQU   *
   3905 0227F1C2         3908 3256         DC    XL4'0227F1C2'          STX,ESC,WRITE, UNLOCK
   3909 11C6F8           390B 3257         DC    XL3'11C6F8'            SBA
   390C C4C5D7D9C5E2E240 391F 3258 AIDM   DC    CL20'DEPRESS -         '
   3914 6040404040404040      3258
   391C 40404040              3258
   3920 03               3920 3259 AIDT2E DC    XL1'03'                ETX
                         3921 3260 AIDT3  EQU   *
   3921 0227F1C2         3924 3261         DC    XL4'0227F1C2'          STX,ESC,WRITE, UNLOCK
   3925 11C260           3927 3262         DC    XL3'11C260'
   3928 C1C9C440D9C5C3C5 3944 3263 AIDRC  DC    CL29'AID RECEIVED WAS -          '
   3930 C9E5C5C440E6C1E2      3263
   3938 4060404040404040      3263
   3940 4040404040            3263
   3945 4DC8C5E7407DE7E7 394F 3264 HEXAID DC    CL11'(HEX **XX**) '
   394D 7D5D40                3264
   3950 E3D9E840C1C7C1C9 3977 3265         DC    CL40'TRY AGAIN OR DEPRESS PA-2(CNCL) TO GO ON'
   3958 D540D6D940C4C5D7      3265
   3960 D9C5E2E240D7C160      3265
   3968 F24DC3D5C3D35D40      3265
   3970 E3D640C7D640D6D5      3265
   3978 03               3978 3266 AIDT3E DC    XL1'03'                ETX
                         3979 3267 AIDT4  EQU   *
   3979 0227F1C2         397C 3268         DC    XL4'0227F1C2'          STX,ESC,WRITE, UNLOCK
   397D 11C260           397F 3269         DC    XL3'11C260'            SBA
   3980 3CC6F740         3983 3270         DC    XL4'3CC6F740'          BLANK OUT PREV MESSAGES
   3984 03               3984 3271 AIDT4E DC    XL1'03'                ETX
                         3985 3272 AIDT5  EQU   *
   3985 0227F1C2         3988 3273         DC    XL4'0227F1C2'          STX,ESC,WRITE, UNLOCK
   3989 11C540           3988 3274         DC    XL3'11C540'            SBA
   398C C3D6D9D9C5C3E340 39B3 3275         DC    CL40'CORRECT AID WAS RECEIVED, BUT RESPONSE  '
   3994 C1C9C440E6C1E240      3275
   399C D9C5C5C5C9E5C5C4      3275
   39A4 6B40C2E4E340D9C5      3275
   39AC E2D7D6D5E2C54040      3275
   39B4 E6C1E240C9D5C3D6 39D5 3276         DC    CL34'WAS INCORRECT, SEE PRINTER LOG OUT'
   39BC D9D9C5C3E36B40E2      3276
   39C4 C5C540D7D9C9D5E3      3276
   39CC C5D940D3D6C740D6      3276
   39D4 E4E3                  3276
   39D6 03               39D6 3277 AIDT5E DC    XL1'03'                ETX
   39D7 4048             39D8 3278 X4048  DC    XL2'4048'              CONSTANT 4048
   39D9 E7D4C9E361D9C5C3 39E5 3279 XMRCMG DC    CL13'XMIT/REC FLD.'
   39E1 40C6D3C448            3279
                         39E6 3280 AIDTAB EQU   *                      TABLE OF AIDS
   39E6 7DC5D5E3C5D94040 39F0 3281         DC    CL11''ENTER     '
   39EE 404040                3281
   39F1 F1D7C660F1404040 39FB 3282         DC    CL11'1PF-1      '
   39F9 404040                3282
   39FC F2D7C660F2404040 3A06 3283         DC    CL11'2PF-2      '
   3A04 404040                3283
   3A07 F3D7C660F3404040 3A11 3284         DC    CL11'3PF-3      '
   3A0F 404040                3284
   3A12 F4D7C660F4404040 3A1C 3285         DC    CL11'4PF-4      '
   3A1A 404040                3285
   3A1D F5D7C660F5404040 3A27 3286         DC    CL11'5PF-5      '
   3A25 404040                3286
   3A28 F6D7C660F6404040 3A32 3287         DC    CL11'6PF-6      '
   3A30 404040                3287
   3A33 F7D7C660F7404040 3A3D 3288         DC    CL11'7PF-7      '
   3A3B 404040                3288
   3A3E F8D7C660F8404040 3A48 3289         DC    CL11'8PF-8      '
   3A46 404040                3289
   3A49 F9D7C660F9404040 3A53 3290         DC    CL11'9PF-9      '
   3A51 404040                3290
   3A54 7AD7C660F1F04040 3A5E 3291         DC    CL11':PF-10     '
   3A5C 404040                3291
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8943 DA FUNCTIONAL TESTS

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3A5F 7BD7C660F1F14040 3A69 3292         DC    CL11'#PF-11     '
   3A67 404040                3292
                         3A6A 3293 TRSKIP EQU   *
   3A6A 7CD7C660F1F24040 3A74 3294         DC    CL11'@PF-12     '
   3A72 404040                3294
   3A75 F0E3C5E2E340D9C5 3A7F 3295         DC    CL11'0TEST REQ  '
   3A7D D84040                3295
   3A80 6CD7C160F1404040 3A8A 3296         DC    CL11'%PA-1      '
   3A88 404040                3296
   3A8B 6ED7C160F24DC3D5 3A95 3297         DC    CL11'>PA-2(CNCL)'
   3A93 C3D35D                3297
   3A96 6BD7C160F3404040 3AA0 3298         DC    CL11',PA-3      '
   3A9E 404040                3298
   3AA1 6DC3D3C5C1D94040 3AAB 3299         DC    CL11'_CLEAR     '
   3AA9 404040                3299
                         3AAC 3300 SKTOSP EQU   *
   3AAC 7EE2C5D340D7C5D5 3AB6 3301         DC    CL11'=SEL PEN   '
   3AB4 404040                3301
   3AB7 E6C3C1D9C440D9C4 3AC1 3302         DC    CL11'WCARD RDR  '
   3ABF D94040                3302
   3AC2 60D5D640C1C9C440 3ACC 3303         DC    CL11'-NO AID    '
   3ACA 404040                3303
   3ACD 40E4D5D2D5D6E6D5 3AD7 3304         DC    CL11' UNKNOWN   '      END OF TABLE - - - - -
   3AD5 404040                3304
   3AD8 0000             3AD9 3305 COUNT  DC    XL2'0'                 DELAY COUNT HOLDER
   3ADA 0002             3ADB 3306 TWO    DC    IL2'2'                 CONSTANT TWO
   3ADC 0240DDAA         3ADF 3307 AIDEX1 DC    XL4'0240DDAA'          DEVICE (DD) AND AID (AA) FILLED IN
   3AE0 40401140C1       3AE4 3308         DC    XL5'40401140C1'
   3AE5 40C4C5D7D9C5E2E2 3AEC 3309         DC    CL8' DEPRESS'
   3AED 03               3AED 3310 AIDEX2 DC    XL1'03'                ETX
   3AEE C9D5C3D6D9D9C5C3 3B0E 3311 INCORP DC    CL33'INCORRECT RESULTS FROM          '
   3AF6 E340D9C5E2E4D3E3      3311
   3AFF E240C6D9D6D44040      3311
   3B06 4040404040404040      3311
   3B0E 40                    3311
                         3B0F 3312 RT&P   EQU   *                      ROUTINE 6 WRITE PATTERN
   3B0F 0227F540         3B12 3313         DC    XL4'0227F540'          STX,ESC,ER/WR,MCC
   3B13 5C5C5C5CC4C5E5C9 3B1F 3314 RT6DV  DC    CL13'****DEVICE XX'
   3B1B C3C540E7E7            3314
   3B20 1D60             3B21 3315         DC    XL2'1D60'              SF, PROT
   3B22 D7F1             3B23 3316         DC    CL2'P1'
   3B24 1D40             3B25 3317         DC    XL2'1D40'              SF, UNPROT
   3B26 E4F1             3B27 3318         DC    CL2'U1'
   3B28 1D60             3B29 3319         DC    XL2'1D60'              SF, PROT
   3B2A D7F2             3B2B 3320         DC    CL2'P2'
   3B2C 1D40             3B2D 3321         DC    XL2'1D40'              SF, UNPROT
   3B2E E4F2             3B2F 3322         DC    CL2'U2'
   3B30 1D60             3B31 3323         DC    XL2'1D60'              SF, PROT
   3B32 D7F3             3B33 3324         DC    CL2'P3'
   3B34 1D40             3B35 3325         DC    XL2'1D40'              SF, UNPROT
   3B36 E4F3             3B37 3326         DC    CL2'U3'
   3B38 1D60             3B39 3327         DC    XL2'1D60'              SF, PROT
   3B3A D7F4             3B3B 3328         DC    CL2'P4'
   3B3C 1D40             3B3D 3329         DC    XL2'1D40'              SF, UNPROT
   3B3E E4F4             3B3F 3330         DC    CL2'U4'
   3B40 1D60             3B41 3331         DC    XL2'1D60'              SF, PROT
   3B42 D7F5             3B43 3332         DC    CL2'P5'
   3B44 1D40             3B45 3333         DC    XL2'1D40'              SF, UNPROT
   3B46 E4F5             3B47 3334         DC    CL2'U5'
   3B48 1D60             3B49 3335         DC    XL2'1D60'              SF, PROT
   3B4A D7F6             3B4B 3336         DC    CL2'P6'
   3B4C 1D40             3B4D 3337         DC    XL2'1D40'              SF, UNPROT
   3B4E E4F6             3B4F 3338         DC    CL2'U6'
   3B50 1D60             3B51 3339         DC    XL2'1D60'              SF, PROT
   3B52 D7F7             3B53 3340         DC    CL2'P7'
   3B54 1D40             3B55 3341         DC    XL2'1D40'              SF, UNPROT
   3B56 E4F7             3B57 3342         DC    CL2'U7'
   3B58 1D60             3B59 3343         DC    XL2'1D60'              SF, PROT
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3B5A D7F8             3B5B 3344         DC    CL2'P8'
   3B5C 1D40             3B5D 3345         DC    XL2'1D40'          SF, UNPROT
   3B5E E4F8             3B5F 3346         DC    CL2'U8'
   3B60 0005             3B61 3347         DC    XL2'05'            PT, SHOULD GO TO ADDR 0
   3B62 03               3B62 3348 RT6PE   DC    XL1'03'            ETX
                         3B63 3349
                         3B63 3350 RT6T    EQU   *                  ROUTINE 6 TEST SEQUENCE
   3B63 0227F140         3B66 3351         DC    XL4'0227F140'      STX,ESC,WRITE,WCC
   3B67 05               3B67 3352         DC    XL1'05'            PT (PROGRAM TAB)
   3B68 1305             3B69 3353         DC    XL2'1305'          INSERT CURSOR AND PT
   3B6A 3C40D8D9         3B6D 3354         DC    XL4'3C40D8D9'      RA AND INSERT AN 'R'
   3B6E 05               3B6E 3355         DC    XL1'05'            PT
   3B6F 1140E3           3B71 3356         DC    XL3'1140E3'        SBA
   3B72 0505             3B73 3357         DC    XL2'0505'          PT TWICE
   3B74 D4               3B74 3358         DC    CL1'M'             INSERT AN 'M'
   3B75 05               3B75 3359         DC    XL1'05'            PT
   3B76 12407C           3B78 3360         DC    XL3'12407C'        ERASE UNPROT TO ADDR
   3B79 C5               3B79 3361         DC    CL1'E'             INSERT AN 'E'
   3B7A 1240C3           3B7C 3362         DC    XL3'1240C3'        EUA TO ADDR 4
   3B7D 11407D           3B7F 3363         DC    XL3'11407D'        SBA
   3B80 3C40C260         3B83 3364         DC    XL4'3C40C260'      REPEAT A '-' TO ADDR 3
   3B84 114040           3B86 3365         DC    XL3'114040'        RESET BUFFER ADDRESS
   3B87 03               3B87 3366 RT6TE   DC    XL1'03'            ETX
                         3B87 3367
                         3B88 3368 R6EXP   EQU   *                  EXPECTED RESULT FOR RTN 6
   3B88 6060             3B89 3369         DC    CL2'--'
   3B8A 00               3B8A 3370         DC    XL1'0'
   3B8B 5CC4C5E5C9C3C540 3B94 3371 R6EDV   DC    CL10'*DEVICE XX'
   3B93 E7E7             3B71 3371
   3B95 1D60             3B96 3372         DC    XL2'1D60'
   3B97 D7F1             3B98 3373         DC    CL2'P1'
   3B99 1D40             3B9A 3374         DC    XL2'1D40'
   3B9B E4F1             3B9C 3375         DC    CL2'U1'
   3B9D 1D60             3B9E 3376         DC    XL2'1D60'
   3B9F D7F2             3BA0 3377         DC    CL2'P2'
   3BA1 1D40             3BA2 3378         DC    XL2'1D40'
   3BA3 D9F2             3BA4 3379         DC    CL2'R2'
   3BA5 1D60             3BA6 3380         DC    XL2'1D60'
   3BA7 D7F3             3BA8 3381         DC    CL2'P3'
   3BA9 1D40             3BAA 3382         DC    XL2'1D40'
   3BAB E4F3             3BAC 3383         DC    CL2'U3'
   3BAD 1D60             3BAE 3384         DC    XL2'1D60'
   3BAF D7F4             3BB0 3385         DC    CL2'P4'
   3BB1 1D40             3BB2 3386         DC    XL2'1D40'
   3BB3 E4F4             3BB4 3387         DC    CL2'U4'
   3BB5 1D60             3BB6 3388         DC    XL2'1D60'
   3BB7 D7F5             3BB8 3389         DC    CL2'P5'
   3BB9 1D40             3BBA 3390         DC    XL2'1D40'
   3BBB E4F5             3BBC 3391         DC    CL2'U5'
   3BBD 1D60             3BBE 3392         DC    XL2'1D60'
   3BBF D7F6             3BC0 3393         DC    CL2'P6'
   3BC1 1D40             3BC2 3394         DC    XL2'1D40'
   3BC3 D4               3BC3 3395         DC    CL1'M'
   3BC4 001D60           3BC6 3396         DC    XL3'001D60'
   3BC7 D7F7             3BC8 3397         DC    CL2'P7'
   3BC9 1D40000001D60    3BCE 3398         DC    XL6'1D40000001D60'
   3BCF D7F8             3BD0 3399         DC    CL2'P8'
   3BD1 1D4000           3BD3 3400         DC    XL3'1D4000'
   3BD4 C56060           3BD6 3401         DC    CL3'E--'
   3BD7 FE               3BD7 3402         DC    XL1'FE'            SWITCH TO SINGLE CHARACTER '-'
                         3BD8 3403 R6EXP2  EQU   *
   3BD8 00000000000000000 3BE4 3404        DC    13XL1'00'
   3BE0 0000000000       3404
   3BE5 1D60             3BE6 3405         DC    XL2'1D60'
   3BE7 D7F1             3BE8 3406         DC    CL2'P1'
   3BE9 1D400000         3BEC 3407         DC    XL4'1D400000'
   3BED 1D60             3BEE 3408         DC    XL2'1D60'
   3BEF D7F2             3BF0 3409         DC    CL2'P2'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3BF1 1D400000         3BF4 3410         DC    XL4'1D400000'
   3BF5 1D60             3BF6 3411         DC    XL2'1D60'
   3BF7 D7F3             3BF8 3412         DC    CL2'P3'
   3BF9 1D400000         3BFC 3413         DC    XL4'1D400000'
   3BFD 1D60             3BFE 3414         DC    XL2'1D60'
   3BFF D7F4             3C00 3415         DC    CL2'P4'
   3C01 1D400000         3C04 3416         DC    XL4'1D400000'
   3C05 1D60             3C06 3417         DC    XL2'1D60'
   3C07 D7F5             3C08 3418         DC    CL2'P5'
   3C09 1D400000         3C0C 3419         DC    XL4'1D400000'
   3C0D 1D60             3C0E 3420         DC    XL2'1D60'
   3C0F D7F6             3C10 3421         DC    CL2'P6'
   3C11 1D400000         3C14 3422         DC    XL4'1D400000'
   3C15 1D60             3C16 3423         DC    XL2'1D60'
   3C17 D7F7             3C18 3424         DC    CL2'P7'
   3C19 1D400000         3C1C 3425         DC    XL4'1D400000'
   3C1D 1D60             3C1E 3426         DC    XL2'1D60'
   3C1F D7F8             3C20 3427         DC    CL2'P8'
   3C21 1D40             3C22 3428         DC    XL2'1D40'
   3C23 FE               3C23 3429         DC    XL1'FE'            END OF PATTERN
                         3C24 3430 RT7P    EQU   *                  PATTERN TO TRY INVALID ADDRESS
   3C24 0227F540         3C27 3431         DC    XL4'0227F540'      STX,ESC,ER/WRT,WCC
   3C28 110000           3C2A 3432 INVADR  DC    XL3'110000'        INVALID SBA GETS FILLED IN
   3C2B 03               3C2B 3433 RT7PE   DC    XL1'03'            ETX
   3C2C C760             3C2D 3434 INVM1   DC    XL2'C760'          INVALID MODEL 1 ADDRESS
   3C2E 5E40             3C2F 3435 INVM2   DC    XL2'5E40'          INVALID MODEL 2 ADDRESS
   3C30 40C1             3C31 3436 OC      DC    XL2'40C1'          OPERATION CHECK STATUS
   3C32 0000             3C33 3437 SNSARE  DC    XL2'0'             SENSE AREA
   3C34 01FE             3C35 3438 X01FE   DC    XL2'01FE'          HEX 01FE
   3C36 1604             3C37 3439 SSN6    DC    XL2'1604'          MICRO WORD TO SET SSN6(BLOCK PARITY)
   3C38 0000             3C39 3440 BDGRTN  DC    XL2'0'             MICRO WORD TO RETURN TO WRITE LOOP
   3C3A 00               3C3A 3441 STFLG   DC    XL1'0'             FLAG TO INDICATE MICRO CODE CHANGED
                         3C3B 3442 R8P1    EQU   *                  ERASE WRITE TO CAUSE PARITY CHECK
   3C3B 0227F5C2         3C3E 3443         DC    XL4'0227F5C2'      STX,ESC,ER/WR,UNLOCK
   3C3F 003C4040F1       3C43 3444         DC    XL5'003C4040F1'    RA 0000 CHAR 1
   3C44 03               3C44 3445 R8P1E   DC    XL1'03'            ETX
                         3C45 3446 R8P2    EQU   *                  ERASE WRITE TO CAUSE PARITY CHECK
   3C45 0227F5C2         3C48 3447         DC    XL4'0227F5C2'      STX,ESC,ER/WR,UNLOCK
   3C49 F3               3C49 3448         DC    CL1'3'             CHARACTER 3
   3C4A 1DFE             3C4B 3449         DC    XL2'1DFE'          BAD PARITY ATTRIBUTE GETS PUT IN
   3C4C 3C4040F2         3C4F 3450         DC    XL4'3C4040F2'      RA 0000 CHAR 2
   3C50 03               3C50 3451 R8P2E   DC    XL1'03'            ETX
                         3C51 3452 R8P3    EQU   *                  ERASE WRITE TO CAUSE BAD PARITY
   3C51 0227F5C2         3C54 3453         DC    XL4'0227F5C2'      STX,ESC,ER/WR,UNLOCK
   3C55 F1               3C55 3454         DC    CL1'1'             BAD PARITY GETS PUT IN
   3C56 3C4040F4         3C59 3455         DC    XL4'3C4040F4'      RA 000 CHAR 4
   3C5A 03               3C5A 3456 R8P3E   DC    XL1'03'            ETX
                         3C5B 3457 R8P4    EQU   *                  SENDS ALL ONE CHARACTER
   3C5B 0227F5C2         3C5E 3458         DC    XL4'0227F5C2'      STX,ESC,ER/WR,UNLOCK
   3C5F 3C404000         3C62 3459 R8CHR   DC    XL4'3C404000'      RA, CHAR GETS FILLED IN
   3C63 03               3C63 3460 R8P4E   DC    XL1'03'            ETX
   3C64 016CD9024000     3C69 3461 R8EXP1  DC    XL6'016CD9024000'  DEVICE GETS FILLED IN
   3C6A C4C403           3C6C 3462 R8EXP2  DC    XL3'C4C403'        EXPECTED STATUS = DC US
   3C6D 3C37             3C6E 3463 ASSN6   DC    AL2(SSN6)
   3C6F 3C39             3C70 3464 ABDGRT  DC    AL2(BDGRTN)
                         3C71 3465 R11P1   EQU   *
   3C71 0227F5C2         3C74 3466         DC    XL4'0227F5C2'      STX,ESC,ER/WR,WCC - UNLOCK
   3C75 1D60             3C76 3467         DC    XL2'1D60'          SF - PROT
   3C77 C9D540D3D6E6C5D9 3C9D 3468         DC    CL39'IN LOWER CASE (ALPHA IF DATA ENTRY KDB)'
   3C7F 40C3C1E2C5404DC1       3468
   3C87 D3D7C8C140C9C640       3468
   3C8F C4C3E3C140C5D5E3       3468
   3C97 D9E840D2C4C25D         3468
   3C9E 40C3D6D7E840E3C8 3CB0  3469         DC    CL19' COPY THE FOLLOWING'
   3CA6 C540C6D6D3D3D6E6       3469
   3CAE C9D5C7                 3469
   3CB1 11C17E1DE8       3CB5  3470         DC    XL5'11C17E1DE8'    SBA, SF HI INT, PROT
   3CB6 98A68599A3A8A489 3CCF  3471 LCP     DC    XL26'98A68599A3A8A489969781A2848687889192 93A9A783A5829594'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    3CBE 969781A284868788      3471
    3CC6 919293A9A783A582      3471
    3CCE 9594                  3471
    3CD0 11C34E1D4013     3CD5 3472          DC    XL6'11C34E1D4013'      SBA, SF UNPROT, INSER CURSOR
    3CD6 11C3E91D60       3CDA 3473          DC    XL5'11C3E91D60'        SBA, SF PROT
    3CDB 11C5C1           3CDD 3474          DC    XL3'11C5C1'            SBA
    3CDE C9C640E8D6E440C8 3D04 3475          DC    CL39'IF YOU HAVE A DATA ENTRY KBD, (NUMERICS'
    3CE6 C1E5C540C140C4C1      3475
    3CEE E3C140C5D5E3D9E8      3475
    3CF6 40D2C2C446B404DD5     3475
    3CFE E4D4C5D9C9C3E2        3475
    3D05 40C1D9C540E4D7D7 3D2C 3476          DC    CL40' ARE UPPER CASE ALPHA) DEPRESS TEST REQ.'
    3D0D C5D940C3C1E2C540      3476
    3D15 C1D3D7C8C15D40C4      3476
    3D1D C5D7D9C5E2E240E3      3476
    3D25 C5E2E340D9C5D84B      3476
    3D2D 40D6E3C8C5D9E6C9 3D46 3477          DC    CL26' OTHERWISE, DEPRESS ENTER.'
    3D35 E2C56B40C4C5D7D9      3477
    3D3D C5E2E240C5D5E3C5      3477
    3D45 D94B                  3477
    3D47 03               3D47 3478 R11P1E DC    XL1'03'                ETX
                          3D48 3479 R11P2  EQU   *
    3D48 0227F5C2         3D4B 3480          DC    XL4'0227F5C2'          STX,ESC,ER/WR,WCC - UNLOCK KBD
    3D4C 1D60             3D4D 3481          DC    XL2'1D60'              SF PROT
    3D4E C9D540E4D7D7C5D9 3D6E 3482          DC    CL33'IN UPPER CASE, COPY THE FOLLOWING'
    3D56 40C3C1E2C56B40C3      3482
    3D5E D6D7E840E3C8C540      3482
    3D66 C6D6D3D3D6E6C9D5      3482
    3D6E C7                    3482
    3D6F 11C17E1DE8       3D73 3483          DC    XL5'11C17E1DE8'        SBA, SF HI INT, PROT
    3D74 D8E6C5D9E3E8E4C9 3D8D 3484 UCP      DC    CL26'QWERTYUIOPASDFGHJKLZXCVBNM'
    3D7C D6D7C1E2C4C6C7C8      3484
    3D84 D1D2D3E9E7C3E5C2      3484
    3D8C D5D4                  3484
    3D8E 11C34E1D4013     3D93 3485          DC    XL6'11C34E1D4013'      SBA, SF UNPORT, INSERT CURSOR
    3D94 11C3E91D60       3D98 3486          DC    XL5'11C3E91D60'        SBA, SF PROT
    3D99 11C5C1           3D9B 3487          DC    XL3'11C5C1'            SBA
    3D9C E3C8C5D56B40C4C5 3DAE 3488          DC    CL19'THEN, DEPRESS ENTER'
    3DA4 D7D9C5E2E240C5D5      3488
    3DAC E3C5D9                3488
    3DAF 03               3DAF 3489 R11P2E DC    XL1'03'                ETX
                          3DB0 3490 R11P3  EQU   *
    3DB0 0227F5C2         3DB3 3491          DC    XL4'0227F5C2'          STX,ESC,ER/WR, UNLOCK KBD
    3DB4 1D60             3DB5 3492          DC    XL2'1D60'              SF - PROT
    3DB6 C5D9D9D6D9E240E6 3DE8 3493          DC    CL51'ERRORS WERE DETECTED AND LOGGED OUT ON THE PRINTER.'
    3DBE C5D9C540C4C5E3C5      3493
    3DC6 C3E3C5C440C1D5C4      3493
    3DCE 40D3D6C7C7C5C440      3493
    3DD6 D6E4E340D6D540E3      3493
    3DDE C8C540D7D9C9D5E3      3493
    3DE6 C5DJ48                3493
    3DE9 11C2601DE8       3DED 3494          DC    XL5'11C2601DE8'        SBA SF PROT, HI INT
    3DEE C4C5D7D9C5E2E240 3E03 3495          DC    CL22'DEPRESS ENTER TO RETRY'
    3DF6 C5D5E3C5D940E3D6      3495
    3DFE 40D9C5E3D9E8          3495
    3E04 11C3F1           3E06 3496          DC    XL3'11C3F1'            SBA
    3E07 C4C5D7D9C5E2E240 3E2D 3497          DC    CL39'DEPRESS PA-2(CNCL) TO GO ON.  -CAUTION-'
    3E0F D7C160F24DC3D5C3      3497
    3E17 D35D40E3D640C7D6      3497
    3E1F 40D6D54B404060C3      3497
    3E27 C1E4E3C9D6D560        3497
    3E2E 40D9C5D8E4C9D9C5 3E52 3498          DC    CL37' REQUIRES LOWER SHIFT ON SOME KEYBDS.'
    3E36 E240D3D6E6C5D940      3498
    3E3E E2C8C9C6E340D6D5      3498
    3E46 40E2D6D4C540D2C5      3498
    3E4E E8C2C4E24B            3498
    3E53 03               3E53 3499 R11P3E DC    XL1'03'                ETX
                          3E54 3500 R12P   EQU   *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    3E54 0227F57F         3E57 3501          DC    XL4'0227F57F'          STX,ESC,ER/WR,WCC - DO EVERYTHING
    3E58 C5D5C440D6C640E3 3E70 3502 EJMG     DC    CL25'END OF TEST FOR DEVICE XX'
    3E60 C5E2E340C6D6D940      3502
    3E68 C4C5E5C9C3C540E7      3502
    3E70 E7                    3502
    3E71 03               3E71 3503 R12PE  DC    XL1'03'                ETX
    3E72 E6D9D6D5C740C4C1 3E92 3504 R11MG  DC    CL33'WRONG DATA RECEIVED FROM KEYBOARD'
    3E7A E3C140D9C5C3C5C9      3504
    3E82 E5C5C440C6D9D6D4      3504
    3E8A 40D2C5E8C2D6C1D9      3504
    3E92 C4                    3504
    3E93 0240DDAA         3E96 3505 R11EX1 DC    XL4'0240DDAA'          DEVICE AND AID GET FILLED IN
    3E97 C36A11C34F       3E9B 3506 R11EX2 DC    XL5'C36A11C34F'        KEEP WITH ABOVE DATA
                          3E9C 3507 R09P   EQU   *
    3E9C 0227F56A         3E9F 3508          DC    XL4'0227F56A'          STX,ESC,ER/WR,WCC
                          3EA0 3509 R09PS  EQU   *
    3EA0 E4D7D7C5D940C3C1 3EAA 3510          DC    CL11'UPPER CASE-'
    3EA8 E2C560                3510
    3EAB C1C2C3C4C5C6C7C8 3EC4 3511          DC    CL26'ABCDEFGHIJKLMNOPQRSTUVWXYZ'  UPPER CASE PATTERN
    3EB3 C9D1D2D3D4D5D6D7      3511
    3EBB D8D9E2E3E4E5E6E7      3511
    3EC3 E8E9                  3511
    3EC5 40404040D3D6E6C5 3ED3 3512          DC    CL15'    LOWER CASE-'
    3ECD D940C3C1E2C560        3512
    3ED4 8182838485868788 3EE0 3513          DC    XL13'81828384858687888991929394'  LOWER CASE PATTERN
    3EDC 8991929394            3513
    3EE1 95969798 99A2A3A4 3EED 3514 R09EXP DC    XL13'9596979899A2A3A4A5A6A7A8A9'
    3EE9 A5A6A7A8A9            3514
    3EEE 00               3EEE 3515 R09PE  DC    XL1'0'                 ETX OR HEX FE
                          3EEF 3516 AIDT6  EQU   *
    3EEF 0227F5C2         3EF2 3517          DC    XL4'0227F5C2'          STX,ESC,ER/WR,WCC
    3EF3 1D60             3EF4 3518          DC    XL2'1D60'              SF - PROT
    3EF5 E4E2C9D5C740E3C8 3F18 3519          DC    CL39'USING THE SELECTOR PEN, SELECT - FLD A '
    3EFD C540E2C5D3C5C3E3      3519
    3F05 D6D940D7C5D56B40      3519
    3F0D E2C5D3C5C3E34060      3519
    3F15 40C6D3C440C140        3519
    3F1C 5040C6D3C440C34B 3F43 3520          DC    CL40'& FLD C.  THEN SELECT ''END''.  IT SHOULD '
    3F24 4040E3C8C5D540E2      3520
    3F2C C5D3C5C3E3407DC5      3520
    3F34 D5C47D4B4040C9E3      3520
    3F3C 40E2C8D6E4D3C440      3520
    3F44 C2C540C4C5E3C5C3 3F68 3521          DC    CL40'BE DETECTED.  IF FEATURE NOT INSTALLED, '
    3F4C E3C5C44B4040C9C6      3521
    3F54 40C6C5C1E3E4D9C5      3521
    3F5C 40D5D6E340C9D5E2      3521
    3F64 E3C1D3D3C5C46B40      3521
    3F6C C4C5D7D9C5E2E240 3F7E 3522          DC    CL19'DEPRESS PA-2(CNCL).'
    3F74 D7C160F24DC3D5C3      3522
    3F7C D35D4B                3522
    3F7F 11C25F           3F81 3523          DC    XL3'11C25F'            SBA
    3F82 1DE8             3F83 3524          DC    XL2'1DE8'              SF HI INT - PROT
    3F84 11C3F0           3F86 3525          DC    XL3'11C3F0'            SBA
    3F87 1DE8             3F88 3526          DC    XL2'1DE8'              SF, HI INT PROT, DETACTABLE
    3F89 6FC6D3C440C14040 3F91 3527          DC    CL9'?FLD A   '
    3F91 40                    3527
    3F92 1DE8             3F93 3528          DC    XL2'1DE8'              SF, HI INT PROT, DETACTABLE
    3F94 6FC6D3C440C24040 3F9C 3529          DC    CL9'?FLD B   '
    3F9C 40                    3529
    3F9D 1DE8             3F9E 3530          DC    XL2'1DE8'              SF, HI INT PROT, DETECTABLE
    3F9F 6FC6D3C440C34040 3FA7 3531          DC    CL9'?FLD C   '
    3FA7 40                    3531
    3FA8 1DE8             3FA9 3532          DC    XL2'1DE8'              SF, HI INT PROT, DETECTABLE
    3FAA 6FC6D3C440C44040 3FB2 3533          DC    CL9'?FLD D   '
    3FB2 40                    3533
    3FB3 1DE8             3FB4 3534          DC    XL2'1DE8'              SF, HI INT PROT, DETECTABLE
    3FB5 40C5D5C440404040 3FBD 3535          DC    CL9' END     '
    3FBD 40                    3535
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3FBE 1DE8             3FBF 3536         DC    XL2'1DE8'           SF, HI INT PROT, DETECTABLE
   3FC0 03               3FC0 3537 AIDT6E  DC    XL1'03'             ETX
                         3FC1 3538 AIDT7   EQU   *
   3FC1 0227F1C2         3FC4 3539         DC    XL4'0227F1C2'       STX,ESC,WRITE, UNLOCK WCC
   3FC5 11C6F8           3FC7 3540         DC    XL3'11C6F8'         SBA
   3FC8 E3D9E840C1C7C1C9 3FEF 3541         DC    CL40'TRY AGAIN OR DEPRESS PA-2(CNCL) TO GO ON'
   3FD0 D540D6D940C4C5D7      3541
   3FD8 D9C5E2E240D7C160      3541
   3FE0 F24DC3D5C3D35D40      3541
   3FE8 E3D640C7D640D6D5      3541
   3FF0 03               3FF0 3542 AIDT7E  DC    XL1'03'             ETX
   3FF1 11C3F111C4C511C4 3FFA 3543 SELPEX  DC    XL10'11C3F111C4C511C4D903'  EXPECTED SEL PEN RTN.
   3FF9 D903                  3543
   3FFB 00               3FFB 3544 MICPFL  DC    XL1'0'              MICRO POL FLAG
                         3FFC 3545 MICP1   EQU   *                   MICRO POLL CONTROL SEQUENCE
   3FFC 37FF323240408F8F 4003 3546 MICP2   DC    XL8'37FF323240408F8F'
   4004 000000           4006 3547 MICPD   DC    XL3'0'              COUNT & DEVICE GO HERE
   4007 2D               4007 3548 MICP1E  DC    XL1'2D'             ENQ
                         4008 3549 NAK     EQU   *                   NAK RESPONSE
   4008 3DFF             4009 3550 NAKE    DC    XL2'3DFF'
                              3551
                         400A 3552 EAU     EQU   *                   ERASE ALL UNPROTED CMD SEQ.
   400A 02276F03         400D 3553 EAUE    DC    XL4'02276F03'       STX,ESC,EAU,ETX
   400E 0227F140110000   4014 3554 EXBUF   DC    XL7'0227F140110000' STX,ESC,WRITE,WCC,SBA
   4015 13               4015 3555         DC    XL1'13'             INSERT CURSOR
   4016                  412E 3556 EXBUFE  DS    281CL1              SAVE WRITE BUFFER WORK SPACE
   412F 0000             4130 3557 HEXADR  DC    XL2'00'             HEX ADDRESS FOR RTN 13 EXCERCISE
   4131 413B             4132 3558 RIPST   DC    AL2(EXRIP)          START OF RIPPLE DATA
   4133 0000             4134 3559 CURRIP  DC    XL2'00'             CURRENT RIPPLE DATA START
   4135 413A             4136 3560 RIPEND  DC    AL2(EXRIP-1)        END ADDR OF RIPPLE DATA
   4137 4176             4138 3561 RIPRST  DC    AL2(EXRIPE)         RESTART ADDR FOR EX.
   4139 01E0             413A 3562 EMOD1   DC    XL2'01E0'           END OF MOD 1 BUFFER
                         413B 3563 EXRIP   EQU   *                   60 CHAR RIPPLE DATA FOR RTN 13 EX.
   413B C1C2C3C4C5C6C7C8 415E 3564         DC    CL36'ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789'
   4143 C9D1D2D3D4D5D6D7      3564
   414B D8D9E2E3E4E5E6E7      3564
   4153 E8E9F0F1F2F3F4F5      3564
   415B F6F7F8F9              3564
   415F 5060617A4B5B6B7B 4176 3565 EXRIPE  DC    CL24'&-/:.$,#<%@()+;>=|¬?"*'' '
   4167 4C6C7C4D5D4E5E6E      3565
   416F 7E4F5F6F7F5C7D40      3565
   4177 FF               4177 3566         DC    XL1'FF'             END OF EX. DATA
   4178 0780             4179 3567 EMOD2   DC    XL2'0780'           END OF MOD 2 BUFFER
   417A 0000             417B 3568 EADR    DC    XL2'0'              END ADDR IN USE (MOD 1 OR 2)
   417C 01E8             417D 3569 MOD1L   DC    IL2'488'            LENGTH OF MOD 1 WRITE PATTERN
   417E 0788             417F 3570 MOD2L   DC    IL2'1928'           LENGTH OF MOD 2 WRITE PATTERN
   4180 E0AA             4181 3571 KATD1   DC    XL2'E0AA'           REPLACEMENT KATAKANA CHAR.
   4182 8A9A             4183 3572 KATD2   DC    XL2'8A9A'
                              3573
   4200                       3574         ORG   *,256,0             ORG TO 256 BOUNDARY
                         4200 3575 XMITRC  EQU   *                   TRANSMIT & RECEIVE FIELD
   4200                  431F 3576 XMITE   DS    288CL1
   4320 FF               4320 3577 FILL    DC    XL1'FF'             FILL CHARACTER
   4321                  49FF 3578         DS    1739CL1             SPACE FOR RTN 13 EXCERCISE
                              3579         TREP
                              3580         TREP
                              3581         TREP
                              3582         TREP
                              3583         TREP
                              3584         TREP
                              3585         TREP
                              3586         TREP
                              3587         TREP
                              3588         TREP
                              3589         TREP
                              3590         TREP
                              3591         TREP
                              3592         TREP
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              3593         TREP
                              3594         TREP
                              3595         TREP
                              3596         TREP
                              3597         TREP
                              3598         TREP
                              3599         TREP
                              3600         TREP
                              3601         TREP
                              3602         TREP
                              3603         TREP
                              3604         TREP
                              3605         TREP
                              3606         TREP
                              3607         TREP
                              3608         TREP
                         0A11 3609         END   START
```

8943 DA FUNCTIONAL TESTS

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ABDGRT	A	002	3C70	3464	1564
ACCIN	C	001	0013	0069	0643 2270
ACCINM	A	019	298E	2586	2272
ACK	A	002	2FFB	2662	0421* 0431 0432* 0434* 0581* 1698 1914* 1917 1924 1924 1926 1929 1930* 1952 1953* 1955* 1956 1960 1960 1962 2104* 2106* 2116
ACK0	A	002	263D	2530	1752
ACK1	A	002	263F	2531	0362 0374 1668 1668 1670 1676 1914
ADDOK	A	004	19C4	1509	1500
AGAIN	A	003	1F65	1972	1983
AID	A	001	2659	2543	1250 1253 1266 1270 1274 1285 1292 1294 1315 1317 1343 1345 1738* 2185
AIDEX1	A	004	3ADF	3307	1056* 1057* 1069* 1070* 1103 1107 1109 1150 1175* 1183
AIDEX2	A	001	3AED	3310	1071 1188 1190 1205
AIDFND	A	005	14A5	1094	1090
AIDLP	A	004	14F4	1120	1198 1214 1220
AIDM	A	020	391F	3258	1170*
AIDOK	A	006	1520	1135	1085 1201
AIDPOL	A	004	145C	1074	1082 1124 1129 1131
AIDRC	A	029	3944	3263	1094*
AIDTAB	A	001	39E6	3280	1066 1088
AIDT1	A	001	3847	3240	1061
AIDT1E	A	001	3902	3253	1061 1063
AIDT2	A	001	3905	3255	1194
AIDT2E	A	001	3920	3259	1194 1196
AIDT3	A	001	3921	3260	1115
AIDT3E	A	001	3978	3266	1115 1117
AIDT4	A	001	3979	3267	1156
AIDT4E	A	001	3984	3271	1156 1158
AIDT5	A	001	3985	3272	1145
AIDT5E	A	001	39D6	3277	1145 1147
AIDT6	A	001	3EEF	3516	1210
AIDT6E	A	001	3FC0	3537	1210 1212
AIDT7	A	001	3FC1	3538	1217
AIDT7E	A	001	3FF0	3542	1217 1219
AINT2	A	002	2616	2508	1552
ARR	C	001	0008	0019	1301 1329 1446 1482 1531 1558 1563 1592 1666 1685 1714 1745 1759 1786 1790 1829 1851 1970 1989 1996 2003 2012 2077 2107 2130 2214 2229 2412
ASSN6	A	002	3C6E	3463	1559
ATNR	C	001	000A	0071	1656 2258
ATTCH	C	001	0005	0077	1586 2243 2451
ATTCHK	C	001	005D	0015	0153 1571 1576 2429
ATTMSG	A	016	28E4	2575	2245
ATTNOR	A	017	2895	2569	2260
AVAIL	A	006	0C0C	0268	0318
AVALMG	A	010	2B19	2601	0272
A1	A	004	31AE	2712	0872 0906 0923 0924 0972 0997 1025 1518*
A1A	A	004	3291	2735	0872*
A2	A	004	3378	2802	0906*
A3	A	004	341A	2897	0923*
A4	A	004	34F2	3031	0924*
A5	A	004	35AF	3075	0972*
A6	A	004	36C7	3162	0997*
A7	A	004	37BC	3214	1025*
BADST	A	004	0FBA	0640	0635
BCNT	A	002	2612	2506	0150* 0151* 0154* 1616* 1645*
BDGRTN	A	002	3C39	3440	1575* 3464
BDST	C	001	0015	0081	0640 0680 0852 2145 2276 2339
BLKDN	A	004	1F95	1986	1973
BSYERR	A	004	1BA2	1651	1646
BUSE	C	001	0002	0070	1651 2234
BUSY	C	001	008A	0030	1628
BUSYB	A	004	1B4C	1628	1649 1660
CAR	C	001	008C	0026	1621* 1629
CC	A	002	2645	2534	
CHAID	A	004	148F	1088	1203

8943 DA FUNCTIONAL TESTS

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
CHECK	A	004	1EEA	1934	1998 2000
CHECK1	A	004	1F9D	1989	0547 1913 1950 1963
CHECK2	A	004	1FB9	1996	1928
CHKIT	A	004	20D8	2084	2096
CHKPS	A	006	223F	2196	2192
CHKST	A	004	0C8E	0317	0267
CHMODX	A	004	24EA	2412	0866 0895 0928 0937 0961 0985 1014 1046 1234
CH1RT	A	004	1FB5	1994	1989*
CH2RT	A	004	1FD1	2001	1996*
CLSET	A	004	0AC3	0169	0167 0168
CNTLP	A	006	2289	2219	2222
CNTRL	C	001	0088	0034	0784 0822 1551 1583 1619 2443
CONADR	A	002	18AD	1431	1447* 1448* 1449* 1456* 1458 1475
CONDE	A	006	16BD	1266	1263
CONFLG	A	001	2660	2547	0390* 1484* 1538
CONPOL	A	004	21EA	2168	2165
CONS	A	002	0B20	0195	0173
CONVER	A	004	18E1	1446	1413
CONVR	A	004	1955	1476	1446*
CORD	A	003	0B8D	0230	0227
COUNT	A	002	3AD9	3305	2217* 2221*
CTRSTG	C	001	0058	0036	1569 1574* 1575
CURACK	A	002	265D	2545	
CURAID	A	002	3904	3254	1055* 1067* 1076 1149 1172*
CURDAT	A	002	2EEF	2643	1905* 1971 1986*
CURDEV	A	002	2605	2493	0163* 0276* 0541 0710 0768 0817 1056 1069 1248 1485* 1488* 1489* 1490 1491 1493* 1494* 1501 1515 1716 1747 1861 2131 2415
CURRIP	A	002	4134	3559	1393* 1433* 1434 1436* 1881
DATER	C	001	0008	0073	2014 2252 2328
DATIN	A	004	1B2A	1616	1609
DB	A	002	2647	2535	
DCUS	A	002	2649	2536	0677 0679
DE	A	002	2643	2533	0844 0847 2143 2146 2202
DELAY	A	004	2272	2214	0594 0672 0776
DELAYR	A	004	22A3	2224	2214* 2216 2218*
DEVHB	C	001	0009	0074	2151 2255
DEVHC	A	002	0B4C	0212	0210* 0251 0253*
DEVHLT	A	004	0B47	0211	0254 0259
DEVICE	A	009	25CF	2475	0268 0351 0353 0416 0525 0568 0569 1363 1516 1517 1518 1596 1787 1791
DEVINC	A	002	2633	2525	1485
DEVMG	A	009	2B0F	2600	0268*
DEVOK	A	004	19B0	1505	1502
DEVP	A	006	1223	0877	0874
DEVRT2	A	009	2D6E	2629	0351* 1902
DEVRT3	A	014	30AD	2676	0416*
DEVRT5	A	009	3828	3234	0525*
DISABL	A	003	1A60	1566	1561
DISP	A	005	213D	2116	2109 2111
DISPLY	A	007	380A	3225	0355
DM2	A	006	12CB	0934	0926
DOACK	A	004	1EAC	1915	1932
DOACKX	A	006	1F33	1956	1954
DOACK1	A	006	1EA6	1914	1931
DOK	A	004	0B97	0233	0224 0229
DONE	A	001	260F	2504	0164* 0262 0279* 0310 1503*
DONXT	A	004	0BF6	0261	0198 0215 0274 0321
DOPOL	A	004	1C39	1714	0265 0631 0674 1074 1302 1763 2138 2168 2201
DOPOLR	A	004	1C96	1740	1714* 1728 1733 1737
DOSIO	A	004	1AB4	1592	0357 0424 0498 0526 0532 0571 0577 0589 0624 0667 0685 0690 0756 0771 0807 0824 0834 1060 1114 1120 1144 1155 1164 1193 1209 1216 1243 1279 1310 1337 1365 1370 1417 1667 1720 1748 1908 1923 1959 2158 2173 2178
DOSIOR	A	004	1B81	1641	1592* 1594 1639*
DROPED	A	004	1BAA	1654	1624
DVBCNT	A	002	2614	2507	2133 2133* 2135* 2136 2162 2162* 2163* 2166 2196 2196* 2204* 2205

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
DVBMSG	A	014	294A	2582	2257
DVHB	A	004	2185	2151	2137
D1TO9	A	003	192D	1465	1462
EADR	A	002	417B	3568	1400* 1405* 1438
EAU	A	001	400A	3552	0590
EAUE	A	004	400D	3553	0590 0592
EAUMG	A	027	2A8C	2595	2335
EFOR3	A	001	34C1	2996	
EJMG	A	025	3E70	3502	1363*
ELIN	A	002	2FF7	2660	2092
EMOD1	A	002	413A	3562	1405
EMOD2	A	002	4179	3567	1400
ENABL	A	003	1A9F	1581	1579
ENABLE	C	001	00C0	0033	0822 1551 1583
ENDP	A	002	2FF5	2659	2065
ENDRT	A	004	17FA	1376	1375
ENINTR	C	001	0002	0032	1619 1626
ENQ	A	001	25FB	2485	1075 1254 1721 1723 1749 1751
EORD1	A	001	3182	2717	0880 0882
EORD1A	A	001	3295	2738	0884 0886
EORD2	A	001	337B	2804	0910 0912
EORD3	A	001	341D	2899	0947 0949
EORD4	A	001	34F5	3034	0950 0952
EORD5	A	001	35B2	3078	0976 0978
EORD6	A	001	36CE	3168	1000 1003 1005
EORD7	A	001	378F	3217	1029 1031
EOT	A	002	2637	2527	0366 0629 0670 0693 0796 0799 1123 1167 1373 1672 1677 2119 2181
EOTC	C	001	0040	0066	0368 2121 2288 2387
EOTMSG	A	010	293C	2581	2290
EOTOUT	A	004	1575	1164	1104
ERR	A	001	262A	2520	0328* 0368* 0375* 0640* 0643* 0680* 0706* 0712* 0781* 0793* 0800* 0831* 0840* 0852* 1132* 1586* 1618* 1636* 1637 1651* 1654 1656* 1659 1674* 1761* 1775* 1778* 2014* 2073 2121* 2145* 2148* 2151* 2193* 2230 2231 2234 2237 2240 2243 2246 2249 2252 2255 2258 2261 2264 2267 2270 2273 2276 2279 2282 2285 2288 2291 2294 2318 2328 2337 2339 2385 2387 2434* 2447* 2449* 2451*
ERRATC	A	004	255A	2451	2429
ERRHLT	A	002	24CD	2391	2230* 2398
ERROR	A	004	22A7	2229	0329 0369 0376 0642 0644 0681 0707 0713 0782 0794 0801 0832 0841 0853 1133 1587 1638 1652 1655 1657 1661 1678 1762 1776 1779 2015 2122 2147 2149 2152 2194
ERRORR	A	004	24E6	2402	2229*
ETEXT6	C	001	011C	3169	1000*
EWRT	A	001	25F2	2480	
EWRT2	A	004	2D72	2630	0358 0360 0373
EWRT3	A	001	30F0	2679	0425 0427
EXBUF	A	007	4016	3554	1391 1409* 1415 1425* 1475*
EXBUFE	A	001	412E	3556	1408* 1414 1424*
EXFIL	A	001	2E93	2633	2004 2004*
EXIT	A	004	1B85	1643	1628
EXP	A	008	3005	2665	2019
EXPBUF	A	001	2D73	2631	0373* 0374* 0538* 0539* 0540* 0541* 0542* 0543* 0544* 0545* 0709* 0711* 0798* 0799* 1071* 1075* 1135 1183* 1184* 1186* 1187* 1188* 1190* 1205* 1206* 1254* 1255* 1258* 1259* 1260* 1261* 1262* 1264* 1265* 1267 1287* 1288 1676* 1677* 1688 1853* 1858* 1859* 1860* 1861* 1862* 1879 1883 1887 1891 1895 1899 1902* 1903 1917* 1918* 1919 1920* 1935 1956* 1957* 1990 1992 1997 1999 2005 2005* 2031
EXPFL	A	001	2F15	2648	2039 2049
EXRIP	A	001	413B	3563	3558 3560
EXRIPE	A	024	4176	3565	0144* 1396 3561
EXSTR	A	004	1E90	1905	1882
FETCHS	A	004	1CDB	1763	0370 2123
FFFF	A	001	2FF1	2657	2051 2363 2365
FILAGN	A	005	1828	1396	1399
FILFFR	A	004	1FE5	2006	2003*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
FILL	A	001	4320	3577	1408 1410* 1414* 1424 1426* 1533* 1613 1613*
FILLFF	A	004	1FD5	2003	0372 0537 0708 1068 1174 1252 1675 1690 1852 1915 1951
FILTAB	A	004	1F5D	1970	1905 1921
FILTR	A	004	1F99	1987	1970*
FINEXP	A	004	1D3D	1794	1789
FIX	A	003	1F09	1944	1937
FIXST	A	004	1A52	1563	0683 1535
FND	A	004	0BB9	0242	0238
FORMAT	A	004	1D27	1790	0320 1767 2381
FORMRT	A	004	1DA1	1827	1786* 1790*
FXR1	A	004	1D99	1825	1794*
FXR2	A	004	1D9D	1826	1795*
GETDEV	A	004	0B29	0200	
GETPS	A	004	1CCC	1759	
GETSET	A	004	23CF	2298	2295
GETST	A	004	1CD3	1761	1755
GOACK	A	004	1BC6	1666	0548 0636 1768
GOACKR	A	004	1BF4	1680	1666* 1673
GOAGN	A	005	203A	2034	2069
GOERR	A	004	1CD7	1762	1760
GOON	A	004	2520	2432	2430
GOSETP	A	004	2074	2054	2050
GOTIT	A	004	1B8A	1659	1648
GOUNLK	A	004	21FC	2173	2170
GOUP	A	006	1965	1485	1523
HALT	C	001	0222	0022	0211 0304 0487 1544 1771 2390 2399
HBUSY	A	017	2903	2577	2236
HDTP1	A	006	2803	2564	0899* 0920* 0965* 0989* 1018*
HEAD	A	002	2402	2323	2318*
HEADA	A	034	27FD	2563	0870
HEADAD	A	002	2FD1	2656	2030* 2046 2064* 2065 2353* 2357 2372*
HEADP	A	017	2814	2565	0900* 0904 0921* 0935* 0944 0966* 0970 0990* 0994 1019* 1023
HEAD1A	A	034	2680	2552	0161
HEAD1B	A	022	26C6	2553	0325
HEAD10	A	031	2833	2566	1051
HEAD11	A	045	2860	2567	1241
HEAD12	A	036	2884	2568	1362
HEAD2	A	041	26EF	2554	0347
HEAD3	A	025	2708	2555	0413
HEAD4	A	030	2726	2556	0475
HEAD5	A	027	2741	2557	0522
HEAD6	A	037	2766	2558	0565
HEAD7	A	032	2786	2559	0616
HEAD8	A	031	27A5	2560	0659
HEAD9	A	005	27DB	2562	0752
HEXADR	A	002	4130	3557	1392 1392* 1437* 1438 1440 1440* 1447 1451
HEXAID	A	011	394F	3264	1098
HI	A	004	1D8C	1820	1812
HLTERR	A	004	24C8	2390	2075
IAR2	C	001	00A0	0021	1552*
IEXIT	A	004	2533	2438	2435 2448 2450 2452
INCOR	C	001	0010	0068	0375 0712 0800 1674 2264 2337
INCORM	A	018	297B	2585	2266
INCORP	A	033	3B0E	3311	1137* 1141
INIT	A	004	0A57	0140	0134 0138
INPN	C	001	0003	0076	2237 2434
INTFLG	A	001	2610	2505	0778 0786 1617* 1634 1647 2438*
INTPND	A	014	28F2	2576	2239
INT2	A	004	2508	2425	2444 2508
INV	A	004	0BEA	0255	0218 0228 0230 0232 0236
INVADR	A	003	3C2A	3432	0619* 0622*
INVMG	A	026	3097	2670	0258
INVM1	A	002	3C2D	3434	0619
INVM2	A	002	3C2F	3435	0622
INXR2	A	002	2609	2495	0165 0278
IO1	A	004	252F	2436	2433

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
IR	A	002	2635	2526	2197
IRDE	A	002	2641	2532	
ITBE	C	001	0006	0078	2246 2449
ITBER	A	004	2552	2449	2436
ITBMSG	A	013	28D4	2574	2248
KATD1	A	002	4181	3571	0142 0144
KATD2	A	002	4183	3572	0143
LCAR	A	002	261A	2510	1602 1621 2030 2353
LCP	A	026	3CCF	3471	1264
LINADR	A	002	2EF3	2646	2047
LINE	A	002	2607	2494	0162* 0277* 1486 1495 1499* 1505* 1506 1506* 1508 1508* 1509
LINES	A	003	0A0C	0012	0140 0195 1235
LINK	C	001	0216	0045	0303 0311 0391 0461 0510 0550 0600 0638 0701 0845 0865 0893 0898 0919 0931 0940 0959 0964 0988 1012 1017 1043 1045 1168 1231 1233 1236 1277 1289 1296 1348 1773 2167 2183 2203 2392 2418
LOAD	C	001	022A	0046	0314
LOG	A	001	2562	2457	
LOGCAR	A	010	25A8	2462	1599* 2301
LOGDEV	A	009	256A	2458	1517* 1596*
LOGMSG	A	001	2590	2459	1595* 1597* 2233* 2236* 2239* 2242* 2245* 2248* 2251* 2254* 2257* 2260* 2263* 2266* 2269* 2272* 2275* 2278* 2281* 2284* 2287* 2290* 2293* 2296*
LOGSAR	A	010	25BC	2464	1601* 2311 2327
LOGST	A	013	259E	2461	1598* 2316
LOGTAR	A	010	25B2	2463	1600* 2306
LOOP	A	003	1F0C	1945	1949
LOOPR1	A	004	0A26	0127	0124
LOOP13	A	004	1871	1412	1439 1442
LOZER	A	003	1939	1469	1460
LSAR	A	002	261E	2512	1605* 1623
LTAR	A	002	261C	2511	1602* 1603* 1604* 1622 1633
L16	C	001	0072	3106	0999 0999*
L26	C	001	00AA	3170	1000
MICLP	A	004	0A8D	0152	0155
MICNL	A	004	0CAD	0328	0149 0153
MICNLM	A	021	29C4	2589	2263
MICPD	A	003	4006	3547	0768* 0769* 0806*
MICPFL	A	001	3FFB	3544	0767* 0775* 0803 0805* 0823* 1532* 1643
MICP1	A	001	3FFC	3545	0772 0808
MICP1E	A	001	4007	3548	0772 0774 0798 0808 0810
MICP2	A	008	4003	3546	0816
MICRON	A	003	1A36	1551	1548
MIDDR6	A	001	3625	3105	0999 3170
MISCOM	A	004	1FF4	2015	
MISDAT	A	015	2912	2578	2254
MNL	C	001	000F	0085	0328 2261
MODIFY	A	004	1A84	1574	1559* 1564*
MODMG1	A	034	37E7	3221	0353*
MODMG2	A	013	37F4	3222	0354* 0385*
MODMG3	A	008	37FC	3223	0355* 0389 0393*
MODST	A	004	1A41	1558	0663
MODSTR	A	004	1AA8	1584	1558* 1563*
MODXR	A	004	2504	2419	2412* 2414 2416
MOD1	A	004	0D43	0386	0383
MOD1L	A	002	417D	3569	1406
MOD2L	A	002	417F	3570	1401
MOR6	A	001	366C	3129	
MOVE	A	004	1F7F	1980	1977 1985
MPCS	C	001	0017	0083	0831 2282
MPINT	C	001	0016	0082	0781 2279
MPMG1	A	036	29E8	2590	2281
MPMG2	A	051	2A1B	2591	0792
MPMG3	A	043	2A46	2592	0851
MPMG4	A	020	2A5A	2593	2284
MPMG5	A	023	2A7!	2594	2287
MSGBLK	A	001	2591	2460	1595 2322

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
MVCHR	A	004	1C10	1692	1697
MVDATA	A	005	1B25	1615	1610* 1611* 1612*
MVXR1	A	004	1C2D	1699	1686* 1696
MVXR2	A	004	1C31	1700	1687*
NAK	A	001	4008	3549	0835
NAKE	A	002	4009	3550	0835 0837
NEWAID	A	005	1583	1170	1163
NEXT	A	004	0ADB	0175	0190
NEXTB	A	006	1D68	1809	1805
NOAID	A	001	3098	2671	0352* 0394* 0540 1860
NOEOT	C	001	0014	0080	0706 2273
NOERR	A	008	2B06	2599	1597
NOINT	C	001	0007	0079	0793 1636 2249
NOINTR	A	012	28C7	2573	2251
NOKAT	A	003	0A71	0145	0141
NOP	A	006	248E	2371	2366
NOPA2	A	004	14E2	1113	1102 1106
NOPRTN	A	006	208E	2064	2052
NORAID	A	006	15CE	1190	1182
NORDUC	C	001	0088	0035	2432
NORDY	A	003	1A30	1549	1547
NOTAVL	A	020	28BB	2572	
NOTD5	A	004	0BC7	0246	0244
NOTEOT	A	004	1077	0706	0671
NOTRDY	C	001	0058	0014	1547 1624
NOT8F	A	006	0BD1	0249	0247
NULL	A	001	2EEC	2641	1901
NULLS	A	004	1E7E	1901	1865
NXTAID	A	003	156C	1161	1152
NXTKEY	A	004	155A	1154	1110 1112 1136
NXTMPT	A	006	1135	0796	0787 0811
OC	A	002	3C31	3436	0634 0641
OHOH	A	004	1D08	1778	0633 1765 2120
OK	A	004	0A3D	0133	0130
ONE	A	003	262D	2521	0154 0191 0239 0449 1398 1433 1437 1570 1604 1645 1916 2135 2163 2204 2221 2522
ONFLG	A	004	260D	2501	0171 0171* 0172* 0180* 0209 0209* 0242 2495
OOPS1	A	004	1518	1132	1127 1323
OOPS2	A	003	1502	1126	1078
OOPS3	A	004	2237	2193	2199
OOPS4	A	004	1AAC	1586	1571 1576
OOPS5	A	004	107F	0708	0676
OPT3	C	001	0008	0037	
OPT4	C	001	0010	0038	
OPT5	C	001	0020	0039	
ORD1	A	001	30F6	2682	0880
ORD1A	A	001	31B3	2718	0884
ORD2	A	001	3296	2740	0910
ORD3	A	001	337C	2805	0947
ORD4	A	001	341E	2900	0950
ORD5	A	001	34F6	3035	0976
ORD6	A	001	35B3	3079	1003 3106 3169
ORD7	A	001	36CF	3171	1029
PASS1	A	001	2629	2519	0128* 0131* 0133 0208* 0280 0281*
PAT1	A	004	1E59	1891	1871
PAT2	A	004	1E3B	1883	1875
PBUF	A	001	2EF2	2645	
PBUFBL	A	001	2F3A	2651	2016
PEXPST	A	004	1D14	1786	2341
PFLG	A	001	2627	2517	
PHD	A	004	12E9	0941	0933
PHEAD	A	036	2FCF	2655	2025 2347
PHEADA	A	038	2FAB	2654	2348
PHMSG	A	004	24D2	2394	2386 2388
PLENG	A	002	188A	1418	1401* 1406*
PLINBL	A	001	2F85	2653	2017 2080

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CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
PLINE	A	001	2F84	2652	2017* 2018* 2019* 2020* 2024 2025* 2029 2034* 2035* 2038 2042 2058 2059* 2063 2080* 2081* 2082 2083 2347* 2348* 2352 2358 2362 2363 2365 2370 2660
POLFLG	A	001	2658	2542	0266 0632 0675 1077 1079 1081 1256 1272 1276 1303 1305 1307 1727* 1732* 1736* 1739* 1764 2139 2169 2171 2182 2189
POLL	A	002	2651	2539	0542 1715 2132
POLL1	A	004	0C01	0265	
POLPR	A	006	2174	2135	2142
POLST	A	002	2658	2544	0317 0634 0677 0843* 0844 1128 1130 1321 1717 1717* 1731* 1793 2197 2202
PORD1	A	002	1232	0882	0875
PORD1A	A	002	1238	0886	0877
PORD2	A	002	1282	0912	0907
PORD3	A	002	12FA	0949	0932
PORD4	A	002	1300	0952	0934
PORD5	A	002	134A	0978	0973
PORD6	A	002	139C	1005	0998
PORD7	A	002	13E6	1031	1026
POUT	A	001	20A7	2070	2066
PP	A	004	2088	2077	2054
PPR	A	004	210D	2099	2077*
PPXR1	A	004	2105	2097	2078* 2093
PPXR2	A	004	2109	2098	2079*
PRINLN	A	006	2080	2059	2053
PRINT	C	001	021A	0023	0158 0200 0204 0255 0269 0284 0289 0293 0297 0312 0322 0344 0386 0410 0472 0479 0483 0519 0562 0613 0656 0749 0789 0848 0867 0901 0941 0967 0991 1020 1048 1138 1238 1330 1359 1540 1769 1823 1830 2021 2026 2055 2060 2071 2319 2324 2332 2343 2349 2367 2376 2382 2394
PRINTR	A	007	3803	3224	0393
PRTN	A	001	0A03	0008	1376* 1536
PRIMG	A	004	0CA1	0322	0136
PSDEV	A	002	25FA	2484	1716* 1747* 2131*
PSR	C	C01	0004	0020	2427 2428* 2441*
PSROUR	A	004	1D87	1835	1829*
PSROUT	A	004	1DA5	1829	1797 1807
PSRW	A	002	2618	2509	2427* 2441
PSTAT	A	004	1CE6	1767	
PUTP	A	003	20E8	2089	2085
PWACK	A	004	1CFD	1775	1757
PXRC	A	004	2486	2367	2364
PXREX	A	006	1FF8	2016	2013 2331 2336 2338
PXREXA	A	004	1FE9	2012	1142 1335
PXRM	A	004	243A	2343	2340
PXRNL	A	G04	2462	2355	2374
PXRRT	A	004	2080	2074	2012*
RAP	A	004	1E68	1895	1869
RBEX1	A	004	2E98	2635	0539 1859
RBFLG	A	001	2E94	2634	1857* 1864 1866 1868 1870 1872 1874 1876 2330
RDB	A	001	2600	2490	1909
RDBE	A	004	2603	2491	1853 1909 1911
RDBXR1	A	004	1F4B	1965	1854*
RDBXR2	A	004	1F4F	1966	1855*
RDERR	A	004	1FF0	2014	1939 1991 1993
RDMOD	A	001	25FC	2487	0533
RDMODE	A	004	25FF	2488	0533 0535 0538
READBF	A	004	1D8B	1851	0378 0457 0506 0584 0596 0763 1429
READBR	A	004	1F59	1968	1851* 1856 1967*
READ2	A	004	002D	0378	0363 0397
READ3	A	004	0E0A	0457	0453 0455
RECD	A	008	300D	2666	2018
RECFL	A	001	2F39	2650	2016* 2043 2049 2051 2059 2081
RESTFL	A	001	260E	2503	0121 0135 0309* 1377*
REST2	A	004	1B7D	1640	1593*
RINXR2	A	004	1950	1483	0165* 0278* 1498* 1519*
RIPDAT	A	001	2E99	2636	1898

8943 DA FUNCTIONAL TESTS

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RIPDT	A	028	2EEA	2639	0142* 0143* 0417
RIPEND	A	002	4136	3560	1434
RIPHD	A	001	2EAA	2637	0420*
RIPPLE	A	004	1E73	1898	1867
RIPRST	A	002	4138	3561	1436
RIPST	A	002	4132	3558	1393 1880
RNST	C	001	0018	0084	0840 2285
RPTCH	A	001	3812	3228	0477* 0491* 0505
RSBEOT	A	016	299E	2587	2275
RSTHMG	A	033	2D61	2626	2397
RTNFLG	A	001	2FFD	2664	0349* 0384* 0392* 0438 0452 0620 0873 0892 0918 0925 0958 1011 1042 1230 1402 2108 2191
RTNOA	A	001	11F0	0860	0747
RTNOB	A	001	1239	0888	0862
RTNOC	A	001	1283	0914	0890
RTNOD	A	001	1301	0954	0916
RTNOE	A	001	134B	0980	0956
RTNOF	A	001	139D	1007	0982
RTNO1	A	001	0A0D	0117	0010
RTNO2	A	001	0C85	0340	0119
RTNO3	A	001	0D6D	0406	0342
RTNO4	A	001	0E15	0468	0408
RTNO5	A	001	0E86	0515	0470
RTNO6	A	001	0EFA	0558	0517
RTNO7	A	001	0F64	0609	0560
RTNO8	A	001	0FD0	0652	0611
RTNO9	A	001	10AF	0745	0654
RTN10	A	001	13E7	1038	1009
RTN11	A	001	1629	1226	1040
RTN12	A	001	17C4	1354	1228
RTN13	A	001	1806	1386	1356
RT1MLT	A	004	0C6A	0304	0302
RT1MG	A	030	2D40	2625	0300
RT1MG1	A	038	2C5A	2619	0287
RT1MG2	A	030	2CAA	2621	0292
RT1MG3	A	022	2CF1	2623	0296
RT3CW	A	004	309D	2674	0418* 0419* 0435* 0436 0445* 0448*
RT3HD	A	002	30AF	2677	0420
RT6DV	A	013	3B1F	3314	0568*
RT6P	A	001	3B0F	3312	0572
RT6PE	A	001	3B62	3348	0572 0574
RT6T	A	001	3B63	3350	0578
RT6TE	A	001	3B87	3366	0578 0580
RT7P	A	001	3C24	3430	0625
RT7PE	A	001	3C28	3433	0625 0627
RVI	A	002	263B	2529	1754
RVIMSG	A	013	2932	2580	2269
RVIS	C	001	0020	0065	1761 2267 2385
RXR1	A	004	229F	2223	2215*
R04MG	A	024	2ACE	2597	0482
R04MG2	A	048	2AFE	2598	0486
R09EXP	A	013	3EED	3514	
R09P	A	001	3E9C	3507	0757
R09PE	A	001	3EEE	3515	0754* 0757 0759 0762*
R09PS	A	001	3EA0	3509	1888
R1OUT	A	006	0C1E	0276	0139 0263
R10ST	A	004	1429	1059	1053
R11AT	A	004	1764	1315	1308
R11B	A	004	1705	1285	
R11CB	A	004	1777	1321	1304
R11ER	A	004	1783	1329	1269 1291
R11ERR	A	004	17C0	1349	1329* 1344
R11EX1	A	004	3E96	3505	1248* 1253*
R11EX2	A	005	3E98	3506	1255 1260
R11GO1	A	004	16E7	1276	1268 1271
R11MG	A	033	3E92	3504	1333

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
R11P	A	004	1739	1302	1309 1314 1322
R11PA	A	004	17A5	1342	1273 1295 1346
R11PB	A	004	1701	1284	
R11PL	A	004	166D	1249	
R11POL	A	004	1735	1301	1249 1284 1342
R11POR	A	004	1773	1319	1301* 1306 1316
R11P1	A	001	3C71	3465	1244
R11P1E	A	001	3D47	3478	1244 1246
R11P2	A	001	3D48	3479	1280
R11P2E	A	001	3DAF	3489	1280 1282
R11P3	A	001	3D80	3490	1338
R11P3E	A	001	3E53	3499	1338 1340
R11RTN	A	004	1793	1336	
R11RT1	A	004	1655	1242	1275
R11RT2	A	004	16EF	1278	1293
R11TE	A	006	1683	1264	1257
R11UNL	A	004	1756	1310	1251 1286 1318
R12P	A	001	3E54	3500	1366
R12PE	A	001	3E71	3503	1366 1368
R13EX	A	004	1E2A	1879	1877
R3M2	A	004	0DDC	0443	0439
R3NXT	A	004	0DB1	0431	
R3PTR	A	004	0DFC	0452	0437
R3WPR	A	004	0DE3	0445	0441
R4WRT	A	001	380B	3226	0494* 0497* 0499
R4WRTE	A	005	3817	3229	0499 0501
R4WRT1	A	004	0E63	0498	0496
R5EXP	A	021	3842	3237	0543
R5WRT	A	001	381A	3231	0527
R5WRTE	A	001	3846	3239	0527 0529
R6EDV	A	010	3B94	3371	0569*
R6EXP	A	001	3B88	3368	1892
R6EXP2	A	001	3BD8	3403	1884
R7M1	A	004	0F8B	0624	0621
R8CHR	A	004	3C62	3459	0661* 0695 0697* 0700 0702*
R8EXP1	A	006	3C69	3461	0710*
R8EXP2	A	003	3C6C	3462	0711
R8FIX	A	004	102C	0683	0678
R8LOOP	A	004	0FEA	0663	0699 0704
R8P	A	006	0FFB	0668	0662* 0698* 0703*
R8P1	A	001	3C3B	3442	0716
R8P1E	A	001	3C44	3445	0716 0718
R8P2	A	001	3C45	3446	0719
R8P2E	A	001	3C50	3451	0719 0721
R8P3	A	001	3C51	3452	0722
R8P3E	A	001	3C5A	3456	0722 0724
R8P4	A	001	3C5B	3457	0686
R8P4E	A	001	3C63	3460	0686 0688
R8T1	A	002	10A2	0718	0662
R8T2	A	002	10A8	0721	0698
R8T3	A	002	10AE	0724	0703
SAR	C	001	0089	0028	1623* 1631
SAVAID	A	001	2661	2548	1266* 1347
SAVEX	A	006	1893	1424	
SBYTE0	C	001	0208	0040	0123 0301
SBYTE2	C	001	020A	0041	0125 0137 0197 0306* 0476 1044 1052 1232 2164
SBYTE3	C	001	020B	0042	
SBYTE4	C	001	020C	0043	0446 0495 0864 0894 0896 0897 0927 0929 0930 0936 0938 0939 0960 0962 0963 0984 0986 0987 1013 1015 1016
SBYTE5	C	001	020D	0044	2413
SCAR	A	002	2620	2513	0829 1629* 2300
SEL	A	002	2653	2540	1746
SELECR	A	004	1D10	1781	1745* 1753 1759* 1777
SELECT	A	004	1C9A	1745	0350 0396 0415 0454 0493 0504 0524 0531 0567 0588 0618 0665 0684 0755 0761 0996 1059 1100 1143 1154 1192 1208 1242 1278 1336 1364 1412 1428 2157

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SELPEN	A	006	15F9	1205	1058 1177
SELPEX	A	010	3FFA	3543	1206
SELPOL	A	001	25F3	2482	1721 1749
SENDTP	A	004	218D	2157	0876 0878 0908 0945 0974 1027
SENTPB	A	004	21C1	2158	1001
SET	A	004	0B1E	0194	0169 0169* 0170* 0180 0181 0181* 0182 0182* 0183 0183* 0184
SETEXP	A	004	18F8	1685	
SETEXR	A	004	1C35	1701	1685*
SETFL	A	003	0BD7	0250	0249*
SETFO	A	004	0B43	0210	0252
SETHIN	A	003	1933	1467	1470
SETIN	A	004	0D15	0372	0367
SETMG1	A	030	305B	2668	0203
SETMG2	A	034	307D	2669	0207
SETTBN	A	003	0ADF	0176	0192
SETUP	A	004	19F9	1531	0157 0348 0414 0492 0523 0566 0617 0660 0753 0871 0905 0922 0971 0995 1024 1047 1237 1358 1390
SETUPR	A	004	1A3D	1553	1531*
SF1	A	003	0C96	0319	1510*
SHIFT	A	004	0B03	0187	0188
SHIFTR	A	006	19B4	1506	1507
SINCHR	A	002	3819	3230	0505* 1885* 1889* 1893* 1896 1978
SIOI	C	001	0058	0016	0145 0146 0147 0152 0813 0814 1549 1550 1566 1567 1581 1582
SIONIN	A	004	1B6B	1636	
SIX	A	002	2631	2524	1639
SIXTEN	A	002	2FF3	2658	2064
SKIPTR	A	004	14DB	1111	1108
SKIP1	A	004	0C74	0308	0282 0326
SKTOSP	A	001	3AAC	3300	1054
SM2	A	004	185D	1407	1403
SNAK	A	004	11B1	0834	0830
SNSARE	A	002	3C33	3437	1569*
SNSLP	A	004	1A6C	1569	1573
SPB	A	004	0D53	0392	0365
SPFLD	A	006	25F8	2483	1715* 1746* 2132*
SPRTY	A	004	161B	1216	1151
SPXRP	A	002	37C5	3220	2373
SP6HLT	A	004	1CEE	1769	
SSAR	A	002	2624	2515	0829 1631* 2310
SSN6	A	002	3C37	3439	3463
SSTAT	A	002	2626	2516	1632* 2315
SSWFL	A	001	3099	2672	0127* 0129 0132*
SSW01	C	001	0040	0047	0123 0301
SSW10	C	001	0080	0048	0137 0197 0306
SSW11	C	001	0040	0049	0125 0306
SSW12	C	001	0020	0050	2164
SSW13	C	001	0010	0051	1052 1232
SSW14	C	001	0008	0052	1044 1232
SSW15	C	001	0004	0053	0476
SSW2F	C	001	0001	0063	
SSW20	C	001	0080	0054	0864 0894 0896 0927 0929 0936 0938 0960 0962 0984 0986 1013 1015
SSW21	C	001	0040	0055	0897
SSW22	C	001	0020	0056	0930
SSW23	C	001	0010	0057	0939
SSW24	C	001	0008	0058	0963
SSW25	C	001	0004	0059	0987
SSW26	C	001	0002	0060	1016
SSW27	C	001	0001	0061	0446 0495
SSW28	C	001	0080	0062	2413
STAID	A	005	1C8D	1738	1735
STAR	A	002	2622	2514	1630* 2305
START	A	004	0A11	0121	3609
STATBL	A	001	2C04	2616	1834
STATFL	A	001	2C03	2615	1788* 1792* 1806* 1833 1834*
STATME	A	030	2BE5	2614	1787* 1788

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
STATMS	A	030	2BC7	2613	1791* 1792
STATR	A	003	264C	2537	0838 1729 2379
STATRC	A	005	11CB	0843	0839
STATUS	C	001	0088	0029	1632
STDAT	A	002	2EF1	2644	1880* 1904* 1979* 1984
STDEV	A	002	265F	2546	0163 0276
STFLG	A	001	3C3A	3441	1534 1560* 1565* 1577 1578* 1580*
STFXR1	A	004	1E8C	1904	1886 1890 1894 1897 1900
STHLT	A	002	24E5	2400	2398*
STTAB	A	001	2B1A	2602	1802
STXRP	A	002	37C3	3219	2354
SUTR	A	006	158B	1186	1179
S2SEC	A	003	1115	0784	0779
TADD	A	004	0BA2	0237	0222* 0239* 0241
TAID	A	004	21F5	2171	
TAR	C	001	008A	0027	1622* 1630
TBIT	A	003	1D59	1804	1799* 1800* 1809 1809* 1811 1813 1814 1816* 1817* 1818 1820 1821
TCOUNT	A	001	2FFC	2663	0213* 0214 0216 0217 0219 0223 0225 0231 0235 0243 0246 0382 0422* 0440 0443 0449* 0490* 0491 1863* 1916*
TDONE	A	004	1F8D	1984	1975
TDO1	A	003	19EB	1521	1511*
TEINC	A	004	2427	2337	2329
TERM	A	004	0C84	0312	2186 2207
TERR0A	A	004	2326	2258	2256
TERR0B	A	004	2385	2291	2289
TERR0C	A	004	23C2	2294	2292
TERR0F	A	004	2333	2261	2259
TERR10	A	004	2340	2264	2262
TERR13	A	004	235A	2270	2268
TERR14	A	004	2367	2273	2271
TERR15	A	004	2374	2276	2274
TERR16	A	004	2381	2279	2277
TERR17	A	004	238E	2282	2280
TERR18	A	004	239B	2285	2283
TERR2	A	004	228E	2234	2232
TERR20	A	004	234D	2267	2265
TERR3	A	004	22CB	2237	2235
TERR4	A	004	22D8	2240	2238
TERR40	A	004	23A8	2288	2286
TERR5	A	004	22E5	2243	2241
TERR6	A	004	22F2	2246	2244
TERR7	A	004	22FF	2249	2247
TERR8	A	004	230C	2252	2250
TERR9	A	004	2319	2255	2253
TEST	C	001	0212	0025	1441 1718
TESTAG	A	004	1F1C	1950	1947
TETX	A	003	1EF2	1936	1942
THREE	A	002	262F	2523	1967
THREE2	A	002	37C1	3218	2371 2372
TLDN	A	003	1940	1471	1464 1466 1468
TLIN	A	004	0AE2	0178	0173* 0174* 0175 0175* 0176* 0186* 0187 0187* 0189 0191*
TMPCNT	A	004	1152	0803	0797
TMPDE	A	003	116F	0813	0804
TOOKBA	A	004	0FC8	0643	0630
TPARM	A	006	21CA	2159	0875* 0877* 0907* 0932* 0934* 0973* 0998* 1026*
TRDY	A	004	1A29	1547	1537 1539
TRESPR	A	004	215A	2125	2107* 2115 2117
TRESPX	A	004	211C	2107	0429 0582 2105
TRESP0	A	004	2111	2104	
TRESP1	A	004	2118	2106	0503 0530 0575 0593 0689 0760 1065 1118 1148 1159 1197 1213 1247 1283 1341 1369 1422 2160 2177
TRR	A	003	15EA	1200	1080
TRSKIP	A	001	3A6A	3293	1111
TS	A	004	2228	2189	2172
TSSW	A	004	0821	0197	0185
TSSWFL	A	004	0A2E	0129	0122 0126

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
TSTAID	A	005	1493	1089	1093
TSTAT	A	005	1C6A	1729	1726
TSTATT	A	004	2518	2429	
TSTB	A	004	1061	0700	0696
TSTEOT	A	005	2145	2119	2113
TSTERR	A	004	1B6F	1637	1635 1644
TSTHLT	A	004	248A	2385	2380
TSTRDY	A	004	1845	1624	
TSTREQ	A	003	264F	2538	1186 1258 1734
TTR	A	005	1C7E	1734	1730
TWO	A	002	3ADB	3306	2218
T2	A	004	197A	1490	1487
T3	A	004	198D	1495	1492
T4	A	004	19A2	1501	1496
UCP	A	026	3D8D	3484	1261 1287
UNEXP	A	019	2925	2579	2242
UNITC	A	004	254A	2447	2432
UNITCH	C	001	0001	0075	2231 2447
UNITNR	A	018	28A7	2571	2233
UNK	C	001	000C	0067	1778 2148 2294
UNKOW	A	016	2969	2584	2296
UNLOCE	A	005	30F5	2681	1311 1313 2174 2176
UNLOCK	A	001	30F1	2680	1311 2174
UNPACK	C	001	021E	0024	1095 1513 2036 2040 2044 2298 2303 2308 2313 2355 2359
UNPKA	A	002	2471	2361	2354* 2371* 2373
UNWACK	A	015	2959	2583	2293
UNX	C	001	0004	0064	1132 2193 2240
UPDATE	A	004	1959	1482	0261 0308
UPDR	A	004	19F5	1525	1482* 1504 1522
UPHEX	A	006	18C3	1437	1435
UPIT	A	004	20EE	2091	2088
UPL	A	004	0AEE	0181	0179
UPLWR	A	004	1E4A	1887	1873
UPTCNT	A	006	0DF2	0449	0442 0444 0447
USEAST	A	004	0E4C	0492	0478
WACK	A	002	2639	2528	0364 1756 2112
WACKE	C	001	000B	0072	1775 2291
WAITDE	A	004	2252	2201	2198 2206
WAITPB	A	004	215E	2130	0395 2114
WAITPR	A	004	21B1	2150	2130* 2144
WARN	A	043	268E	2550	1543
WASAO	A	004	0DC0	0435	0433
WCC	A	001	25C0	2472	
WHAT	A	004	21A9	2148	2140
WORK	A	002	2FF9	2661	0147* 0148 0152* 0219* 0220* 0221* 0226 0233* 0237 0240 0240* 0249 0641* 0679* 0847* 1072* 1087* 1089 1097 1101 1105 1113* 1171* 1202* 1395* 1398* 1451* 1452 1452* 1453 1453* 1454* 1455* 1456 1457* 1472 1473* 1568 1568* 1570* 1572 1695* 1696 1793* 1801 2091* 2092 2146* 2278
WRSTMG	A	017	29AF	2588	
WRT	A	001	258D	2470	
WRTADR	A	003	25C3	2473	
WRTAID	A	004	15D4	1192	1185 1189
WRTCMD	A	001	2628	2518	
WRTERM	A	004	153A	1143	
WRTFLD	A	003	25BF	2471	
WRTOK	A	006	21D5	2163	2187 2190
WRTRT2	A	001	2D62	2627	0358
WRTR3	A	001	309A	2673	0425
WRTR3A	A	004	0DA3	0424	0450
WRTR3R	A	001	30EF	2678	0417*
WXYX	A	001	0A00	0004	
XLATE	A	003	1918	1459	1474
XMITE	A	001	431F	3576	0359 0426 0500 0528 0534 0573 0579 0591 0626 0687 0717 0720 0723 0758 0773 0809 0836 0881 0885 0911 0948 0951 0977 1004 1030 1062 1116 1146 1157 1195 1211 1218 1245 1281 1312 1339 1367 1669 1722 1750 1910 1925 1961 2175

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
XMITR	C	001	008A	0031	1626
XMITRC	A	001	4200	3575	0692 0709 0785 0785 0796 0816* 0817* 0818 0818* 0819* 0820* 0826 0827 0999* 1000* 1122 1135 1166 1267 1288 1372 1391* 1394 1404* 1407* 1409 1415* 1419 1420 1425 1606 1614 1614* 1689 1934 1990 1992 1997 1999 2032 2110 2180 2219 2219 2220 2220 2510 2659 3219 3220
XMRCMG	A	013	39E5	3279	2020 2346
XR1	C	001	0001	0017	0167 0168* 0169 0169 0170 0173 0173 0174 0175 0175 0176 0180 0181 0181 0182 0182 0183 0183 0184 0186 0187 0187 0189 0191 0242* 0245 0245* 0248 0248* 0250 0362 0364 0366 0629 0670 0838 0843 1084 1087 1088* 1089 1091 1091* 1092 1094 1394* 1396 1397 1397* 1458* 1459 1461 1463 1465 1467 1469 1471 1471* 1509* 1510 1511 1594* 1603 1605 1608 1610 1611 1612 1633* 1672 1686 1689* 1692 1693 1693* 1695 1699* 1725 1729 1731 1734 1738 1752 1754 1756 1794 1801* 1804 1825* 1854 1856* 1857 1858 1881* 1884* 1888* 1892* 1896* 1898* 1901* 1904 1905 1934* 1936 1938 1940 1940* 1965* 1971* 1974 1976 1978* 1979 1980 1981 1981* 1984* 1986 2031* 2034 2067 2067* 2078 2082* 2084 2086 2089 2091 2094 2094* 2097* 2112 2116 2119 2141 2143 2215 2216* 2217 2223* 2379 2425 2439*
XR2	C	001	0002	0018	0319 1054* 1055 1057 1066* 1067 1070 1076* 1084 1111* 1126 1137 1149* 1161 1161* 1162 1170 1172 1175 1176 1178 1180 1181 1200 1483* 1497 1497* 1498 1519 1521 1593 1606* 1615 1640* 1687 1688* 1692 1694 1694* 1698 1700* 1795 1802* 1806 1810 1810* 1826* 1855 1879* 1883* 1887* 1891* 1895* 1899* 1903* 1919* 1935* 1941 1941* 1944 1945 1945* 1946 1948 1966* 1972 1980 1982 1982* 2032* 2035 2068 2068* 2079 2083* 2084 2087 2090 2095 2095* 2098* 2426 2440*
XXXX	A	004	2657	2541	1598 1599 1600 1601
X01FE	A	002	3C35	3438	1572
X1	A	004	2537	2439	2425*
X2	A	004	2538	2440	2426*
X404B	A	002	39D8	3278	0544
X7200	A	002	2663	2549	0148
ZERO	A	003	262C	2522	2428

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

THE CHARACTER ° INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē H̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
°GBK °GBD °PN 42	34258 °EC °825035°	894 °DA °FUNCTIONA	L °TESTS°°°°°°°°°	84@@84@@	°°°°°°°° 89430000
T+-Y:SM< °°°°° B-7	""8V& °°D °C.M' °BQ	+@-DO+D °BB¦H&A3/	°° -,2U °-@"3BR¦ °°	W̄HL4 °<IX2-&-@ °BQ	Z¦ °°° "K&89430001
T+-Z5<IU' °BQZ@YD	L¦& °WC& °ACH̄D8-' H	H@/ °DOH*<GT-AB-3	° U °Z1C °D>:UFAC °D	>5DFCC °AA*4FA@5S	°@5- °;RY89430002
T+-D̄OOCAQ."U¦ °K"	9IW¦ °°&2_¦ °HWDT3	9I/DOOB"9ON4<,&8	AI/HW.* °-BY7 °/1X	9OH*BF-DSI,° @ °KQ	GC °D °ĒQ 89430003
T+-,,I-MWP3O °I-@	< °JV-I-XB °&,CPO¦	$O7O*OO@CI-¬WCL3	-I-Z* °KI)¬ -¬P °°	-G7O8G3- °°° C2U °M	; 2Q °NĒM89430004
T+-%WCN_; °5_$P-¦	$O58CO5_88ET2DBE	@ °/'; °K °-OB °. °7S	°H<B&B__+ °KHW.*8	GB_@ °°°°° B-%8- °H	H̄OI °° 4C-89430005
T+-_/B"$ °/OHĒ °M8	OJ@BG °/YFHTA'¦ °°	WH&@CI-4WCL3OB43	°/OHSS¬ °O °B"@+¦@	?"¦H&XTU-."O8&B"	@@Z °° 5-489430006
T+->*/OO °."U?"C?	O."U@ °K"8¦ *.Y3W	¦."32DA&8-B"@¦&U	?=¬H&A?HDQ¦H̄GB?H	DOTU¦."32DE<#=B"	9+E8 °LLY89430007
T+-?P."32DD-' B"	9@YD&CO °.Y2Q_C- °	?=B"8OH*.Y%HAI-Y	8O8"@@Z °C4-O8+ °-	?"¦H& °HA °&O °B'-	?=GY °)8&89430008
T+-OK °°° 8 &_<OA °	.&331B43 °/O_GOH*	3F-QĒ<I-¬ °/O_GOH*	ROL4 °I-"2 J7 °/10	9+A °WO¦H&--OAH̄O@	V3@ °° J&-89430009
T+-1(/OHĒ °/<,F*B	GB"Q< °KQEIV@@ °KQ	GC °DRQBQI¦ °° WC34	° ISU@"2QZ@-D7OH*	BFUED.ED̄I"@BG °/Y	AMBO °Ē.<89430010
T+-2HD̄%BG °/YAJ23	1OH*BF-R¦.M °8& °H	H@Z °DOH*BE%BG °SH̄	I"3? °° -, °/1VR¦ °°	WCT4 °I-" °-&HDOH*	BF/Q °O#U89430011
T+-3COH*BH̄- °9DSR	$OA °<C.% °° <BGGK¬ .	°/O?6OH*BF-DOI%$	° /O14¦ °aWH̄%BGHD̄*	B °° 5_OH*BF-DZI>"	° /1U °JH̄889430012
T+-3==LO °."7 /12	ĒC °D_$SP¦¦F °OW °O	A(=*V3331("&<AT¬	@+ °, °/1D̄4 °AACG25	2L&DAIT"2-LJ; °&D	W+¬H °JK °89430013
T+-49-NI(°&DW("H	ACC1 °IS, °/2H̄XOH*	*6@BGG'M<DB6C.PH	< °K6EITaaDBQD̄OH*	SZ@BGG$> °&D ' °S"	@@YD °2C%89430014
T+-54BCD̄ ."4@@T¬	4OH*BF-<7("O@"2Q	-OH*BETZ °."4<AT¬	@+ °<@:CBQOH*/P%B	GGI, °/O4_ °O °+E*B	G °/Y °4L<89430015
T+-67 °JUXB<BGF¬X	°/12ĒC °DOD̄2P¦CC@	O#2#D̄¦D °OXL35<IO	<DK:D̄<H̄@@QK"#¦ °D	?"<BGF,& °NU<¬<!C	°/2D °18 89430016
T+-7D̄GC5O."%@QK"	#@YDD¦G ?=331<IO	'&CB¦@-O1+H ?"¬H	&BT4E."32-&./1Q	'E2"@@-D¦¦<HOXL-	A °-O °=I489430017
T+-8V@/ °D¦GYOX&B	°."OH.*BGCĒ<8&B"	'@Z °GOH*"W7H̄G °<B	GG$_ °&DC °/OHDA °°	+/%BG °/YAGS*W+ °&	BBTO ',D89430018
T+-9-PC-K@Z °-OH*	BF-EBH̄%# °/OHĒAT °	D̄"%BG °SH̄I@3 °° ."O	< °C-K."3 °/1X9OH*	*WT1H̄+ °88 °&H<@Z °	D¦D °° ¬JD89430019
T+-:&+ °# °/1D̄4 °° 1	CG3-POH*/F<BGGIY	< °C-Q+A." /16#H<)	¬OH*BE-M °C?. °/OH	Ē °J%X&*BGF¬X °/12	ĒC °D °R.%89430020

OBJECT CARD LISTING

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CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96
T+-#O+B-V3@8GF,&  .D<¬+D$ /2DQOH*  *W%BGF,&  4<¬I¬"  /1"NC <_)SP"C <  _:S:QC  _:TBQC  _:KQ M0889430021
T+-@JA&OA.POWM&O  P.R&8&-OA.P@96CO  C.RP /1=1OH*$1%B  G /QF  'UOH*BF-D  VI6$ /1X9OH**W-O  A+1@ $ZM89430022
T+-'<I*@< L>MI*"  /1D4 E(CG3_SOH*  /F<BGF,& ID<¬+B*  @*B"#OH*/G<BGG$%  &&(G /12ECH*E_  C&1@ OB 89430023
T+-=G& 7 /2DQOH*  S*-AUOH*)>OJ &<B  G /QG "&OH*BF-D  -I8$ /1X90H**W-O  A(BY@.LS ."72U Q  < LO R/M89430024
T+-"BHTO?OH*E_  G&1@@H44A KQ7@-D  .OH*#+L-&IVT UA4  HC&DWO3O1@-DHOH*  $1%BG /Q@EKQDC D  ?=LO ¬ M89430025
T+-"'<*BGHD*@D2Q  DOH*SZO- DH" /OH  E J@XZ*BGF-U@0L1  SC M|=1BSOH*E&*B  GGI, /1D4 .....  L&D :E*89430026
T+/ 8 KQ7@-E3OH*  S*- ROH*#+L-&IVT  2UFY( KR$IUX2-&8  < K"9IUU@EKQDOH*  SZ@BGFV. /12EOH*  E_ 9&889430027
T+/A3BD<¬|F| /2D  QOH*E_ &-DW(T7  A|F.2 &8@OT1SC M  |=1BYOH*|:T7B|F.  &HO|<<@Q-OEC"%  &,% &J489430028
T+/B>/O"D|A&WH%B  GHD¬ /1"NC -_:4H  HC @EKQEC -_/C1.  %|A WH%BGHD* BM<  ¬|D& B4<¬|E BM<  ¬|EY *EH89430029
T+/CZB& J@<BG /Y  A(S¬$OH*R=LOC|>#  /12EOH*E_ AK&1@  =#%BGHJT /12E||8  =#%BGG$%H&D @@C"  #C D 9A-8943003C
T+/DU& QWAL3"& L  /1D4 _CG4 G|  "=@BGHXHC:C4 I/C  2 &-@ESQDOH*SZ"+  HA-7"&-AB C4 I/C  2-J 6R%89430031
T+/E¬OH*BFYH3H/%  ¿A2QDOH*SZ04A&-4  H("HAE O..P9 A00  A.Q W(30&IS, /2H  X|&@"="HAETO||"%  @ H @Z&89430032
T+/FEA<BGF,& B4<  ¬& ¬ /1D5@5S @5T  -C )BA4 CC ACASQ  EC|5CAM<F|B5CA30  A&-Y3S< @C3"#0H*  E_ D "E489430033
T+/GNA4<I&O*( KQ  -ISL2-&-@E2QDOH*  SZ@BGF,& H<¬& V  ( -HHL|HABCOQIS,  /2HXG DWOO*( KR  $IUC 6-889430034
T+/H&OHDBE-OA."U  W&@BG /DBH2ZF|AM  WH%BGHD*H-AH9+H  BC< & /$ /2LDOH*  BF-DSI"7 /1X9C <  2ULD RT&89430035
T+/I..T/ ."72D Y  <AKGHDT. /2F*C M  /2/H8OH*/?&B@&1@  1%-CS&1@2V&> DY<  8&B"*OA BETS -3  UB& M& 89430036
T+/HF:TS -09& H  <OA BET3BH <@@K-  HOH*BF-DPHAL /1X  9C <3;CF>C M/2/H  BOH*/?&CV&1@3;02  DOD 4:089430037
T+/.A+D ?"* & /Q  @02-C||HYE<BGF-U  < 3&E<E8< 3L2<E8  8-B"*@/ )+H BC<B  &I+Y8- H<+K BC<  & /Q 9D@89430038
T+/.@C M/2/.:@Y*  ;C M/2/< ||<YECS  -3 UBLD+H BCCU  & -3 D HOOH*BF-D  PHAL /2F* HECG3&  ) (* 7QU89430039
T+/<7&1@4*&6 D4%  8&B"*OI BETS -3  UBLD+H BCCUH -3  D HO|<&Y 334HAL  /OHE J*YE<BGF-U  < 3H $I089430040
T+/(2,3F>C M/2/(  HOH*/?&B@&1@5%-:  D948- H<OI U:TS  -09A H<OA BET3  EH <@*K-ROH*BF-D  PHA& :1Q89430041
T+/+_OH*R=*BGGIY  < 3&G<E8<AKGHD90  <*MI1(S&<DH<$(%  /26A J_CG3$+C8  L93/ ."7 U HO+H  BC< RIU89430042
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OBJECT CARD LISTING

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CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96
T+/|YUBLD+H BCCU  B -3 D HO|<UY 33  6HAL /OHE J*YE<B  GF¬U< 3;@<E8<AKG  HD=& /2F* |ACG3;  "DH 7Y089430043
T+/&TESU8&B"*OA  BET-H -, D HOOH*  U:%BGF¬X /OHE J@  Y<3-& -,2UA¬B TD  %( H9A O +_8WAKO  +_@ EED89430044
T+/J; <BGE¬X /12  EOH*E_ B#&1@9 %B  GHJTB TXW( H9A<B  GG*M< C,;I-M% C,  ¬ 0J.Q4:#LO ."T  /1O 5#*89430045
T+/KR+&OH.P%V=3M  B+&&8DBRQOA N T-  -IVT DAPD+D WO<B  &EE1_ < OHONHAO  ."UCO-D99/4 ."U  @YD OHQS89430046
T+/LMB_HAB75 <  AEI<*BLVDB%BG /8  A."U9L<BGGIY'$S"  9@-DU|P8:7@BAEPM  8"2"8@Z NI¬D:7"H  AA34 J/Y89430047
T+/M|'T,¬@-E"O-H  :E?HG;C,"."T /1D  4 E)CG3V8OH*/F<B  GF,& DHAIT$ /1J  *?O4 @-D&+ -WO%  &EEO 9CQ89430048
T+/NH+ HWO% &EEO  @ABQDOH*SZ07".XI  B""HA<KOI+O8HOH*  BFYH/+O# /1"ZOH*  *W%BGF,& MM<¬+)$  /2D )J&89430049
T+/OEFCMB+&&'¬T,  ¬@YGD@Y*KOH**W%B  GF,& B4<¬+QL /2D  Q8-H.7;Q @-D+OH*  E_ &-DW(%BG /Q  %BLU "8H89430050
T+/P GOY@ B"8( H  9A<BGG'M% C,¬ .5  = |HAO,7O |HAE,/  - .W& |H&H OC.P@  :73OC.QC2/1U< S5  =IU@ 4DM89430051
T+/P#| H_-OO..Q%  :#¬HGA-OJ.Q4:#*B  GGI, /1D4 A_CG3U  -OH*/F<BGE|K*@ C  -JM-|| ?=*BGEH@  <BB4 5&<89430052
T+/Q6/C,UC U_S3"  :OH**W%BGF,& 4M<  ¬|@C /2DQOH*M'<B  GF,& .4<¬|"C /1L  4DQ P1C/ ."7 D H  O+J- #ZQ89430053
T+/R1 -, U HOOH*  U:T-AB-3 D HOOH*  R=*BG /YA.K/-OH*  *W%BGF,& 5U<¬|M¬  /2DQC "=VKQEOH*  P(L4 OC889430054
T+/E%$SRROHDPN%B  GG'M< C:OIVU<BB5  #I-%<BB6D|Z%8HBR  Q@Z )C H_¬SR|| H  _¬OOB.QH=WOOR.RO  'TLO 4Q889430055
T+/$X 26)@Y*HCAU  _XT3|| <_XOO IWD  WO&7"&?@>*?HAF@B  GEB<'$SRR@YD&+B  WO< &E:M'¬KRROH*  ONL- ;A@89430056
T+/*SHBRQOA BE%B  GGI, /1D4 F)CG36  ?OH*/F<BGE3H'¬KR  RO DPN-OR.R8'T&7  "&?@>*%BA /$ /1;  C|P4 9B089430057
T+/))IVX -J$?|O8  WO* AE:P /O'O( -  P)%BGGCU8DBRQ@/  3+B WO|H&HC/ IVT  2DA. /1*90H*E_  D&1@ *S 89430058
T+/;Q<|P /1*9|P4  WO¬HABC5>IVX UA)  OOH* CUHIV, UA*  90H*NFC&HEA| /OH  E-KD=U%BGG=X /12  EOH* 8D&89430059
T+/¬LF,& Y4<¬|V|  /2DQOH*P(L5'IVX  2-J '$SRRO DPZL4  IWG -&HOOH* AH  F $ /1X90H*BF-Q  UHH& J-089430060
T+/-+C D=*BP|OH*  *W%BGF,& GM<¬|XG  /2DQOH*E_ &-D  W(%BGE"Y@ YC||@  WC%BG L |""OH*  R=&O =8D89430061
T+//IA4HG&AM| MD  O&L < MD4&L.B HI  C|(@?=MO# DE64-D  @C- ?=KQ_OB QH O  A&P_A;&OAFHZA¬3S  ."4 :#D89430062
T+/SD@/ &| (C: O  A&P_A+-OAFHZA¬LO  CKQ-<"4D>&2 <HD  >&S @"4<-OH**W%B  GF+D<"4<-&K8<HDH  -&B8 4AU89430063
T+/S"OH*E_ K*J  I-<BGHJ-<"4D>&2  <HD >&S @"4<-OH*  *W%BG&%B | MD  4IS4( MD4&L$2 &Q  < MD 3K<89430064
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CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/T:(DD8C-EA<BQ	_C&EA;4DOO DQ*&@	A&LAA<<BG /. /1/	1(-RO O FH5A<C>	FH4:&AS_C D?=MD	OC-D O-M89430065
T+/U5."U?=&8A."U	?=L?-."-:&B"8C	Q,B"8| ?=*HAFH1	9COC2DA/8B C2U R	9A-C2UA('Q&C2-&5	:- N$ 89430066
T+/VO@Y*G;G OA	R<'HA L4 ."U@"2"	9OHDRFOOA&A&Q.*B	G 4BAX8O-H CO	IW + KQEIT<8-BQ	G@Z E:D89430067
T+/W,BCD I-M:-BQ	D+ YWALUEI-P2U -	#-BQE+8 WAC-AI-¬	2U #S -D4 /V-|H	WAHGHT5;I-P2 &*	@"2Q "B*89430068
T+/XWC"HGJLOBI-Q	+ KQGI-¬ HAW4C	WA2QFO-DWA1O CI*	G R# C /OH; KQ	EI*@< KNDI*@< LF	>I*@ JZ%89430069
T+/Y/(HRQ.- |H	&A<BGFOP /O (-	E&CO |"%@"4<-|&	@+% AFVH' -YC@-&	N|& WQ|HAC%BG /D	FH2Q L2 89430070
T+/Z*T%BG SHI"%E	QFTC2/O$3OHC3O+C	3S< 5YBQOOH* C&	HFD%< JDG|F8@"TO	:@Y*+(EDOOAFY*	@*CO ECM89430071
T+/DP LO:@5S @5T	COD?=K"9<E-@<O8	A."UW.*E)FDO(K"	9|CP JZ%<N- CA	Q|CXAPJD%+ D@+T3	"|CY 2LH89430072
T+/,K@Z D| @+?(	Q-|(Q8|+HO<BG	@AKQDOH*SZ3&HF8&	4 /> (&D$/ OVIR	VU&OAIOYV3OOGIR	,A-O @J889430073
T+/%(2O;IV*< 2O	YIV*< 2O2IV*< 2O	@IV*< KQ*I/Y; KQ	* &3AI/OW.JOAI/8	CO-IB G4 |HAHAO	AF2U ¬/U89430074
T+/_HAJO F2QAG	$IOD<"4<¬&2 <G4H	-&SF< C3 I/D	@"2Q&| WH?+H TF	<I/Y1SSQ*<QUWG%E	QF:Y R3-89430075
T+/>C@8YBOQY$/LB	<IS OSSQS<HUWICB	.ISQ5 KQ*|& WD|H	AACOGISY' BQDO D	SZO8AF8&W<*HB C	/O MOQ89430076
T+/>= C7O|"? -J_	?C-DWDSQ_OH $YT4	I/C2-J3 /1_<| H	WH%BGHD*' BQDO D	SZ3OHIS, /2HX|&	WH% 1L*89430077
T+/?9-J_<OH*SZ3&	HF"¬ /1D4 ECG2Q	"L&DAIT¬2-J-@DBQ	DOH*¬5&OA.P&W|OO	A.PQW(@BGHD¬ /O	(- O9889430078
T+/O4GC-4 JOO(H	*(<HB.P|B MH OH*	¬5RO CK &GS -D	4 K"9C&D?=JOOO D	*DHOA K"#O-D <H	B 9LY89430079
T+/17OH* C&HGIU	< KP8IVD< KP:I-M		2R$IV? /OHKOH*	E_ H&1@V=747 |H	AA3D IVT2/21(-H	WL|H 53%89430080
T+/2D &O* KR$A3Y	&IVT2/1/(-HWL"H	AA3Y-IVT2/OU* BR	R 3Z IVT /O (-	)DOOAI¬-WMOOAI¬Y	WA*)8*89430081
T+/3V/1D4 /CG2P	#L&DAIT72-NJ(&D	W+"HAC44A KQ9@YD	1(-)D"HGACO-IS,	/2HXOH**+L-&IVT	2UBH KHM89430082
T+/4-OH*)I@BGF@$	/OHEV%BG SHIG@B	G /Q@B2QDOH*SZ"H	GBCO<IS, /2HXOH*	C&HGE&< K?VI*@	<GKO 4.-89430083
T+/5$ 2?V@Y*D(-	)Z OAH@*V300). <	,100A."UWO3&AGRO	4 /6-OH*)ZLOAGNY	@ J5$O-D?=<HBH1Z	8 #L%89430084
T+/6O@Z I. @% O"	/16VC-)O/5E8-H	&|&D)O"HAEC5 GN,	J5R|)O30BGN,	/15R|J)O% AGNX	/OH 'TU89430085
T+/7JFZG& 0-H	<BG 4BA6:OH*	BFYD:. <<GKOC. L	/O (-¬P<BGG'M	< 256I-<4 J'+(H	¬MTM 3#889430086

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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/8< J'*G >V	* K5@ -OC.PY>W O	.PYOW O .PUHALO	W.X<@ K"@+H >V|H	&¬T/ .ZL2DFO8HB:	M@/ 73-89430087
T+/9GOT-&.ZL2DD&	8BB:M@/ >+ &>V|H	&FC-B.ZL2D C8 S5	'C D>@MD2(&EA(|H	GN*HB.P7B L7QI	8F|H 7H%89430088
T+/:B/4.B S5'O-D	=YCO +AT2/3|B S5	'O-D#SC1-+4T2/2L	B S5'O-D8F|HGF*H	A.ZXB S5'@Y*+O-D	>#O O @89430089
T+/:'BB6E.O#B S6	F(D>@L&A.>" /1'	)OH*E_ C&1@W @B	GG94< K"#IT" /1"	NC- ?"BQ_C D_)B"	#|BQ 81O89430090
T+/#8.XG8 S56| H	_)*BGG57 /1D4 E	CG2"#OH*¬>L50."%	@*B"#OHD;Z%BGGD3	B MH O-H_*74C |H	ADP4 59U89430091
T+/@3"OC -J"O4-D	A8-HAOH*;@,OC +H	B $7" |HAA#3" <B	GG03 /1=)OH*¬5L5	O."%@*B"#@-DD|FD	?=OO 7&H89430092
T+/'> K54."%@(25	5OH*E_ A&1@?=@B	GG97B & O-H 8	AG5OW.@BG 4BA=	*(&D>$#7" |HAHX7	" |H 5&%89430093
T+/=Z-J1'"-C2 &T	B L-Q(D>@RO C	K &GS -G /1'V(&D	>@*BGG7@4 K#?OH*	C&HG#-("292&?"	J@ ;T<89430094
T+/"U@ 4¬.ZICG@	AG"C /O (-¬5 7	".XIB"@ AG>Y(G2:	K&1" J#DOH* C&	HG=-<"2:K.Z<<G26	L.R& 8#D89430095
T+S ¬O"* C&HH.|	2/O-@BBQDOH*SZO1	I.3U?+-11.8&7/&O	G.7-OC&OG.5<OA&O	<.4*99*BG /DAKS=	DCDU 1AM89430096
T+SAE.8&?3@BG /D	BKS=DC D?4KQEO-D	_-%HB&-?*C2=D BO	|.7 OH*BG/ ?/B@	NOH*BG/ ?*8@9OH*	BG-H 1R*89430097
T+SBN.'D>@O4¬.3U	?E¬HAC 4¬.3U?@¬H	AG¬HGC<BGH.T /OH	E-MY?/ 11.8&?+*B	G /DAKS=DC-D?4K"	3C&D J,<89430098
T+SC&.'D?'¬HAB_H	AD+H8D<8GHC, /OH	EVT4 IS, -& OH*	U2C&HHJ 4 KDH(H	/C 1I.8&?/&1C_8&	?+*H) 089430099
T+SD. K'VO-H?&O4	C2 &V@& B@& C	2/OR@KOB@KO 4 K"	9C&D?=K"7@YDH4-D	A8-HAOH*-6<HA C	8 - :H%89430100
T+SEF <BG @*B"	#@Y*D|FD?=3&HHN4	8&B"'@Z O+ /B "H	&C44A KQ9@-D|OH*	/P?HGGM4A K"$@YD	NL&D 6SY89430101
T+SFA KQTO D)BC1	IS, /2HXOH*+6@B	G 4BBF4C DV=SQ	EC DV=BRJCODWEBQ	MC-DWEBQ_+F WO"H	&(< *OM89430102
T+SF@/109+A WO|H	&GP-HA% &HPJ(&*	W&"HAETONISY< K"	9IU| /2HX| OWH%B	GHD¬ /O	UW%B	GHD* &-Y89430103
T+SG7OH**W%BGF,&	C /2DQCOD	WEBQMC-DWEBQ_+B	BB?H&8C5"I/| -&H	OOH***L--IVT2D *	8&BQ 01%89430104
T+SH2O|H&.<8GF,&	AD<¬<|P /2DQOH*	E_ &-DW(T--IVT	D HO|O8WO*BACHL	/2GN+A WO<B&H)M	8&B@ JIU89430105
T+SI_"¬H&BCODIS,	/2HXCODWEBQMC&D	WO2Q5@YDDOH*S(@B	GGCU(KR$IU| -&H	OC-DWEBQ_+ -WO@B	&HVH @H-89430106
T+SHYOH*</C&HHDQ	+ KHS(&DSZ/OA+_U	AC-DSZT,$C¬'B DH	CL5B D: COD:6KQ	_O DSS*HA C /O	(- 3 89430107
T+S.TI+U< BL(ISY	' KQD@-DFCADVUBS	X|&HWH?HAA-O&IR	Z 34CIS,2 &Q<CKO	&H|H'ABQD@-DFCAH	VUBU 7#Q89430108

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T+S<;IL4EIS,2 &Q	<C2O&H+&'ASQDə-D	FC OVUBTH|&*WH?H	AA-O.IR Y134HIS,	2 &Q<CSO&HJH'BKQ	Də-D ',889430109
T+S(RA-O(IR ZKT4	HIS,2 &Q<DBO&HIM	'*C2QDə-DFCA&VUBX	D|J WH?HAA-OJIR	Z;34-IS,2 &Q<CBO	&HLH E2D89430110
T+S+M|J<WH?HAA-O	KIR ?TT4MIS,2 &Q	<C2O&HR8*EKQDə-D	FCA VUBW?|JQWH?H	AA-OTIR Z:C4P1S,	2 &Q #Q&89430111
T+S||CA<VUBZE|J-	WH?HAA-OOIR D*L5	IS,2 &Q<BKO&HLO	'82QDə-DFC 8VUBV	R|&OWH?HAA-O|IR	ZE* K:M89430112
T+S&H/OH; SQ-IET	/OH; SQSI$./OH	; SQUI$3 /OH; SQ	WIR8< B&BIS, /OH	EOT VUQU OM*BFYH	,I$O LQM89430113
T+SJE|&-WH% AIB*	8AB:MOI ¬=<BG /Y	BF2D<OH*¬=C4&IS,	-J"8|JMWH?HAA<B	GGJL /OHE-&499&O	¬.8 JY<89430114
T+SK .ə3<IK'-.:?	/OHE-UQ?- OA.'D	WF-OAIGD7OəBG /8	B.'D?|%BG /8-	?- 4¬.8 ?ə¬HAB&4	¬.6 ¬SQ89430115
T+SK#."G2-&T /OH	E-MQ?- 8AIGD7O&8	A.'D7O&4AIGD71*	DIF. /OHEVU4B SR	<ə-DIOM*)I3BG /D	O|K $-Q89430116
T+SL6IS,2-JD'&BQ	DəYDHOH*BHYU OH*	BE%BG /DFHK5/C	U9KL(OH*BHYU OH*	C&HI&*8- H(ə/	||M 9.Y89430117
T+SMII-P2 &-'O-H	OHDBE%BG 4 KM	:(HV|T&DI/-5A8Q	%ON4VO%FIIKCASBN	MOQOV.3OCIS,2/OL	AS2M ':Q894?0118
T+SN%MTO I/CB &	O-H CMDI/T3S G	/2MH| DWH%BGIL<	əASQDOH*V<3OEIS,	/2M31<PV2*|E&+¬	X&D 2,489430119
T+SOX&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA 8>|A8=L	S¬>¬X9=) &<|A6P#	X9=* E0489430120
T+SPS94A 8əGR¬>¬	X9=) &+.A6P#X9=¬	X S¬5P1D A7ZDəL	E9*XC1MCX917A EO	P A* EO P A* EO	P &:U89430121
T+SQ)P A* EO P(X	T5¬C2DMA 3¬"<TH	.&HX'-<BI"H	C BOI	VB &-	NA-89430122
T+SRQ	& C Q	A MA&("ə&E1AəDG	&Q*I&OUA O&/ 1<&	A$(UA$FE &FA-9=¬	X90 =A*C9430123
T+SEL "|O	*-CWO)XN2)PG&FA	6;|N&|C1Q|C2&(P	O84CR9(N 1_$R&+|	H2;I 1<PV2*|E6;|	N&| :TM89430124
T+S$+əMA-&<|H1*|	K&<LE9*XC1MCA9*G	I4əGB2)|I8=TR8'N	ə|E QDCD1;PIOəN	9(¬DD;|E6;|N&|C	2&F 7:089430125
T+S*I&(LO1<PLE4C	D1;PIOəN 8=TP1MC	D1;|E6)LI5*GT2)$	N6;|N&|C3&FA 6*X	P5'|E&<LA8əE 8əP	S8'U KI&89430126
T+S)D8'N ə|J QDC	S2)PG4əN OəTA6*G	C8əPR&+|E8>|R8'N	ə|N QDCR1*GD&(L	O1<XF2*PD&+|E8>|	R8'M "8-89430127
T+S)"&|C6&FA 9_X	I8əN 1>LNO=|I5_N	8əPS8=I O)PD&<P	A9(XT5MCO'4A-&<X	N9*GL2*J O*LD&R_	1<M NYD89430128
T+S;:8əPC8əXO5)X	T5MCO=DA-&<XN9*G	L2*J 1<GTOMCD1:|	EO=|I5_PR8'N ə|V	QDCU5'¬E6OGL5>$	E6M 81U89430129
T+S¬5OəGS1MCA4'¬	HOMCT1:.T&EA O'$	N8əXN9(SU8UCP5_|	L6:|N&|CA&FA 8əP	S84CPO;|T1)XN&<X	N8>< M3889430130

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+S-O6;LC8əXO5;.	R8'N ə+) QDCTl;.	T&(¬A8=|E6)N 9'X	T5MC1əDA-&(.E:<.	OO)XD&<$U5*\|T2)$	N&+< 2CY89430131
T+S/,1;.T6;|N&|G	1&FA 9(¬P1)V/4'$	W1)V OəGS1MCA4'¬	HOMCK1;TB5%GR1DC	T1;.T6;|N&|G2&FA	1<U ¬.M89430132
T+SSW8_¬LO;/ 1)P	D&($F&+|E8>(5<P	S8%GG1*GT8əGC2D_	5)$T&(XEO*LY5)$	T&(XD:FGU5*XT&<|	H1*< 3, 89430133
T+ST/4%XN84_ 6*P	QK6GN5>(O;PA2)(	.5)R 2)PT1)XR9(¬	T2;|B&<XN84CE6)X	O6*GT8əGC2(LE5;(	Oə- "D889430134
T+SU*1*|K2)PT&(¬	N1DCN5>(5_PA8=|	AOə/.&<TU5*) O>L	S:<LA8əE 5<XSO'$	M5əGR1;LN1;¬P1*|	T1*& EOY89430135
T+SVP&(XE8_¬O5;.	E6;PI&+|O&+.E4əP	C8əPO84CT5UCC5<L	D1;N.&<TU5*) O>L	S:+LN1;¬P1*|T1*J	9%D :.H89430136
T+SWKO'.U5).N5>$	N&(XE8_¬O5;.E2)P	C5_XR1*|T&(XE8_¬	O5;.EO*|C1)¬T1*J	2)PVK4CA1<LRK'X	E8_* M3 89430137
T+SX(5_PS1MCSQ*I	1)$T9_XO5*) 8>|	A8=LS&(XEO4?M2*|	R5UCC5%LE&(PO84C	L5%GD1*LU5*PX54_	2)N 4R889430138
T+SYH8*V.&<GF8əP	B&<|O5;(.&(¬O4'(	2;.S9<PO5)R 2)P	T6M_ O*$T1)V əUC	S1*(.&+(.5U_ 2;.	S9<M N$-89430139
T+SZC1D"D9(XI5*)	O'$N84_ 5'$L4əX	NO'$R6*PC84CS8əG	T9+I 6*PC1*XV1*J	1+LR2)PG&<|O5;(	.&(* &H889430140
T+SZ=5_|LOəGR&(P	O84CE6+LA44CT5UC	S9)XR1;.P5_PS1MC	WO;I 5)ST&+.TO;|	U8%PRO;.E&<GL44C	U5)* 8:%89430141
T+SDQ6)$T1*|T1*J	1)XR5_XD2*GL&<P	BOəLIO4CC2<6RK4C	T5UCB1MCR1)¬EO;|	E1DCI5;|O&<LA8əE	8>Q ə2M89430142
T+S,4&|(,'D_ &(X	E8%PT&<TA4*(1?(	.OəGU8əXO5MA-&<P	R6)$R8UCMO;/ 5%|	C9(V 2*R OəTA6M_	2;H "E489430143
T+S%?&(PO8<LVO)|	I1(PO&<PR6)$R1<P	V2*|E&+¬X&<6VO*X	LO*.L1)$P1)XA8əX	O5MCC2<PC4UCC5_P	T6)Q M-Q89430144
T+S_D44CC2<PC4UA	&<LA8əE OəTEO'I	&DA &DCE6+LI5'L	E5;(OəTEO'I 2)P	T1)XV1)PT2)$N&(X	E6<< R.089430145
T+S>V5_LMO)PD&(X	E4*PC84A 1<PV2*|	E&<PN1DA &DA &+L	N2;(8_¬EOəXF:DA	&DCD1;PIOəN O>L	S:D)YH89430146
T+S?¬&DA &+.TO;|	U8UCR1*|E2;PE1DC	F6)$M&<LE9*XC1MC	X9=.TO;|U8UCE9'¬	EO=|E1DCF6)$M&<L	E9*U *HQ89430147
TA87VOəN 9=*	.....	.....	.....	.....	..... 3S489430148
T+SO=&<XF&<LE9*X	C1MCS2(SU4əJ O&N	O;PA2)|AO_|E&<G	N1DC18UCM5>(.&<|	H1*|K&<|OO;) OəG	B4əM QOY89430149
T+S198UCA5*J/5_V	6*PF1)V 8'R 8əT	E&<LE9*XC1;|R5>L	B4əPS2($O8əXN14C	G9<XD1M_ &+.S9UC	OəM NQU89430150
T+S245<GY&<.E&+.	E84CT5UCL5_$P&(X	T5MCOəMCF5_V O'$	N8əXN9($U8UCP5_|	L2)PGKəXF&<LE9*X	C1M əDH89430151
T+S372;I OMCP<*X	N8əPRE4CC2<PC4UC	F5_V 1_$R5+I 5'X	O5əPR4=/ 2)PS1)X	T1*J.&($N&(|I5*N	1;< &# 89430152

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+S4D04?05}|Y&<G	VO*XLO*.L1MCD1;P	I0@PS&+$I4*(0%N	9+.E1DCI5RCF5_|	L5>$I5*) 6}$U8@X	N1;H *YU89430153
T+S5VK4CR1;.E8<C	HO}|T&+|O&<¬O&($	NK*XE8%PT&<TA4=(	8*R I%PTO@/ 1<P	V2*|E&+.TO;|U8-H	X*NY ¬I089430154
TCB521<PV2*|E&+¬	XDMA 0				R:U89430155
TAK:Q*0 B&|'-					"E&89430156
T+S#V0*.C1<PF1@T	I4).L5(PO5*TR8>|	U9;$X:+XO@¬.3*|P	6*"T9&EA-QMZE;U_	$E7_<PF1@LN5_¬M9	;$X8 8/*89430157
TCK#3L5*?¬6," |@					51489430158
T B@:&					MS889430159
T+S="&<GD1(V &DC	O&|E @UC3&|J *MC	6&|) =DC9&<E OUC	C&<J 1MCF&DA &DC	O&|E @UC3&|J *MC	6&|* ¬Q 89430160
T+S":&|/ =MCA&<I	04CD&<N 1- 1&$	F1%$F1%$F1%$F1%$	F1%$F1%$F1%$F1%$	F1%$F1%Q DD<-.8&	A 2Z<89430161
T+T 5* 1;¬P1*|	Y1*LR1*|E2;PE1<L	IO)(0*LD6MCO1UC	D1;PIO@N/8UCY5>J	9%XS2DCT5UCT1;.	T&<U 6OH89430162
T+TAO5;|O&<LA8@E	8>R @674K4A 1<X	A44CF1UCT5UCE5*J	4@XS84?R1;.E84C	HO}|T&<$OQ*$1&<G	F8@M 42Y89430163
T+TB,6MCE0*|H&<P	N8*XYK@XN9*GL2*J	1<PV2*|E&FA 8*X	Y&<GGO*XN BI"N	G;/*PE3D1;PIO@N	9=* 6A&89430164
T 3B?PEO}&					#$%89430165
T+TDD OHX@*HC S¬	5P1E 1>|E8>(5@G	T8@PR5MCS1)TU1)P	C2)PGD*E&@M_ 5*X	E8>I 8@PS84CR1!T	U1;H 6Y%89430166
T+TEV84CT5UCCO}|	L&(PE9=<JO>.S1)T	U1)PT2*GL&(¬A8=|	E6)N.D*N @U_ 5*X	E8>I O@GNO@PLL)$	R&(* @ZD89430167
T+TF-O¬I)8*R 1<X	SO*$N5*PC84CC5=&	J1_.A5*J 4@PA9*N	5@GT8@PR5MCF5_V	5%$FQ(|I5*N 9+.	A1@M 0$Q89430168
T+TG$K1GG5/7YO*L	RQ|$O*\|)$AUC S¬	5P1E 1>|E8>(59G	T8@PR5MCS1)TU1)P	C2)PGD*E&@M_ 8*R	0@D 38089430169
T+THO4*(5*PX84C	PO;|T1)XN&FA O*$	T1)V 5*XI5;|I5**	JO>.S8*$P8W_ 5_¬	E5MCC5>PE6O_ 8@T	E5M :H489430170
T+TIJO*|O8%N 2;<	JO".W2:|H2)N *MC	S1*|O5*LSK1GE&|I	.&<XF&<|O9*PR&<X	S&(|EI>(9() 5($	R1M Q-<89430171
T+TH<8@TA5MC5&+.	EO4%J1_.P1*J 9%X	L44CT1)XM2)PA8@N	O)PD&(|EO;PE&(¬	A8=|E6)N.D*¬OG;T	A1(U 0B&89430172
T+T.GQ|$O&D)&AU	C S¬5P1GAMA5-O*.	C1<PF1@TI4).L5(P	O5*TR8>|U9;$X:+V	GO3N5_N 1<XS5*|	A:AD "8089430173
T+T<BOW)&A|C5_¬	Y&<GB5>PE&<XN&+|	H2;I 4@XN1MA &D	)&<XN8%PR84CC4-	GD J0"):D*@;5_	%KV #9%89430174

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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+T<'PD5]$M9E;X'	<$W'-¬V';¬OD)=|C	1@?|4'¬$7=|V,K6C	AD*N G*TC5_¬Y&<G	B5>PE&<XN&+|H2;I	4@U "_%89430175
T+T(85*N G)-J1;-	)QAGFMA7U$=.E44C	P1)N 8@PS8O A7	Y$>.E44CP1)N 8@P	S81GG5/7YO*LRQ	@E489430176
T+T+3G;-C S¬5P1E	&C1 :<PHD*E|2<-	JO¬¬H2AGBP@THD*|	G2<-JO6"H2AGD5@T	HD*J"2<-J1;¬H2AG	FL@- @H489430177
T+T|>2AGF'@-JO5?	0@AGDO"COD*J-8@P	S84CPO;|T1)XN&<$	O6MC3@?¬7Q|DJ1M"	A4@XG5)LE5;<J1¬A	*GM QKD89430178
T+T&ZD=LN5'XO8@P	C8@PD&<LA8@DJ1%W	)QEOJ1?-@15"E1JG	F$J7YO*LRQ	)Q <BI"N"|<E&1*-	JOV@ O8Q89430179
T+TJU2<-JO6"H2AG	D¬@THD*R|2<-J15"	H2AGG:+|E8>(5@C	T8@PR5MCF5_V @".	7'6C2D*/?2<-J1G#	A4@U ":-89430180
T+TK¬1'PM1)PTD*V	"2<-JK4"H2AE<P@T	HDM3XPA5 D=LN5'X	O8@PC8@PD&<GR1*E	&DA GO@*DM5?2<-	JL_* 3Y<89430181
T+TLE@| JLX"H2AE	)9"CODNA|2<-J4N"	H2AGK$@THD)("2<-	J5M"H2AGOP@THD))	?2<-J6G"H2AEELAT	HDN% KKM89430182
T+TMNP@THDN1?2C1	&<MJP+M):<GD6O	GO C S¬5$15	-1_$R&<|L9+.T1)X	E1DCP6*XN8@PR8UC	DO;< &. 89430183
T+TN&OMCS2($U4@J	8>|A6;(5*PX84C	L2)PE&<TE6*N QFA	-QFA-$%|H1*|K2)P	G&(¬R5%¬RO)J @8G	BQ*M =$<89430184
T+TO.6*GS1MCU5}¬	R5>(.&+|O&<GD1(V	/1+LPQ*$I1)|D&(L	A6)I 5_XD1)XSO*|	OD178|<PO@J7H|<R	&OJ4 O8M89430185
T+TPFQC3GP@HJ1(¬	1AJGE:A.FMAGFK/O	;EJUJO=Q):<GD6O	GO C S¬5L8F	B-8KE/Y:HSQD<TQ:	|UID $YD89430186
T+TQAUZ+MVREPWIW	EXR:¬DMCXGOBSY:K	VZD;YDED%,E:?>,>	@?$:"-H>$XHB/D#B	1%,+4)$E7>GUJOM@	)&DD EJ*89430187
T+TQ@&U(DJMRGKDV	JMV(MNNRPOEVSQ6J	VRW)YEPA1*X(4)PR	7;GUJO¬*)Q<GBO@L	E1%¬H2)GK4'LN5_¬	Q6;H KR 89430188
T+TR78=LV9>¬Y:¬C	1@?|4'¬$7=|UJOV@	)&DA&QFG 4+C/D*|	GGOAHK41(LU'EO51	)PV'DE61_$W':;71	'¬X@ 79*89430189
T+TE2D*(?GMCH2@3	(3$"E6'3)7_"D:=3	_#>":="3'"/GD515	-5OGL&<|H1*|KE$M	N_JMJ1MCE5_J O@T	EO'H 2BO89430190
T+T$_>JUJ1U@)&A<	J1'Q):<GD6O	GM J1<¬" OHX'M"	N1;R 4@XN1MCF9(P	C8@XO5MCC2<PC4/P	N1;Q $H&89430191
T+T*Y&(|I5*N 1>L	NO=|I5_MN5*PW&(|	I5*MN5*PWE)PE9UC	L2)PEE)PE9UCL2)P	E&<$U5*\|T2)$NE)P	E9U $1M89430192
T+T)T4@XN1MCF9(P	C8@XO5MCC2<PC4/M	)L+|H2:I 1<GTOMC	N5>(9*XS2*.L1OG	E5_J O)PD&(N/44C	I1'M ¬2*89430193
T+T;;5_XE1AMRGMC	E5*J-5%R-5<PS8%G	G1OCT1)XM2)PA8@P	S&(¬R2)PTFJP25*J	1)$M&(\|I5*N 5)$	TE'O 1.%89430194
T+T¬R5MCP6*XN8@P	R&(5U8'¬U81UJ1'Q	):<GD6O GM	C BABG4<¬0*|C5_X	D2)PG&+|O&(XO9+|	I5*M N%89430195
T+T-M&|C2E4CD1;P	IO@N 9=) 2;I OMC	M5%LE44CX&DA &DA	&DCP6*XN8@PR1<X	S5'|A: HX@MY@&DA	*D** 2%U89430196

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OBJECT CARD LISTING

CL 1 THROUGH 16 | CL 17 THROUGH 32 | CL 33 THROUGH 48 | CL 49 THROUGH 64 | CL 65 THROUGH 80 | CL 81 THROUGH 96

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T+T/|P1<CP|@BI"P  8G;TD1;PI0@N 9=*  )OJGAM+|H2;I 2;I   5($D2*$I1*J 1<G  TOJE & <BI"PBGOE   1<M N2H89430197
T+TSH5'XE8>H)Q+|  H1MCI5*LI0@GT1*J  O*XD&(.E:DA-&FA   QDA-&<XT&+.H5>L  L1DCB1MCD1:|EO=|  E1D  =J089430198
T+TTE2)PS8@GN8'|  YK4A 2*R 4%PY2;I   5)$T&<XN8>|A4'|  E1F_ 1<PP6*PS8UC  A5;/ 5>|H1)V 0*X  D&(H '2H89430199
T+TU 1;/ 1;¬C1)¬  T&<|L1*GR&<GN1DC  F5_|L5>R 1)XR5_V  5+.GK1GBP17YD@$  81<PP6*PS8UA-&<P  N8@M 2D@89430200
T+TU#6&<   HX@*H  J1?TD1)¬R1;.S&FA   &DA &DA &DA & <  BI"GBD*I-O*XD&(X  EO@PI9*PD&+$A8UA  -&D  $$*89430201
T+TV6&DA &DA &DA  L*TE94A'9=)'PHC  T6;/ 0*¬A2)N 5_V   1<PP6*PS8UCP0OC  2L*|NO'()&+|O&<¬  O&(Q ¬LD89430202
T+TW15&<BI"GBD*I  -|<$7& <BI"GBD*N  0*$R6@PC84CA2*J  9%GS&(XE0@PI9*P  DE4CB9+( 6*PS5'$  N8%M LRH89430203
T+TX%&DCWO;I 2)P  C5_XR1*|TE4CS1*N  5'X15;|E6MCL5%)  5>LT 4A.9'LI86G  R1*( 1_|DK77E5;|  E6M  9Z*89430204
T+TYX&DA &|GP1WC  1&DA &DA @_¬FQ|I   &DA &DC35@R-@4A  &DA &|LP1WC4&DA  &DA ')¬FQ|N &DA  &D  1$ 89430205
T+TZS'_¬FQ|R &DA   &DC75@R-'4A &DA   &|TP1WC8&DA &DA  =)¬FQ|V &DA &DA  :5@R-@¬A &DA &G?  P1W  2IY89430206
T+TD]@¬E &DA &G3  P1WC1@UA &DA @+|  E8>( 6*PQ&DA%5@E  -@MA &DA &F@POOC  2L*|NO'(]E'¬AQ|(   &D  09*89430207
T+T,Q&DA $*|L1*G  R&DA &DA=8%PL&(¬  E5MA &+$CO)XD&(X  D6MA Q(PO&<GI1DA  &DA 9(PR5)$W5MA  &   QH<89430208
T+T%L  B UC]DUA   DMCA&<LE5'XF8>H  C2)PC5_XR1*|T&(X  E8>LL9=I 1_XO5DA  &DA &DA &DA  S¬  5&EO ¬T@89430209
T+T_+PE1*1<PV2*|  E&+¬XGOCP@J5 9|D  )Q(¬2GMCU@/5-5"<  )&+L3GOCP'A5 9|&  )Q(¬5GMCU'J5-5"Q  )&+& N1Y89430210
T+T>]'/5¬5"*)&+L  7GOCP=A5 9|- A&<  BI"E AJ<E|DCQ6&M  J&+<EA)&EDUA@1JI  01E ¬L1 OW J&D   CQF  ;2039430211
T+T?D E3D1;PI0@N  9=*)Q(¬1GMCU@J5  -5"M)&(X2GOCP@15  9|<)Q(¬4GMCU'A5  -5"M)&+L5GOCP'/5  5  41Q89430212
T+T?"GOCP'15      )Q(¬8GM  1OA-"¬                    )Q(¬1GM  A5-5"H  )&  GOCP@15      )Q(* ¬T-89430213
T+TO:'A5      )Q(¬  5GM  A5-5"Q)&  GOCP'15  )Q(¬  8GMC= S¬5&AD  |  GQE9 &<D  G=E-&  *I889430214
T+T15 S¬50- @&DC  1 OHX**.3G¬8@&DC  2 OHX'*.1|DA ' <  0I"PB|DA  <A$(U  B& CD1 <@(309 S¬  50/4 RCQ89430215
T+T20Q<XN&(|O9%P  R&<|A8%N L*GL52T  A&<XF&<LA8@E 1)P  T6;/ 4%LBPMCC5_¬  Y&+|H1MCF5_|L5>$  I5** #3489430216
T+T3.D*E=G;SQZYO  RY:SUSREP-EHD/Y;  HURHLDE:CZQHNVAG  CL/5 D1GC:J5-D*P  A2*R :(8U&<TA9*N  OM  3T<89430217
T+T4W1<GTOMCE5:|  R:DCK0%J.&D7N9(L  E6*XC8UCA6*N 9(¬  P1)V 0@GS1MCA4'¬  HON5 1<PP6*PS8UC  T1$H # M89430218
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OBJECT CARD LISTING

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T+T5/84CR1)/.&($  T2<PR9%XS1O_ 1<P  P6*PS8UCE5;|E6M%  C S¬5O/5-2)N 9(¬  P1)V 0@GS1O_ 0*$  P:D  N/&89430219
T+T6*8@TE&<$O4'|  O9%XN11GA¬/7Y6+$  E6;|Y9<XO5@GS1<$  G2(GK4=XXO=PB5)&  JO48)&A<JO=U)QAG  E0;<  7-889430220
T+T7P2<PNE4CD1)¬  R1;.S&<PN8@PR OH  X'*H)Q<PR6)$R8UC  W1)XE&<LE8@PC8@P  DE<GN1DCL5%¬G1*J  5>&  * %89430221
T+T8K84CO5MCT2<N  5'XI5;|E6M%JOW   ):<LE5'XE8>I 1)P  T1)V 8'R 6*PT6;-  JO"GD1)¬R1;.S&(¬  AQ|H 9&Q89430222
T+T9(L*|NO'()&+|  O&<¬O&($NK4A Q<|  A9+|I5_N-&(XE6+L  I6*PS&(|O9%PR&+.  H2*$T&($N&+.O5<N  4%M J$&89430223
T+T:H:<.D8U%C S¬  5¬@PN1DCO1UCT1;.  T&<$O6MCD1;PI0@N  9=*C9_XO5*) <G  TOMCR1*|F2;PE1DC  F6)Q =1089430224
T+T#C5DCK1;TB5%G  R1 I 7E.CE/GCLOH  X'O.U5'¬E6MCCO;.  EQ<GB0@LE1%¬H2)G  K4'LN5_¬Q6;.T9+P  W9=- a/889430225
T+T8=:MA &DCL5>$  E6MCCO;.EQHFB-8K  E/Y;HSRFKU9KNVZ;  QWEHTZHONZ:SZ  H  X'*H)Q+LS2)PG&+|  H1M 4KQ89430226
T+T@98%PL1*|T5_V  5@PNE4CS1)|EO=(  QDCF4@J OMA&&<$  L1DCCK4A 8@TE5MC  S1)|EO=( ¬*PN1G5  .&D  *R<89430227
T+T*42'( 8%TO9(|  D&<.E&<LE8@PC8@P  DK4A 2*R 1%PA8=L  R1MCN5>( 2)PS8@G  L4@PDE4CD1)¬R1;.  S&(* @.889430228
T+T=?OOC2L*|NO'(  )K1GBP17YD*|OG;/  ?1_|D&<E &D ):F"  F4@J OUA &A7Y$@$  L1DCC&DA G;/?1_|  D&<& $-489430229
T+T"D&DA G;/ 1)P  D&DA &D ): <BI"G  BD*$88'XY&<GGO*X  N&($R&<LE5'XE8>I  5@E-@U7C5*|LPMC  T5U  QRY89430230
THU N1'R 5_MCD*|  1D*LED*LR 0 7"3H  2&DB|TO  B4'"OH  X$O<BI"E D&  DO  ----------  -----  11@89430231
T+UEZ  AA+O  &LZ  A)-G-O*.C1<PF1@T  I4).L5(PO5'TR8>|  U9;$X:+XO@¬.3*|P  6'"T9MFA/;U_9E7_  <$GO :J-89430232
TFMFCLN5+PW9=L5'  ?¬51'&|@G-  ;-  GS+8DSZY  ----------  ----------  ----------  -----  3 M89430233
T DK-"0  ----------  ----------  ----------  ----------  ----------  -----  =C@89430234
**********  **********  **********  **********  *******  --------  --------  89430235
* SECTION 894 I S DESIGNED TO BE USED TO DEVELOP SYMPTOMS SO THA T THE *  --------  --------  89430236
* 3277/84/86/88 DISPLAY STATION OR PRINTER TROU BLE SHOOTING GUI DES *  --------  --------  89430237
* CAN BE USED T O DIAGNOSE DEVIC E PROBLEMS. *  --------  --------  89430238
* SECTION 894 S ENSE SWITCHES *  --------  --------  89430239
* SSW10 - S ELECT DEVICE/S F ROM CONSOLE SWIT CHES *  --------  --------  89430240
```

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OBJECT CARD LISTING

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96
*      SSW11 - R  ESTART ROUTINE 1   COMPLETELY                                            89430241
*      SSW12 - D  ISABLE 90 SEC. T   IMEOUT ON TEST 2   ATTERN ADVANCE                     89430242
*      SSW13 - D  ISPLAY HAS SELEC   TOR PEN BUT NO K   EYBOARD                            89430243
*      SSW14 - D  ISPLAY HAS NEITH   ER SELECTOR PEN    OR KEYBOARD                        89430244
*      SSW15 - E  NTER CHAR. FROM    DATA SW. IN ROUT   INE 04                             89430245
*      SSW20 - S  KIP TEST PATTERN   S OR DISPLAY ONL   Y THOSE SELECTED                    89430246
*             B   Y SSW 21 THRU 26   AS FOLLOWS:                                          89430247
*      SSW21 - D  O TEST PATTERN 1   IF SSW 20 IS ON                                       89430248
*      SSW22 - D  O TEST PATTERN 2   IF SSW 20 IS ON                                       89430249
*      SSW23 - D  O TEST PATTERN 3   IF SSW 20 IS ON                                       89430250
*      SSW24 - D  O TEST PATTERN 4   IF SSW 20 IS ON                                       89430251
*      SSW25 - D  O TEST PATTERN 5   IF SSW 20 IS ON                                       89430252
*      SSW26 - D  O TEST PATTERN 6   IF SSW 20 IS ON                                       89430253
*      SSW27 - S  KIP FULL BUFFER    PRINTOUT IN ROUT   INES 03 AND 04                     89430254
*      SSW28 - M  UST BE TURNED ON   IF CPU IS A MOD    EL 4 AND DEVICE   40 IS *        89430255
*             O   THER THAN A KEYB   OARDLESS 3277 MO   DEL 1 DISPLAY.                    89430256
*                                                                                         89430257
*  NOTE - SSW 10  AND 11 ARE AUTO   MATICALLY RESET    AFTER THEY ARE U   SED  *        89430258
*  SSW 20-26 ARE  PROVIDED AS A C   ONVENIENT WAY TO   SKIP TEST PATTE   RNS  *          89430259
*                                                                                         89430260
*  ROUTINE 13 IS  A MANUALLY SELE   CTED EXCERCISER,   BEFORE MANUALLY                    89430261
*  SELECTING ANY  ROUTINE, YOU MU   ST HAVE RUN AT L   EAST ROUTINE 01   THRU *          89430262
```

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OBJECT CARD LISTING

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96
*  02 FOR THE CU  RRENT DEVICE BEI   NG TESTED.                                          89430263
**********  **********  **********  **********  *******                                   89430264
EB/E*E7*=¬DC"PH$  ="7M&FI  I  C  F$  ASC  R A  SO  Q          08070608730  517764,D89430265
```

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89F1 DA SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           2        DECK  1
                           3        SEQ   0
   0A00                    4 WXYX   START X'0A00'
                           5        TREP
   0A00 89F1         0A01  6        DC    XL2'89F1'        S           P
   0A02 00           0A02  7        DC    XL1'0'          E           R
   0A03 00           0A03  8        DC    XL1'0'           C         E
   0A04 0000         0A05  9        DC    XL2'0'            T       F
   0A06 0A10         0A07 10        DC    AL2(RTN01)         I     A
   0A08 11DB         0A09 11        DC    AL2(LOG)            D   C
   0A0A 894000       0A0C 12 LINES  DC    XL3'894000'          N E
   0A0D 801000       0A0F 13 BSCA1  DC    XL3'801000'     BSCA-1 UDT INFO
                          14
                     0058 15 NOTRDY EQU   X'58'           TIO NOT READY
                     005D 16 ATTCHK EQU   X'5D'           TIO ATTACH CHECK
                     0058 17 SIOI   EQU   X'58'           SIO IMMEDIATE
                     0DFD 18 ABSCA1 EQU   X'0DFD'         ADDR OF BSCA-1 INTERRUPT ROUTINE
                     0DFF 19 ABSCA2 EQU   X'0DFF'         ADDR OF DA INTERRUPT ROUTINE
                     0001 20 XR1    EQU   1
                     0002 21 XR2    EQU   2
                     0008 22 ARR    EQU   8
                     0004 23 PSR    EQU   4
                     00A0 24 IAR2   EQU   X'A0'
                     0222 25 HALT   EQU   X'222'
                     021A 26 PRINT  EQU   X'21A'
                     021E 27 UNPACK EQU   X'21E'
                     008C 28 CAR    EQU   X'8C'
                     008A 29 TAR    EQU   X'8A'
                     0089 30 SAR    EQU   X'89'
                     0088 31 STATUS EQU   X'88'
                     008A 32 BUSY   EQU   X'8A'
                     008A 33 XMITR  EQU   X'8A'
                     0002 34 ENINTR EQU   X'02'
                     00C0 35 ENABLE EQU   X'C0'
                     0088 36 CNTRL  EQU   X'88'
                     0088 37 NORDUC EQU   X'88'
                     0008 38 OPT3   EQU   X'08'
                     0010 39 OPT4   EQU   X'10'
                     0020 40 OPT5   EQU   X'20'
                     0A00 41 PREF   EQU   X'A00'          ADDRESS OF SECTION PREFACE
                     0A0A 42 SUPER  EQU   X'A0A'          ADDR OF RETURN TO SUPERVISOR
                          43
                          43
                          43
   0A10 01           0A10 44 RTN01  DC    XL1'01'
   0A11 00           0A11 45        DC    XL1'00'
   0A12 FFFF         0A13 46        DC    XL2'FFFF'       LAST ROUTINE
                          47
   0A14 F3 58 80           48 START  SIO   X'80',SICI     DISABLE
   0A17 F3 58 C0           49        SIO   X'C0',SIOI     ENABLE ATTACHMENT
   0A1A 30 58 1515         50        SNS   BCNT,SIOI      SENSE 1ST WORD
   0A1E 0D 01 1515 1564    51        CLC   BCNT(2),X7200  CHECK FOR CORRECT DATA
   0A24 C0 01 0CE5         52        BNE   MICNL         ERROR IF NOT
   0A28 3C 02 1517         53        MVI   DVBCNT,X'02'   SET UP COUNT
   0A2C 3C F9 1516         54        MVI   DVBCNT-1,X'F9'
   0A30 30 58 1515         55 MICLP  SNS   BCNT,SIOI      SENSE CONTROL STORE WORD
   0A34 C1 5D 0CE5         56        TIO   MICNL,ATTCHK   ERROR IF ATTACHMENT CHECK
   0A38 0E 01 1517 1536    57        ALC   DVBCNT(2),ONE   INCREMENT COUNT
   0A3E C0 20 0A30         58        BNOL  MICLP          LOOP TILL DONE
                           59
   0A42 F3 58 80           60 NORDY  SIO   X'80',SIOI     DISABLE ATTACHMENT
   0A45 F3 58 E0           61        SIO   X'E0',SIOI     ENABLE MICROCONTROLLER
                           62
                     0A48  63        USING MICRON,XR1
   0A48 3D 00 1532         64 MICRON CLI   PASS1,X'00'    TEST FOR FIRST PASS
   0A4C F2 01 94           65        JNE   ALONE          JUMP IF NOT
   0A4F 38 01 0A0C         66        TBN   LINES,X'01'    IS KATAKANA FEATURE INSTALLED?
```


89F1 DA SYSTEN TEST MODULE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   0A53 F2 90 0C           67        JF    NOKAT          JUMP IF NOT
   0A56 0C 00 1401 16EA    68        MVC   DATAE(1),KATD1 CHANGE INVALID KATAKANA CHAR.
   0A5C 0C 01 13EC 16EC    69        MVC   DATAE-21(2),KATD2
   0A62 C2 01 0A48         70 NOKAT  LA    MICRON,XR1     LOAD XR1 FOR INDEXING
   0A66 SF 03 79 79        71        SLC   SET(4,XR1),SET(,XR1) CLEAR SET AREA
   0A6A 7C 1C 79           72        MVI   SET(,XR1),X'1C'  SET UP 1ST 3 BITS USED
   0A6D 0F 03 150A 150A    73        SLC   ONFLG(4),ONFLG   CLEAR THE ON FLAGS
   0A73 3C E0 1507         74        MVI   CNFLG-3,X'E0'    FORCE HI 3 BITS ON
   0A77 SC 01 40 78        75        MVC   TLIN+3(2,XR1),CONS(,XR1)  INITIALZE ADDR IN TBN INSTR.
   0A78 7C 08 3D           76        MVI   TLIN(,XR1),X'08' SET UP STARTING TEST BIT
                           77
   0A7E SC 00 3E 3D        78 NEXT   MVC   TLIN+1(1,XR1),TLIN(,XR1)  MOVE TEST BIT TO IMM. BYTE
   0A82 7C 38 3D           79 SETTBN MVI   TLIN(,XR1),X'38' SET TBN OP CODE
   0A85 38 00 0000         80 TLIN   TBN   *-*,*-*        TEST FOR LINES INSTALLED
   0A89 F2 90 05           81        JF    UPL            TEST NEXT IF NOT
   0A8C 1E 03 150A 79      82        ALC   CNFLG,SET(4,XR1) SET ON FLAGS IF INSTALLED
   0A91 SE 03 79 79        83 UPL    ALC   SET(4,XR1),SET(,XR1) SHIFT LINES LEFT 3 BITS
   0A95 SE 03 79 79        84        ALC   SET(4,XR1),SET(,XR1)
   0A99 SE 03 79 79        85        ALC   SET(4,XR1),SET(,XR1)
   0A9D 78 E0 76           86        TBN   SET-3(,XR1),X'E0'  ARE WE DONE YET
   0AA0 F2 10 21           87        JT    TALONE         JUMP IF SO
   0AA3 7C 02 3D           88        MVI   TLIN(,XR1),X'02' PLUG IN THE SHIFT STOPPER
   0AA6 SE 01 3E 3E        89 SHIFT  ALC   TLIN+1(2,XR1),TLIN+1(,XR1)  SHIFT RIGHT 1 BIT ROUT.
   0AAA C0 2C 0AA6         90        BNOL  SHIFT
   0AAE 78 80 3E           91        TBN   TLIN+1(,XR1),X'80' DID WE JUST GO TO THE NEXT BYTE
   0AB1 C0 90 0A7E         92        BF    NEXT           GO ON IF NOT
   0AB5 4E 01 40 1536      93        ALC   TLIN+3(2,XR1),ONE  INCREMENT THE TEST ADDRESS
   0ABA C0 87 0A82         94        B     SETTBN         GO SET THE TBN INSTR.
                           95
   0ABE 00000000     0AC1  96 SET    DC    XL4'0'
   0AC2 0A0B         0AC3  97 CONS   DC    AL2(LINES-1)
                           98
   0AC4 3C 80 1536         99 TALONE MVI   LINE,X'80'     INITIALIZE TO 1ST BIT
   0AC8 0C 01 1504 155C   100        MVC   CURDEV(2),PCLL  INITIALIZE DEVICE TO 40
   0ACE C2 02 1507        101        LA    ONFLG-3,XR2     POINT XR2 TO FLAGS
   0AD2 34 02 1566        102        ST    SVXR2,XR2       UPDATE XR2 STORAGE SPACE
   0AD6 3D 89 0A00        103        CLI   PREF,X'89'      TEST FOR RUNNING ALONE
   0ADA F2 81 06          104        JE    ALONE
   0ADD 0C 01 0DFF 1519   105        MVC   ABSCA2(2),AINT2 TELL BSCA-1 MY INT. ADDRESS
   0AE3 F3 88 C0          106 ALONE  SIO   ENABLE,CNTRL   ENABLE DA
   0AE6 0C 01 1502 14FE   107        MVC   CURRA(2),ADATA  INITIALIZE RIPPLE DATA POINTER
   0AEC 0C 01 152F 152B   108        MVC   ATABPT(2),AATAB INITIALIZE ADDRESS TABLE POINTER
   0AF2 35 A0 1519        109        L     AINT2,IAR2      LOAD INTERRUPT ADDRESS REG
                          110
   0AF6 3D 00 1532        111        CLI   PASS1,0         TEST FOR PASS 1
   0AFA 3C FF 1532        112        MVI   PASS1,X'FF'     SET PASS 1 COMPLETED ON
   0AFE F2 81 85          113        JE    GO              GO START MAIN PROGRAM IF 1ST PASS
   0B01 0E 01 1504 153E   114 UPDATE ALC   CURDEV(2),DEVINC UPDATE CURRENT DEVICE
   0B07 35 02 1566        115        L     SVXR2,XR2       RESTORE XR2 TO CURRENT VALUE
   0B0B 38 80 1536        116        TBN   LINE,X'80'      ARE WE AT 1ST LINE SELECT POSITION
   0B0F F2 90 08          117        JF    T2
   0B12 3A 80 1504        118        SBN   CURDEV,X'80'    CHANGE HI BITS TO C OR D
   0B16 3A 80 1503        119        SBN   CURDEV-1,X'80'
   0B1A 38 0A 1504        120 T2     TBN   CURDEV,X'0A'    ARE LOW BITS OF ADDR = A
   0B1E 39 05 1504        121        TBF   CURDEV,X'05'
   0B22 F2 90 08          122        JF    T3
   0B25 3B 80 1504        123        SBF   CURDEV,X'80'    CHANGE HI BITS TO 4 OR 5
   0B29 3B 80 1503        124        SBF   CURDEV-1,X'80'
   0B2D 38 01 1506        125 T3     TBN   LINE,X'01'      ARE WE AT THE LAST LINE BIT
   0B31 F2 90 0E          126        JF    T4
   0B34 E2 02 01          127        LA    1(,XR2),XR2     INCREMENT XR2 TO NEXT FLAG BYTE
   0B37 34 02 1566        128        ST    SVXR2,XR2       UPDATE XR2 STORAGE SPACE
   0B3B 3C 80 1536        129        MVI   LINE,X'80'      START AT BIT ZERO AGAIN
   0B3F F2 87 A1          130        J     ADDOK
   0B42 3D 5E 1504        131 T4     CLI   CURDEV,X'5E'    DID WE JUST DO LAST DEVICE
   0B46 F2 01 26          132        JNE   DEVOK
   0B49 0C 01 1504 155C   133        MVC   CURDEV(2),PCLL  REINITIALIZE BACK TO DEV 40
   0B4F 3C 80 1506        134        MVI   LINE,X'80'
```

89F1 DA SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0B53 C2 02 1587           135          LA    ONFLG-3,XR2         POINT XR2 BACK TO 1ST FLAG BYTE
    0B57 34 02 1566           136          ST    SVXR2,XR2           UPDATE XR2 STORAGE SPACE
    0B5B 3C F1 1531           137          MVI   WRTCMD,X'F1'        FORCE WRITE ONLY COMMAND
    0B5F 0D 03 159E 156A      138          CLC   PRTFLG(4),ONFLG     TEST FOR ALL DEVICES = PRINTERS
    0B65 F2 01 1E             139          JNE   GO                  GO ON IF NOT
    0B68 3C FF 1530           140          MVI   PFLG,X'FF'          FORCE PRINTERS TO PRINT
    0B6C F2 87 17             141          J     GO
                              142
    0B6F 3C 02 1505           143 DEVOK    MVI   LINE-1,X'02'        LOAD THE SHIFT STOPPER
    0B73 0E 01 1506 1506      144 SHIFTR   ALC   LINE(2),LINE        SHIFT LINE LEFT
    0B79 C0 20 0873           145          BNOL  SHIFTR              BRANCH TIL OFLO OCCURS
    0B7D 0C 00 1506 1505      146          MVC   LINE(1),LINE-1      LINE IS NOW SHIFTED RIGHT ONE BIT
    0B83 F2 87 5D             147          J     ADDOK               JUMP DO THIS DEVICE
                              148
                              149 *        UPDATE DEVICE, DATA ETC FOR NEXT PASS
                              150
    0B86 35 01 1502           151 GO       L     CURRA,XR1           GET RIPPLE DATA ADDR
    0B8A 1C 1C 1437 00        152          MVC   EXP6,0(29,XR1)      SET UP EXPECTED DATA
    0B8F 1C 1C 1474 00        153          MVC   RIPDAT,0(29,XR1)    SET UP TRANSMIT DATA
    0B94 0E 01 1502 1536      154          ALC   CURRA(2),ONE        UPDATE RIPPLE ADDR
    0B9A 0D 01 1502 1560      155          CLC   CURRA(2),DATEA      TEST FOR END OF DATA
    0BA0 F2 04 06             156          JNH   SETADR              JUMP IF NOT
    0BA3 0C 01 1502 14FE      157          MVC   CURRA(2),ADATA      INITIALIZE RIPPLE DATA POINTER
    0BA9 35 01 152F           158 SETADR   L     ATABPT,XR1          POINT XR1 TO TABLE
    0BAD 0D 01 152F 152B      159          CLC   ATABPT(2),AATAB     TEST FOR START OF TABLE
    0BB3 F2 01 04             160          JNE   NOTST               JUMP IF NOT
    0BB6 3C F5 1531           161          MVI   WRTCMD,X'F5'        SET WRITE CMD TO ERASE/WRITE
    0BBA 1C 01 1449 00        162 NOTST    MVC   WRTADR,0(2,XR1)     MOVE ADDR TO WRITE FIELD
    0BBF 1C 01 140B 02        163          MVC   EXP2,2(2,XR1)       MOVE ADDR TO EXP. CURSOR FIELD
    0BC4 1C 01 140E 02        164          MVC   EXP3,2(2,XR1)       MOVE ADDR TO EXP. 1ST SBA
    0BC9 1C 01 141A 04        165          MVC   EXP5,4(2,XR1)       MOVE ADDR TO EXP. 2ND SBA
    0BCE 0E 01 152F 1538      166          ALC   ATABPT(2),SIX       UPDATE TABLE POINTER
    0BD4 0D 01 152F 152D      167          CLC   ATABPT(2),AETAB     TEST FOR END
    0BDA F2 04 06             168          JNH   ADDOK               JUMP IF NOT
    0BDD 0C 01 152F 152B      169          MVC   ATABPT(2),AATAB     INITIALIZE ADDR TABLE POINTER
    0BE3 C2 01 1506           170 ADDOK    LA    LINE,XR1            POINT XR1 TO LINE POINTER
    0BE7 1C 00 0EDF 00        171          MVC   T1+1,0(1,XR1)       SET UP IMMEDIATE INSTRUCTIONS
    0BEC 1C 00 0EE6 00        172          MVC   SF1+1,0(1,XR1)       WITH NEW POINTER
    0BF1 1C 00 0F03 00        173          MVC   SN1+1,0(1,XR1)
    0BF6 1C 00 0C71 00        174          MVC   TP1+1,0(1,XR1)
    0BFB 1C 00 0C87 00        175          MVC   SP1+1,0(1,XR1)
    0C00 1C 00 0F7E 00        176          MVC   SN2+1,0(1,XR1)
    0C05 1C 00 0C3A 00        177          MVC   TM1+1,0(1,XR1)
    0C0A 1C 00 0F5E 00        178          MVC   SF2+1,0(1,XR1)
    0C0F 1C 00 0F4E 00        179          MVC   TN2+1,0(1,XR1)
                              180
                              180
    0C14 C0 87 021E           181          B     UNPACK              UNPACK THE DEVICE CODE
    0C18 01              0C18 182          DC    IL1'1'
    0C19 1504            0C1A 183          DC    AL2(CURDEV)
    0C1B 1455            0C1C 184          DC    AL2(DEVICE)
    0C1D 0C 01 1417 1455      185          MVC   EXP4(2),DEVICE      PUT UNPACKED DEVICE IN EXPECTED
    0C23 0C 01 124C 1455      186          MVC   LOGDEV(2),DEVICE    MOVE DEVICE TO LOG OUT FIELD
    0C29 0C 00 1408 1504      187          MVC   EXP1(1),CURDEV      MOVE CURRENT DEVICE TO EXP. FLD.
                              188
    0C2F 0F 01 1517 1517      189 SETPOL   SLC   CVBCNT(2),DVBCNT    SET BUSY COUNT TO ZERO
    0C35 C0 87 0E98           190          B     DOPOL               GO TO POLL SUBROUTINE
                              191
    0C39 B8 00 08             192 TM1      TBN   8(,XR2),*-*         TEST MAN. INT. ON THIS DEVICE
    0C3C C0 10 0B01           193          BT    UPDATE              GO TO NEXT DEVICE IF SO
    0C40 0C 01 14F5 155E      194 SELECT   MVC   SPFLD(2),SEL        SET UP TO SELECT THE DEVICE
    0C46 C0 87 0D23           195          B     DOSIO               GO SELECT
    0C4A 0008            0C4B 196          DC    AL2(ENQ-SELPOL)
    0C4C 1640            0C4D 197          DC    AL2(XMITE)
    0C4E 14F8            0C4F 198          DC    AL2(ENQ)
                              199
    0C50 4D 01 01 1548        200          CLC   1(2,XR1),ACK0       TEST FOR RESPONSE ACK 0
    0C55 F2 81 04             201          JE    WRTPRP              IF SO, GO GET READY TO WRITE PATT.
```


89F1 DA SYSTEM TEST MODULE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    0C58 C0 87 0E31           202          B     TRVI                GO TEST FOR RVI
                              203
                         0C5C 204 WRTPRP   EQU   *
    0C5C 06 50 122A 16E9      205          AZ    SLPC(6),DEC1(1)     ADD 1 TO SELECT COUNT
    0C62 0C 00 1445 1531      206          MVC   WRTFLD(1),WRTCMD    MOVE IN WRITE OR ERASE/WRITE
    0C68 3C 60 1409           207          MVI   EXP2-2,X'60'        SET DISPLAY NO AID CHAR
    0C6C 38 08 1446           208          SBF   WCC,X'08'           RESET THE START PRINT IN WCC
    0C70 B8 00 04             209 TP1      TBN   4(,XR2),*-*         TEST FOR THIS DEVICE A PRINTER
    0C73 F2 90 13             210          JF    WRTPAT              JUMP IF NOT
    0C76 3C E8 1409           211          MVI   EXP2-2,X'E8'        SET PRINTER NO AID CHARACTER
    0C7A 3D 00 1530           212          CLI   PFLG,0              TEST FOR NOT PRINTING
    0C7E F2 81 08             213          JE    WRTPAT              JUMP IF NOT PRINTING
    0C81 3A 08 1446           214          SBN   WCC,X'08'           SET THE START PRINT BIT IN WCC
    0C85 3C F5 1445           215          MVI   WRTFLD,X'F5'        FORCE AN ERASE/WRITE TO PRINTER
    0C89 C0 87 0023           216 WRTPAT   B     DOSIO               GO WRITE THE PATTERN
    0C8D 0035            0C8E 217          DC    AL2(EWRT-WRT)
    0C8F 1640            0C90 218          DC    AL2(XMITE)
    0C91 1478            0C92 219          DC    AL2(EWRT)
                              220
    0C93 4D 01 01 154A        221          CLC   1(2,XR1),ACK1       TEST FOR RESPONSE ACK 1
    0C98 C0 81 0CA0           222          BE    READ                GO READ IF SO
    0C9C C0 87 0E31           223          B     TRVI                GO TEST RVI, EOT OR WACK IF NOT
                              224
                         0CA0 225 READ     EQU   *
    0CA0 06 50 11FC 16E9      226          AZ    WRPC(6),DEC1(1)     ADD 1 TO WRITE COUNT
    0CA6 C0 87 0023           227          B     DOSIO               GO DO THE READ MODIFIED
    0CAA 0003            0CAB 228          DC    AL2(RDMODE-RDMOD)
    0CAC 1640            0CAD 229          DC    AL2(XMITE)
    0CAE 14FC            0CAF 230          DC    AL2(RDMODE)
                              231
    0CB0 7D E8 03             232          CLI   3(,XR1),X'E8'       DID WE GET A PRINTER AID?
    0CB3 F2 01 07             233          JNE   NOPAS1              JUMP IF NOT
    0CB6 BA 00 04             234 SP1      SBN   4(,XR2),*-*         SET PRINTER FLAG FOR THIS DEVICE
    0CB9 3C E8 1409           235          MVI   EXP2-2,X'E8'        SET EXPECTED AID FOR PRINTER
    0CBD 0D 40 1640 1442      236 NOPAS1   CLC   XMITE(65),EXP7      TEST CORRECT RESPONSE
    0CC3 F2 81 11             237          JE    ACKIT               JUMP IF CORRECT
    0CC6 4D 01 01 1542        238          CLC   1(2,XR1),EOT        WAS RESPONSE AN EOT?
    0CCB C0 81 0E5A           239          BE    REOT                BRANCH OUT IF SO
    0CCF 3C 08 1533           240          MVI   ERR,8               SET INCORRECT DATA CODE
    0CD3 C0 87 0F84           241          B     ERROR
                              242
                         0CD7 243 ACKIT    EQU   *
    0CD7 06 50 1213 16E9      244          AZ    RDPC(6),DEC1(1)     ADD 1 TO READ COUNT
    0CDD C0 87 0E75           245          B     GOACK               SEND ACK 1 TO DEVICE
    0CE1 C0 87 0B01           246          B     UPDATE              GO TO NEXT DEVICE
                              247
                              247
    0CE5 3C 0F 1533           248 MICNL    MVI   ERR,X'0F'           SET ERROR CODE
    0CE9 F3 08 80             249          SIO   X'80',SIOX          RESET ATTACHMENT CHECK
    0CEC C0 87 0F84           250          B     ERROR
                              251 ***********************************
                              252 *  MANUAL INTERVENTION ROUTINES  ****************************************
                              253 ***********************************
                              254
    0CF0 C0 87 0023           255 MANIN    B     DOSID               GO WRITE PATTERN
    0CF4 0039            0CF5 256          DC    AL2(MANP1E-MANP1S)
    0CF6 1640            0CF7 257          DC    AL2(XMITE)
    0CF8 1482            0CF9 258          DC    AL2(MANP1E)
                              259
    0CFA 4D 01 01 154A        260          CLC   1(2,XR1),ACK1       CHECK FOR ACK 1 RETURN
    0CFF C0 81 0B01           261          BE    UPDATE              OKAY IF SO, LEAVE HIM TO PLAY
    0D03 C0 87 0E31           262          B     TRVI                GO CHECK WHAT HAPPENED IF NOT
                              263
                              263
    0D07 1C 13 14DA 1C        264 MANIN1   MVC   RECMSG,28(20,XR1)   MOVE IN MESSAGE
    0D0C C0 87 0023           265          B     DOSIO               GO ADD TO SCREEN
    0D10 003C            0D11 266          DC    AL2(MANP2E-MANP2S)
    0D12 1640            0D13 267          DC    AL2(XMITE)
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0D14 14EF             0D15  268        DC    AL2(MANP2E)
                               269
   0D16 4D 01 01 154A          270        CLC   1(2,XR1),ACK1       CHECK FOR ACK 1 RETURN
   0D1A C0 81 0B01             271        BE    UPDATE              OKAY IF SO, LEAVE HIM TIL PF3 HIT
   0D1F C0 87 0E31             272        B     TRVI                GO CHECK WHAT HAPPEND IF NOT
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               274 **********************
                               275 *  DO SIO SUBROUTINE  ********************************************
                               276 **********************
                               277
   0D23 34 06 0DEF             278 DOSIO  ST    DOSIOR+3,ARR         STORE RETURN ADDRESS
   0D27 34 02 0DEB             279        ST    REST2+3,XR2          STORE XR2
   0D2B 35 01 0DEF             280        L     DOSIOR+3,XR1         POINT XR1 AT PARAMETERS
   0D2F 0C 13 1262 1263        281        MVC   LOGMSG(20),MSGBLK    BLANK OUT THE MESSAGE FIELD
   0D35 0C 01 124C 1465        282        MVC   LOGDEV(2),DEVICE     INSERT THE DEVICE IN MESSAGE
   0D3B 0C 07 1262 168F        283        MVC   LOGMSG(8),NOERR      MOVE IN NO ERROR MESSAGE
   0D41 0C 03 1272 1562        284        MVC   LOGST(4),XXXX        'X' OUT DATA
   0D47 0C 03 127C 1562        285        MVC   LOGCAR(4),XXXX
   0D4D 0C 03 1286 1562        286        MVC   LOGTAR(4),XXXX
   0D53 0C 03 1290 1562        287        MVC   LOGSAR(4),XXXX
   0D59 0C 01 151F 151D        288        MVC   LTAR(2),LCAR         PUT INITIAL CAR INTO TAR LOAD AREA
   0D5F 1E 01 151F 01          289        ALC   LTAR,1(2,XR1)        ADD IN THE DISPLACEMENT
   0D64 0E 01 151F 1536        290        ALC   LTAR(2),ONE          ADD 1 MORE
   0D6A 1C 01 1521 03          291        MVC   LSAR,3(2,XR1)        MOVE IN THE SAR ADDRESS
   0D6F C2 02 1600             292        LA    XMITRC,XR2           PUT ADDR OF TRANSMIT/RECEIVE FIELD
                               293 *                                 INTO XR2
   0D73 1C 01 0D8C 05          294        MVC   MVDATA+4,5(2,XR1)    MOVE IN DATA ADDRESS
   0D78 1C 00 0D89 01          295        MVC   MVDAT4+1,1(1,XR1)    MOVE IN THE LENGTH
   0D7D 1C 00 0D8A 01          296        MVC   MVDATA+2,1(1,XR1)    MOVE IN THE DISPLACEMENT
   0D82 0C 40 1640 1641        297        MVC   FILL-1(65),FILL      ZERO THE WHOLE XMIT/RECEIVE FIELD
   0D88 8C 00 00 0000          298 MVDATA MVC   *-*(*-*,XR2),*-*     MOVE XMIT DATA TO XMIT/REC. FIELD
   0D8D 3C C0 1514             299        MVI   BCNT-1,X'C0'         RESET THE BUSY COUNTER
   0D91 3C FF 1513             300        MVI   INTFLG,X'FF'         SET INT FLG TO 'NO INTERRUPT'
   0D95 3C 00 1533             301        MVI   ERR,0                SET ERROR FLAG TO ZERO
   0D99 F3 88 02               302        SIO   ENINTR,CNTRL         SIO TO ENABLE INTERRUPTS TO CATCH
                               303 *                                   ANY ATTACHMENT CHECKS
   0D9C 31 8C 151D             304        LIO   LCAR,CAR             LOAD THE CAR
   0DA0 31 8A 151F             305        LIO   LTAR,TAR             LOAD THE TAR
   0DA4 31 89 1521             306        LIO   LSAR,SAR             LOAD THE SAR
   0DA8 C1 56 0E15             307 TSTRDY TIO   DROPED,NOTRDY        CHECK MICROCONTROLLER STILL RUNNING
                               308
   0DAC F3 8A 02               309        SIO   ENINTR,XMITR         SIO TO TRANSMIT/REC., ENABLE INTR.
                               310
   0DAF C1 8A 0DF0             311 BUSYB  TIO   EXIT,BUSY            TEST BUSY, MAYBE GO TO SUPERVISOR
   0DB3 30 8C 1523             312        SNS   SCAR,CAR             SENSE THE CAR
   0DB7 30 8A 1525             313        SNS   STAR,TAR             SENSE THE TAR
   0DBB 30 89 1527             314        SNS   SSAR,SAR             SENSE THE SAR
   0DBF 30 88 1529             315        SNS   SSTAT,STATUS         SENSE THE STATUS
   0DC3 35 01 151F             316        L     LTAR,XR1             POINT XR1 TO RECEIVE FIELD
   0DC7 3D 00 1513             317        CLI   INTFLG,0             DID THE INTERRUPT OCCUR YET?
   0DCB F2 81 04               318        JE    TSTERR               JUMP IF SO
   0DCE 3C C7 1533             319        MVI   ERR,X'07'            SET NO INTERRUPT ERROR
   0DD2 3D 00 1533             320 TSTERR CLI   ERR,0                TEST FOR NO ERROR
   0DD6 C0 01 0F84             321        BNE   ERROR                BRANCH IF ERROR OCCURRED
   0DDA 3D 89 0A00             322        CLI   PREF,X'89'           TEST FOR RUNNING ALONE
   0DDE C0 01 0A0A             323        BNE   SUPER                GO TO SUPERVISOR IF NOT
   0DE2 0E 01 0DBF 1538        324        ALC   DOSIOR+3(2),SEK      UPDATE RETURN ADDRESS
   0DE8 C2 02 0000             325 REST2  LA    *-*,XR2              RESTORE XR2
   0DEC C0 87 0000             326 DOSIOR B     *-*                  RETURN TO USER
                               327
                               327
   0DF0 0E 01 1515 1536        328 EXIT   ALC   BCNT(2),ONE          ADD TO BUSY COUNTER
   0DF6 C0 A0 0E0D             329        BOL   ESYERR               ERROR AFTER ABOUT 1 SEC.
   0DFA 3D 00 1513             330        CLI   INTFLG,0             DID AN INTERRUPT OCCUR YET?
   0DFE F2 81 24               331        JE    GOTIT                JUMP IF SO
   0E01 3D 89 0A00             332 GOSUPR CLI   PREF,X'89'           TEST FOR 89F THE ONLY MODULE
   0E05 C0 01 0A0A             333        BNE   SUPER                RETURN TO SUPERVISOR IF NOT
   0E09 C0 87 0DAF             334        B     BUSYB                RETURN TO TEST STILL BUSY
                               335
   0E0D 3C C2 1533             336 BSYERR MVI   ERR,X'02'            SET BUSY TOO LONG INDICATION
   0E11 C0 87 0F84             337        B     ERROR                GO TO ERROR ROUTINE
                               338
   0E15 3D 00 1533             339 DROPED CLI   ERR,0                DID AN ERROR OCCUR
   0E19 C0 01 0F84             340        BNE   ERROR                IF SO, GO TO ERROR ROUT.
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E1D 3C 0A 1533            341        MVI   ERR,X'0A'       SET ATTACH. NOT READY ERROR
   0E21 C0 87 0F84            342        B     ERROR
                              343
   0E25 3D 00 1533            344 GOTIT  CLI   ERR,0           DID AN ERROR OCCUR YET?
   0E29 C0 81 0E81            345        BE    GOSUPR          IF NOT, GO ON
   0E2D C0 87 0F84            346        B     ERROR           GO TO ERROR
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           348 ***********************************************
                           349 *  TEST RVI, WACK OR EOT RESPONSE SUBROUTINE ***********************
                           350 ***********************************************
                           351
   0E31 34 06 0E74         352 TRVI   ST    TRVIR+3,ARR          STORE RETURN ADDRESS
   0E35 4D 01 01 1544      353        CLC   1(2,XR1),WACK        TEST FOR WACK REC'D
   0E3A C0 81 0801         354        BE    UPDATE               IF SO, GO TO NEXT DEVICE
   0E3E 4D 01 01 1546      355        CLC   1(2,XR1),RVI         WAS RESPONSE RVI?
   0E43 F2 81 18           356        JE    RRVI                 JUMP IF SO
   0E46 4D 01 01 1542      357        CLC   1(2,XR1),EOT         TEST FOR EOT REC'D
   0E4B F2 81 0C           358        JE    RECT                 JUMP IF SO
                           359
   0E4E 3C C4 1533         360        MVI   ERR,4                SET UNEXPECTED RESPONSE
   0E52 C0 87 0F84         361        B     ERROR
   0E56 C0 87 0801         362        B     UPDATE               GO TO NEXT DEVICE
                           363
   0E5A 3C 10 1533         364 RECT   MVI   ERR,X'10'           SET ERROR CODE
   0E5E F2 87 04           365        J     COPS1                GO TO ERROR, POLL & UPDATE
                           366
   0E61 3C 20 1533         367 RRVI   MVI   ERR,X'20'           SET THE ERROR CODE
   0E65 C0 87 0F84         368 COPS1  B     ERROR
   0E69 C0 87 0E98         369        B     DOPOL                GO GET THE STATUS
   0E6D C0 87 0801         370        B     UPDATE               GO TO NEXT DEVICE
                           371
   0E71 C0 87 0000         372 TRVIR  B     *-*                  RETURN TO USER
                           373
                           374 *************************
                           375 *  SEND ACK 1 SUBROUTINE  ***************************************
                           376 *************************
                           377
   0E75 34 08 0E9A         378 GOACK  ST    GOACKR+3,ARR         STORE RETURN ADDRESS
   0E79 C0 87 0D23         379        B     DOSIO                SEND ACK 1 TO DEVICE
   0E7D 0001               360        DC    AL2(ACK1-ACK1+1)     0E7E
   0E7F 1640               361        DC    AL2(XMITE)           0E80
   0E81 154A               362        DC    AL2(ACK1)            0E82
                           383
   0E83 4D 01 01 1542      384        CLC   1(2,XR1),EOT         TEST RESPONSE = EOT
   0E88 F2 81 0C           385        JE    GOACKR               EXIT IF SO, ALL OKAY
   0E8B 3C 04 1533         386        MVI   ERR,4                SET UNEXPECTED RESPONSE
   0E8F C0 87 0F84         387        B     ERROR
   0E93 C0 87 0801         388        B     UPDATE               GO TO NEXT DEVICE
                           389
   0E97 C0 87 0000         390 GOACKR B     *-*                  RETURN TO USER
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              392 ************************
                              393 *  DO POLL SUBROUTINE  ***************************************************
                              394 ************************
                              395
   0E9B 34 08 0F67            396 DOPOL  ST    DOPOLR+3,ARR          STORE RETURN ADDRESS
   0E9F 0C 01 14F5 155C       397        MVC   SPFLD(2),POLL         SET UP TO POLL
   0EA5 0C 01 14F7 1504       398        MVC   PSDEV(2),CURDEV       SET UP THE DEVICE
   0EAB 0E 01 1517 1526       399 RPTPOL ALC   DVBCNT(2),ONE         ADD TO DEVICE BUSY COUNTER
   0EB1 38 20 1516            400        TBN   DVBCNT-1,X'20'        TEST APPROX 20 SEC GONE BY
   0EB5 F2 10 B8              401        JT    DVBSY                 IF SO, DEVICE IS HUNG BUSY
   0EB8 06 70 1241 16E9       402        AZ    PLPC(8),DEC1(1)       ADD 1 TO POLL COUNT
                              403
   0EBE C0 87 0D23            404        B     DOSIO                 GO TO I/O SUBROUTINE & POLL
   0EC2 0008            0EC3  405        DC    AL2(ENQ-SELPOL)       LENGTH OF MESSAGE
   0EC4 1640            0EC5  406        DC    AL2(XMITE)            STOP ADDR
   0EC6 14F8            0EC7  407        DC    AL2(ENQ)              MESSAGE ADDR
                              408
   0EC8 7D 37 00              409        CLI   0(,XR1),X'37'         TEST FOR RESPONSE = EOT
   0ECB F2 81 96              410        JE    DOPOLR                DEVICE OKAY IF SO, RETURN TO USER
   0ECE 4D 02 02 1555         411        CLC   2(3,XR1),STATR        TEST FOR STATUS RESPONSE
   0ED3 F2 C1 55              412        JNE   TAID                  GO TEST FOR AID IF NOT
   0ED6 4D 01 07 1540         413        CLC   7(2,XR1),IR           TEST RESPONSE = INT. REQ.
   0EDB F2 01 1C              414        JNE   TSTDE                 IF NOT GO TEST FOR DEVICE END
   0EDE BB C0 00              415 T1     TBN   0(,XR2),*-*           TEST LINE FORMERLY AVAILABLE
   0EE1 C0 90 0B01            416        BF    UPDATE                IF NOT GO UPDATE TO NEXT DEVICE
   0EE5 BB 00 00              417 SF1    SBF   0(,XR2),*-*           RESET THE ON BIT
   0EE8 0C 00 1533 1504       418        MVC   ERR(1),CURDEV         PUT DEVICE IN ERROR CODE
   0EEE C0 87 0F84            419 OOPS   B     ERROR
   0EF2 C0 87 0E75            420        B     GOACK                 GO ACKNOWLEDGE STATUS
   0EF6 C0 87 0B01            421        B     UPDATE                GO TO NEXT DEVICE
                              422
                              423
   0EFA 4D 01 07 154E         424 TSTDE  CLC   7(2,XR1),DE            TEST FOR DEVICE END STATUS
   0EFF F2 01 06              425        JNE   TSTBY                 IF NOT GO TEST BUSY
   0F02 BA 00 00              426 SN1    SBN   0(,XR2),*-*           SET THE AVAILABLE BIT ON
   0F05 F2 87 58              427        J     SACK                  GO ACKNOWLEDGE STATUS & RETURN
   0F08 4D 01 07 1552         428 TSTBY  CLC   7(2,XR1),DB            WAS THE DEVICE BUSY?
   0F0C C0 81 0EAB            429        BE    RPTPOL                IF SO, GO POLL AGAIN
   0F11 4D 01 07 1550         430        CLC   7(2,XR1),CC           TEST FOR CONTROL CHECK
   0F16 C0 81 0EE5            431        BE    SF1                   IF SO, GO SET LINE UNAVAILABLE
   0F1A 4D 01 07 154C         432        CLC   7(2,XR1),IRDE         TEST FOR IR, DE
   0F1F C0 81 0EE5            433        BE    SF1                   IF SO, GO SET LINE UNAVAILABLE
   0F23 3C 04 1533            434 WHAT   MVI   ERR,4                 SET UP UNEXPECTED RESPONSE
   0F27 C0 87 0EEE            435        B     OOPS                  GO TO ERROR ROUTINE
                              436
   0F2B 4D 02 02 1408         437 TAID   CLC   2(3,XR1),EXP1         TEST FOR AID KEY DEPRESSED
   0F30 F2 01 41              438        JNE   TTSTR                 IF NOT, CHECK TEST REQ.
   0F33 7D 6C 03              439        CLI   3(,XR1),X'6C'         TEST FOR PA 1 KEY
   0F36 F2 01 04              440        JNE   TPF2                  JUMP IF NOT
   0F39 3C FF 1530            441        MVI   PFLG,X'FF'            SET PRINT FLAG ON
   0F3D 7D 6E 03              442 TPF2   CLI   3(,XR1),X'6E'         TEST FOR PA 2 KEY
   0F40 F2 C1 04              443        JNE   TENT                  JUMP IF NOT
   0F43 3C 00 1530            444        MVI   PFLG,0                RESET PRINT FLAG IF SO
   0F47 7D 7D 03              445 TENT   CLI   3(,XR1),X'7D'         WAS ENTER KEY PUSHED?
   0F4A F2 01 0A              446        JNE   TCLR                  JUMP IF NOT
   0F4D BB 00 08              447 TN2    TBN   8(,XR2),*-*           TEST MAN. INT. ON THIS DEV.
   0F50 C0 10 0D07            448        BT    MANIN1                GO TO MANUAL INT. ROUT. IF SO
   0F54 F2 87 09              449        J     SACK                  IF NOT, SEND ACK
   0F57 7D 6D 03              450 TCLR   CLI   3(,XR1),X'6D'         TEST FOR CLEAR
   0F5A F2 01 03              451        JNE   SACK                  JUMP IF NOT
   0F5D BB 00 08              452 SF2    SBF   8(,XR2),*-*           RESET MANUAL INT. BIT
   0F60 C0 87 0E75            453 SACK   B     GOACK                 GO SEND ACK
                              454
   0F64 C0 87 0000            455 DOPOLR B     *-*                   RETURN TO USER
                              456
   0F68 3C 09 1533            457 DVBSY  MVI   ERR,9                 SET DEVICE HUNG BUSY
   0F6C C0 87 0F84            458        B     ERROR
   0F70 C0 87 0B01            459        B     UPDATE GO TO NEXT DEVICE
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0F74 4D 02 02 1558         459 TTSTR  CLC   2(3,XR1),TSTREQ        TEST FOR TEST REQUEST PUSHED
   0F79 C0 01 0F23            460        BNE   WHAT                  BRANCH IF NOT
   0F7D BA 00 08              461 SN2    SBN   8(,XR2),*-*           SET MANUAL INT. FLAG ON THIS DEVICE
   0F80 C0 87 0CF0            462        B     MANIN                 GO TO MANUAL INTERVENTION ROUTINE
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              464 *****************************************
                              465 *  ERROR FORMATTING & PRINTOUT ROUTINE ***************************************
                              466 *****************************************
                              467
 0F84 34 08 1158              468 ERROR  ST    ERRORR+3,ARR          STORE RETURN
 0F88 0C 01 132A 13C2         469        MVC   EARLY(2),FFFF         INITIALIZE FOR NO EXP. PRINTOUT
 0F8E 0C 00 1137 1533         470        MVC   ERRHLT(1),ERR         FILL IN HALT CODE
 0F94 3D 01 1533              471        CLI   ERR,1                 TEST FOR UNIT CHECK
 0F98 F2 01 09                472        JNE   TERR2
 0F9B 0C 11 1262 15D1         473        MVC   LOGMSG(18),UNITNR     INSERT UNIT CHECK MESSAGE
 0FA1 F2 87 E0                474        J     GETSET
 0FA4 3D 02 1533              475 TERR2  CLI   ERR,2                 TEST FOR HUNG BUSY
 0FA8 F2 01 09                476        JNE   TERR3
 0FAB 0C 10 1262 1670         477        MVC   LOGMSG(17),HBUSY      INSERT HUNG BUSY MESSAGE
 0FB1 F2 87 D0                478        J     GETSET
 0FB4 3D 03 1533              479 TERR3  CLI   ERR,3                 TEST FOR INT PND ERROR
 0FB8 F2 01 09                480        JNE   TERR4
 0FBB 0C CD 1262 168F         481        MVC   LOGMSG(14),INTPND     INSERT INT PND ERROR MSG
 0FC1 F2 87 C0                482        J     GETSET
 0FC4 3D 04 1533              483 TERR4  CLI   ERR,4                 TEST FOR UNEXPECTED STATUS
 0FC8 F2 01 09                484        JNE   TERR5                 JUMP IF NOT
 0FCB 0C 12 1262 1692         485        MVC   LOGMSG(19),UNEXP      MOVE IN MESSAGE
 0FD1 F2 87 B0                486        J     GETSET
 0FD4 3D C5 1533              487 TERR5  CLI   ERR,5                 TEST FOR ATTACHMENT CHECK
 0FD8 F2 01 09                488        JNE   TERR6
 0FDB 0C 0F 1262 16E1         489        MVC   LOGMSG(16),ATTMSG     INSERT ATT CHECK MESSAGE
 0FE1 F2 87 A0                490        J     GETSET
 0FE4 3D 06 1533              491 TERR6  CLI   ERR,6                 TEST FOR ITB ERROR
 0FE8 F2 01 09                492        JNE   TERR7
 0FEB 0C 0C 1262 15FE         493        MVC   LOGMSG(13),ITBMSG     INSERT ITB ERROR MESSAGE
 0FF1 F2 87 90                494        J     GETSET
 0FF4 3D 07 1533              495 TERR7  CLI   ERR,7                 TEST FOR NO INTERRUPT
 0FF8 F2 01 09                496        JNE   TERR8
 0FFB 0C 0B 1262 15F1         497        MVC   LOGMSG(12),NOINTR     INSERT NO INTERRUPT MESSAGE
 1001 F2 87 80                498        J     GETSET
 1004 3D 08 1533              499 TERR8  CLI   ERR,8                 TEST FOR DATA MISCOMPARE
 1008 F2 01 0F                500        JNE   TERR9
 1008 0C 0E 1262 167F         501        MVC   LOGMSG(15),MISDAT     INSERT MISCOMPARE MESSAGE
 1011 0C 01 132A 155A         502        MVC   EARLY(2),H8045        INSERT CONSTANT TO CAUSE EXP DATA
                              503 *                                   TO PRINT
 1017 F2 87 6A                504        J     GETSET
 101A 3D 09 1533              505 TERR9  CLI   ERR,9                 TEST FOR DEVICE HUNG BUSY
 101E F2 01 09                506        JNE   TERR0A                JUMP IF NOT
 1021 0C 0D 1262 1687         507        MVC   LOGMSG(14),DVBMSG     MOVE IN DEVICE BUSY MESSAGE
 1027 F2 87 5A                508        J     GETSET
 102A 3D 0A 1533              509 TERR0A CLI   ERR,X'0A'             TEST FOR ATTACH. NOT READY
 102E F2 01 09                510        JNE   TERR0B                JUMP IF NOT
 1031 0C 10 1262 158F         511        MVC   LOGMSG(17),ATTNOR     MOVE IN MESSAGE
 1037 F2 87 4A                512        J     GETSET
 103A 3D 0B 1533              513 TERR0B CLI   ERR,X'0B'             TEST FOR UNEXPECTED INTERRUPT
 103E F2 01 09                514        JNE   TERR0F                JUMP IF NOT
 1041 0C 13 1262 16C3         515        MVC   LOGMSG(20),UNXINT     MOVE IN MESSAGE
 1047 F2 87 3A                516        J     GETSET
 104A 3D 0F 1533              517 TERR0F CLI   ERR,X'0F'             TEST MICRO CODE NOT LOADED
 104E F2 01 09                518        JNE   TERR20
 1051 0C 14 1262 16E8         519        MVC   LOGMSG(21),MICNLN     MOVE IN MESSAGE
 1057 F2 87 2A                520        J     GETSET
 105A 3D 20 1533              521 TERR20 CLI   ERR,X'20'             TEST FOR RVI TO SELECT
 105E F2 01 09                522        JNE   TERR40                JUMP IF NOT
 1061 0C 0C 1262 169F         523        MVC   LOGMSG(13),RVIMSG     MOVE IN MESSAGE
 1067 F2 87 1A                524        J     GETSET
 106A 3D 10 1533              525 TERR40 CLI   ERR,X'10'             TEST FOR EOT TO CMD
 106E F2 01 09                526        JNE   DEV                   JUMP IF NOT
 1071 0C 09 1262 16A9         527        MVC   LOGMSG(10),EOTMSG     MOVE IN MESSAGE
 1077 F2 87 0A                528        J     GETSET
 107A 3B 80 1137              529 DEV    SBF   ERRHLT,X'80'          CHANGE HI CODE FROM C OR D TO 4 OR 5
 107E 0C 13 1262 15E5         530        MVC   LOGMSG(20),NOTAVL     INSERT NOT AVAILABLE MESSAGE
                              531
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89F1 DA SYSTEM TEST MODULE

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1084 C0 87 021E              532 GETSET B     UNPACK              GO UNPACK CAR
 1088 02                1088  533        DC    IL1'2'
 1089 1523              1084  534        DC    AL2(SCAR)
 108B 127C              108C  535        DC    AL2(LCGCAR)
                              536
 108D C0 87 021E              537        B     UNPACK              GO UNPACK TAR
 1091 02                1091  538        DC    IL1'2'
 1092 1525              1093  539        DC    AL2(STAR)
 1094 1286              1095  540        DC    AL2(LOGTAR)
                              541
 1096 C0 87 021E              542        B     UNPACK              GO UNPACK SAR
 109A 02                109A  543        DC    IL1'2'
 109B 1527              109C  544        DC    AL2(SSAR)
 109D 1290              109E  545        DC    AL2(LOGSAR)
                              546
 109F C0 87 021E              547        B     UNPACK              GO UNPACK STATUS
 10A3 02                10A3  548        DC    IL1'2'
 10A4 1529              10A5  549        DC    AL2(SSTAT)
 10A6 1272              10A7  550        DC    AL2(LOGST)
                              551
 10A8 C0 87 021E              552        B     UNPACK              GO UNPACK 1ST HALF XMIT/REC
 10AC 1E                10AC  553        DC    IL1'30'
 10AD 161D              10AE  554        DC    AL2(XMITE-35)
 10AF 12D7              10B0  555        DC    AL2(LOGXR1)
                              556
 10B1 C0 87 021E              557        B     UNPACK              GO UNPACK 2ND HALF XMIT/REC
 10B5 23                10B5  558        DC    IL1'35'
 10B6 1640              10B7  559        DC    AL2(XMITE)
 10B8 1328              10B9  560        DC    AL2(LOGXR2)
                              561
 10BA C0 87 021E              562        B     UNPACK              GO UNPACK 1ST HALF EXP. FIELD
 10BE 1E                10BE  563        DC    IL1'30'
 10BF 141F              10C0  564        DC    AL2(EXP7-35)
 10C1 136F              10C2  565        DC    AL2(LOGEX3)
                              566
 10C3 C0 87 C21E              567        B     UNPACK              GO UNPACK 2ND HALF EXP. FIELD
 10C7 23                10C7  568        DC    IL1'35'
 10C8 1442              10C9  569        DC    AL2(EXP7)
 10CA 13C0              10CB  570        DC    AL2(LOGEX2)
                              571
 10CC 3D 89 0A00              572        CLI   PREF,X'89'          TEST RUNNING WITH SUPERVISOR
 10D0 F2 01 5F                573        JNE   STOPIT              JUMP UNLESS STAND ALONE
                              574
 10D3 0C 00 10E2 1533         575        MVC   HEAD(1),ERR         MOVE ERROR TO HEADER
 10D9 C0 87 021A              576        B     PRINT               GO PRINT 1ST MESSAGE
 10DD C2                10DD  577        DC    XL1'C2'
 10DE 20                10DE  578        DC    IL1'32'
 10DF 1263              10E0  579        DC    AL2(MSGBLK)
 10E1 8000              10E2  580 HEAD   DC    XL2'8000'
 10E3 C0 87 021A              581        B     PRINT               PRINT WRITE COUNT
 10E7 81                10E7  582        DC    XL1'81'
 10E8 15                10E8  583        DC    IL1'21'
 10E9 11FC              10EA  584        DC    AL2(WRPC)
 10EB C0 87 021A              585        B     PRINT               PRINT READ COUNT
 10EF 81                10EF  586        DC    XL1'81'
 10F0 15                10F0  587        DC    IL1'21'
 10F1 1213              10F2  588        DC    AL2(RDPC)
 10F3 C0 87 021A              589        B     PRINT               PRINT SELECT COUNT
 10F7 81                10F7  590        DC    XL1'81'
 10F8 15                10F8  591        DC    IL1'21'
 10F9 122A              10FA  592        DC    AL2(SLPC)
 10FB C0 87 021A              593        B     PRINT               PRINT POLL COUNT
 10FF 82                10FF  594        DC    XL1'82'
 1100 15                1100  595        DC    IL1'21'
 1101 1241              1102  596        DC    AL2(RLPC)
 1103 C0 87 021A              597        B     PRINT               GO PRINT CAR. TAR. SAR & STATUS
 1107 82                1107  598        DC    XL1'82'
 1108 28                1108  599        DC    IL1'43'
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1109 1290             110A  600         DC    AL2(LOGSAR)
   1109 C0 87 021A             601         B     PRINT
   110F 81               110F  602         DC    XL1'81'
   1110 45               1110  603         DC    IL1'69'
   1111 12D7             1112  604         DC    AL2(LOGXR1)
   1113 C0 87 021A             605         B     PRINT
   1117 86               1117  606         DC    XL1'86'
   1118 4F               1118  607         DC    IL1'79'
   1119 1326             111A  608         DC    AL2(LOGXR2)
                               609
   1118 3D FF 132A             610         CLI   EARLY,X'FF'
   111F F2 81 10               611         JE    STOPIT
   1122 C0 87 021A             612         B     PRINT
   1126 81               1126  613         DC    XL1'81'
   1127 45               1127  614         DC    IL1'69'
   1128 136F             1129  615         DC    AL2(LOGEX1)
   112A C0 87 021A             616         B     PRINT
   112E 86               112E  617         DC    XL1'86'
   112F 4F               112F  618         DC    IL1'79'
   1130 13C0             1131  619         DC    AL2(LOGEX2)
                               620
   1132 C0 87 0222             621 STOPIT B      HALT
   1136 8900             1137  622 ERRHLT DC     XL2'8900'
   1138 3D 89 0A00             623 DROP  CLI     PREF,X'89'
   113C C0 01 0A0A             624       BNE     SUPER
   1140 3D 0F 1533             625       CLI     ERR,X'0F'
   1144 C0 81 1138             626       BE      DROP
   1148 3D 05 1533             627       CLI     ERR,5
   114C C0 81 0A14             628       BE      START
   1150 3D 01 1533             629       CLI     ERR,1
   1154 C0 81 0A14             630       BE      START
                               631
   1158 C0 87 0000             632 ERRORR B      *-*
```

GO PRINT XMIT/REC FIELD

TO PRINTING EXPECTED DATA
JUMP IF NOT
PRINT EXPECTED DATA

GO HALT
*****HALT CODE GETS FILLED IN*******
TEST FOR STAND ALONE OPERATION
RETURN TO SUPERVISOR IF NOT
TEST FOR MICRO CODE NOT LOADED
HANG IF SO, TIL LOADED
TEST FOR ATTACHMENT CHECK
RESTART IF SO
TEST FOR NOT READY/UNIT CHECK
RESTART IF SO

RETURN TO USER


```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               634 ************************
                               635 *  INTERRRUPT ROUTINE  ***************************************************
                               636 ************************
                               637
   115C 34 01 11A4             638 INT2  ST    X1+3,XR1          SAVE XR1
   1160 34 02 11A8             639       ST    X2+3,XR2          SAVE XR2
   1164 34 04 1518             640       ST    PSRW,PSR          SAVE PSR
   1168 35 04 1535             641       L     ZERO,PSR          INITIALIZE PSR TO ZERO
   116C C1 8D 11C4             642 TSTATT TIO  ERRATC,ATTCHK     TEST FOR ATTACHMENT CHECK
   1170 C1 89 118A             643       TIO   GOON,X'89'        TEST FOR DA OP END INTERRUPT
   1174 36 20 0ABE             644       TBN   BSCA1-1,X'20'     TEST FOR BSCA-1 PRESENT
   1178 F2 10 07               645       JT    BISCA             JUMP IF SO
   117B 3C 08 1533             646       MVI   ERR,X'08'         SET UNEXPECTED INTERRRUPT
   117F F2 87 18               647       J     IEXIT             EXIT INTERRUPT
   1182 36 04 1518             648 BISCA L     PSRW,PSR          RESTORE THE PSR
   1186 35 A0 0DF0             649       L     ABSCA1,IAR2       GO TO BSCA-1 MODULE
                               650
   118A C1 88 1184             651 GOON  TIO   UNITC,NORDUC      TEST FOR UNIT CHECK
   118E C1 8C 1199             652       TIO   101,X'8C'         TEST FOR INTERRUPT PENDING
   1192 3C 03 1533             653       MVI   ERR,X'03'         ERROR, INTERRUPT SHOULD BE PND.
   1196 F2 87 04               654       J     IEXIT             EXIT
   1199 C1 88 118C             655 101   TIO   ITBER,X'88'       TEST FOR ITB INTERRUPT
                               656
   119D 3C 00 1513             657 IEXIT MVI   INTFLG,0          SET INTERRUPT OCCURRED INDICATION
   11A1 C2 01 0000             658 X1    LA    *-*,XR1           RESTORE XR1
   11A5 C2 02 0000             659 X2    LA    *-*,XR2           RESTORE XR2
   11A9 35 04 1518             660       L     PSRW,PSR          RESTORE PSR
                               661
   11AD F3 88 01               662       SIO   X'01',CNTRL       RESET THE INTERRUPT
   11B0 C0 87 115C             663       B     INT2              TAKE NEXT INTERRUPT
                               664
                               665 *     ERRORS
   11B4 3C 01 1533             666 UNITC MVI   ERR,X'01'         SET UNIT CHECK
   11B8 C0 87 119D             667       B     IEXIT             EXIT
   11BC 3C 06 1533             668 ITBER MVI   ERR,X'06'         SET ITB ERROR
   11C0 C0 87 119D             669       B     IEXIT
   11C4 38 20 0A0E             670 ERRATC TBN  BSCA1-1,X'20'     IS BSCA-1 INSTALLED?
   11C8 F2 90 08               671       JF    SETATC            IF NOT, GO SET ATT. CHK.
   11CB 3D 05 1533             672       CLI   ERR,X'05'         WAS ATT. CHK. ALREADY SET?
   11CF C0 81 1182             673       BE    BISCA             IF SO, BSCA-1 MAY BE HOLDING US
                               674 *                             IN THE INTERRUPT LOOP.
   11D3 3C 05 1533             675 SETATC MVI  ERR,X'05'         SET ATTACHMENT CHECK
   11D7 C0 87 119D             676       B     IEXIT
```

89F1 DA SYSTEM TEST MODULE

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                 678 ********************
                                 679 *  ERROR LOGOUT    ************************************************
                                 680 ********************
                          11DB   681 LOG     EQU   *
  11DB 8009               11DC   682         DC    XL2'8009'
  11DD C4C140D3D6C7D6E4   11E5   683         DC    CL9'DA LOGOUT'
  11E5 E3                        683
  11E6 8015               11E7   684         DC    XL2'8015'
  11E8 E6D9C9E3C540E3D6   11F6   685 WRTT    DC    CL15'WRITE TOTALS'
  11F0 E3C1D3E2404040            685
  11F7 F0F0F0F0F0F0       11FC   686 WRPC    DC    DL6'0'                WRITE PASS COUNT
  11FD 8016               11FE   687         DC    XL2'8015'
  11FF D9C5C1C440E3D6E3   120D   688 RDTT    DC    CL15'READ TOTALS'
  1207 C1D3E240404040            688
  120E F0F0F0F0F0F0       1213   689 RDPC    DC    DL6'0'                READ PASS COUNT
  1214 8015               1215   690         DC    XL2'8015'
  1216 E2C5D3C5C3E340E3   1224   691 SELT    DC    CL15'SELECT TOTALS'
  121E D6E3C1D3E24040            691
  1225 F0F0F0F0F0F0       122A   692 SLPC    DC    DL6'0'                SELECT PASS COUNT
  122B 8015               122C   693         DC    XL2'8015'
  122D D7D6D3D340E3D6E3   1239   694 POLT    DC    CL13'POLL TOTALS'
  1235 C1D3E24040                694
  123A F0F0F0F0F0F0F0F0   1241   695 PLPC    DC    DL8'0'                POLL PASS COUNT
  1242 8020               1243   696         DC    XL2'8020'
  1244 C4C5E5C9C3C540E7   124C   697 LOGDEV  DC    CL9'DEVICE XX'
  124C E7                        697
  124D 4040404040404040   1262   698 LOGMSG  DC    22CL1' '
  1255 4040404040404040          698
  125D 404040404040              698
  1263 40                 1263   699 MSGBLK  DC    CL1' '
  1264 802B               1265   700         DC    XL2'8028'
  1266 4040E2E3C1E3E4E2   1272   701 LOGST   DC    CL13'  STATUS=XXXX'
  126E 7EE7E7E7E7                701
  1273 4040C3C1D97EE7E7   127C   702 LOGCAR  DC    CL10'  CAR=XXXX'
  127B E7E7                      702
  127D 4040E3C1D97EE7E7   1286   703 LOGTAR  DC    CL10'  TAR=XXXX'
  1285 E7E7                      703
  1287 4040E2C1D97EE7E7   1290   704 LOGSAR  DC    CL10'  SAR=XXXX'
  128F E7E7                      704
                                 705
  1291 8045               1292   706         DC    XL2'8045'
  1293 E7D4C9E361D9C5C3   129B   707         DC    CL9'XMIT/REC='
  129B 7E                        707
  129C 4040404040404040   12D7   708 LOGXR1  DC    60CL1' '
  12A4 4040404040404040          708
  12AC 4040404040404040          708
  12B4 4040404040404040          708
  12BC 4040404040404040          708
  12C4 4040404040404040          708
  12CC 4040404040404040          708
  12D4 40404040                  708
  12D8 804F               12D9   709         DC    XL2'804F'
  12DA 4040404040404040   1328   710 LOGXR2  DC    79CL1' '
  12E2 4040404040404040          710
  12EA 4040404040404040          710
  12F2 4040404040404040          710
  12FA 4040404040404040          710
  1302 4040404040404040          710
  130A 4040404040404040          710
  1312 4040404040404040          710
  131A 4040404040404040          710
  1322 404C4040404040            710
  1329 8045               132A   711 EARLY   DC    XL2'8045'
  132B C5E7D7C5C3E3C5C4   1333   712         DC    CL9'EXPECTED-'
  1333 60                        712
  1334 4040404040404040   136F   713 LOGEX1  DC    60CL1' '
  133C 4040404040404040          713
  1344 4040404040404040          713
```


89F1 DA SYSTEM TEST MODULE

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

  134C 4040404040404040          713
  1354 4040404040404040          713
  135C 4040404040404040          713
  1364 4040404040404040          713
  136C 40404040                  713
  1370 804F               1371   714         DC    XL2'804F'
  1372 4040404040404040   13C0   715 LOGEX2  DC    79CL1' '
  137A 4040404040404040          715
  1382 4040404040404040          715
  138A 4040404040404040          715
  1392 4040404040404040          715
  139A 4040404040404040          715
  13A2 4040404040404040          715
  13AA 4040404040404040          715
  13B2 4040404040404040          715
  13BA 40404040404040            715
  13C1 FFFF               13C2   716 FFFF    DC    XL2'FFFF'
```

```
ERR LOC OBJECT CODE      ADDR STNT SOURCE STATEMENT

                         13C3  718 ********************************
                               719 *  DATA FIELDS AND CONSTANTS  ***************************************
                               720 ********************************
                         13C3  721 DATAST EQU   *                       RIPPLE DATA TABLE
  13C3 C1C2C3C4C5C6C7C8 13E6  722         DC    CL36'ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789'
  13CB C9D1D2D3D4D5D6D7        723
  13D3 D8D9E2E3E4E5E6E7        723
  13DB E8E9F0F1F2F3F4F5        723
  13E3 F6F7F8F9                723
  13E7 405060614A5A7A4B 1401   723 DATAE  DC    CL27' &-/  :.$,*<%%@()_'''+!>=|¬?""
  13EF 5B6B7B4C5C6C7C4D        723
  13F7 5D6D7D4E5E6E7E4F        723
  13FF 5F6F7F                  723
                         1402  724 EXPDAT EQU   *                       EXPECTED READ DATA
  1402 0227F603024000    1408  725 EXP1   DC    XL7'0227F603024000'     DEVICE GETS FILLED IN
  1409 600000            140B  726 EXP2   DC    XL3'600000'             AID, ADDR GET FILLED IN
  140C 110000            140E  727 EXP3   DC    XL3'110000'             SBA, ADDR GETS FILLED IN
  140F C4C5E5C9C3C540E7  1417  728 EXP4   DC    CL9'DEVICE XX'          DEVICE GETS FILLED IN
  1417 E7                      728
  1418 110000            141A  729 EXP5   DC    XL3'110000'             SBA, ADDR GETS FILLED IN
  1418                   1437  730 EXP6   DS    29CL1                   RIPPLE DATA GETS FILLED IN
  1438 03                1438  731         DC    XL1'03'                 ETX
  1439 0000000000000000  1442  732 EXP7   DC    XL10'0'                 FILLER
  1441 0000                    732
                               733
                         1443  734 WRT    EQU   *
  1443 0227F5            1445  735 WRTFLD DC    XL3'0227F5'             STX,ESC,ER/WR (GETS CHANGED TO WR)
  1446 7F                1446  736 WCC    DC    XL1'7F'                 WCC - DO EVERYTHING
  1447 110000            1449  737 WRTADR DC    XL3'110000'             SBA, ADDR GETS FILLED IN
  144A 1DE913            144C  738         DC    XL3'1DE913'             SF, PROT, MI INT., MOD., IC
  144D C4C5E5C9C3C540E7  1455  739 DEVICE DC    CL9'DEVICE XX'          DEVICE GETS FILLED IN
  1455 E7                      739
  1456 1DC1              1457  740         DC    XL2'1DC1'               SF, UNPROT., MOD.
  1458 4040404040404040  1474  741 RIPDAT DC    29CL1' '                RIPPLE DATA GETS FILLED IN
  1460 4040404040404040        741
  1468 4040404040404040        741
  1470 40404040                741
  1475 114040            1477  742         DC    XL3'114040'             SBA TO RESET BUFFER ADDR TO ZERO
  1478 03                1478  743 EWRT   DC    XL1'03'                 ETX
                               744
                         1479  745 MANP1S EQU   *                       WRITE MANUAL INT. PATTERN
  1479 0227F5C2          147C  746         DC    XL4'0227F5C2'           STX,ESC,ER/WRITE,UNLOCK KEYBOARD
  147D 1DE8              147E  747         DC    XL2'1DE8'               SF PROTECTED, MI INTENSITY
  147F D2C5E840C9D540E4  14A5  748         DC    CL39'KEY IN UP TO 20 CHAR., DEPRESS ''ENTER'''
  1487 D740E3D640F2F340        748
  148F C3C8C1D94B6B40C4        748
  1497 C5D7D9C5E2E240D7        748
  149F C5D5E3C5D97D40          748
  14A6 11C150            14A8  749         DC    XL3'11C150'             SBA
  14A9 1D4013            14AB  750         DC    XL3'1D4013'             SF UNPROT, SET CURSOR
  14AC 3CC1E540          14AF  751         DC    XL4'3CC1E540'           REPEAT TO ADDR 20 BLANKS
  14B0 1D60              14B1  752         DC    XL2'1D60'               SF PROTECT REST OF SCREEN
  14B2 03                14B2  753 MANP1E DC    XL1'03'                 ETX
                               754
                         14B3  755 MANP2S EQU   *                       COPY DATA TO SCREEN
  14B3 0227F1C2          14B6  756         DC    XL4'0227F1C2'           STX,ESC,WRITE,UNLOCK KEYBOARD
  14B7 11C261            14B9  757         DC    XL3'11C261'             SBA TO WRITE NEW DATA
  14BA E8D6E440D2C5E8C5  14C3  758         DC    CL10'YOU KEYED:'        MESSAGE.
  14C2 C47A                    758
  14C4 11C3F1            14C6  759         DC    XL3'11C3F1'             SBA
  14C7 4040404040404040  14DA  760 RECMSG DC    20CL1' '                RECEIEVED DATA
  14CF 4040404040404040        760
  14D7 40404040                760
  14DB 11C5C1            14DD  761         DC    XL3'11C5C1'             SBA
  14DE D5D6E640D7D9C5E2  14EE  762         DC    CL17'NOW PRESS ''CLEAR'''
  14E6 E240D7DC3D3C5C1D9       762
  14EE 7D                      762
  14EF 03                14EF  763 MANP2E DC    XL1'03'                 ETX
```



```
ERR LOC OBJECT CODE      ADDR STNT SOURCE STATEMENT

                               764
                         14F0  765 SELPOL EQU   *                       SELECT/POLL MESSAGE
  14F0 37FF32320000      14F5  766 SPFLD  DC    XL6'37FF32320C00'       POLL OR SLECT GETS FILLED IN
  14F6 0000              14F7  767 PSDEV  DC    XL2'0000'               DEVICE GETS FILLED IN
  14F8 2D                14F8  768 ENC    DC    XL1'2D'                 ENQ - ENDS POLL OR SELECT
                               769
                         14F9  770 RDMOD  EQU   *                       READ MODIFIED COMMAND
  14F9 0227F603          14FC  771 RDMODE DC    XL4'0227F603'           STX,ESC,RD MOD,ETX
                               772
  14FD 13DF              14FE  773 ADATA  DC    AL2(DATAST+28)          START OF RIPPLE DATA
  14FF 1401              1500  774 DATEA  DC    AL2(DATAE)              RESTART RIPPLE DATA ADDR
  1501 0000              1502  775 CURRA  DC    XL2'0'                  CURRENT RIPPLE DATA ADDR
  1503 0000              1504  776 CURDEV DC    XL2'0'                  CURRENT DEVICE
  1505 0000              1506  777 LINE   DC    XL2'0'                  CURRENT LINE POINTER (LOW BYTE)
                               778
                               779 *      KEEP THE FOLLOWING 2 BYTE FLAG BYTES TOGETHER AND IN ORDER
                               780 *      BITS 2-7 OF HI BYTE USED FOR DEVICES C2-C7
                               781 *      BITS 2-7 OF LO BYTE USED FOR DEVICES D2-D7
                               782
  1507 00000000          150A  783 ONFLG  DC    XL4'0'                  DEVICE AVAILABLE FLAGS ----------1
  150B 00000000          150E  784 PRTFLG DC    XL4'0'                  DEV = PRINTER FLAGS ----------2
  150F 00000000          1512  785 MANFLG DC    XL4'0'                  MANUAL INTERVENTION FLAGS----------3
                               786
  1513 00                1513  787 INTFLG DC    XL1'0'                  INTERRUPT FLAG
  1514 0000              1515  788 BCNT   DC    XL2'0'                  BUSY COUNTER
  1516 0000              1517  789 DVBCNT DC    XL2'0'                  DEVICE BUSY COUNTER
  1518 115C              1519  790 AINT2  DC    AL2(INT2)               ADDRESS OF INTERRUPT ROUTINE
  151A 0000              1518  791 PSRW   DC    XL2'0'                  PSR STORAGE AREA
  151C 1600              151D  792 LCAR   DC    AL2(XMITRC)             TRANSMIT/RECEIVE FIELD ADDRESS
  151E 0000              151F  793 LTAR   DC    XL2'0'                  LIO TAR FIELD
  1520 0000              1521  794 LSAR   DC    XL2'0'                  LIO SAR FIELD
  1522 0000              1523  795 SCAR   DC    XL2'0'                  SNS CAR FIELD
  1524 0000              1525  796 STAR   DC    XL2'0'                  SNS TAR FIELD
  1526 0000              1527  797 SSAR   DC    XL2'0'                  SNS SAR FIELD
  1528 0000              1529  798 SSTAT  DC    XL2'0'                  SNS STATUS FIELD
  152A 1568              152B  799 AATAB  DC    AL2(ATAB)               START OF ADDR TABLE
  152C 15AE              152D  800 AETAB  DC    AL2(ETAB)               END OF ADDRESS TABLE
  152E 0000              152F  801 ATABPT DC    XL2'0'                  CURRENT ADDRESS TABLE POINTER
  1530 00                1530  802 PFLG   DC    XL1'0'                  PRINT FLAG = FF IF PRINTING
  1531 00                1531  803 WRTCMD DC    XL1'0'                  CURRENT WRITE CR ERASE/WRITE CMD.
  1532 00                1532  804 PASS1  DC    XL1'0'                  = FF IF NOT FIRST PASS
  1533 00                1533  805 ERR    DC    XL1'0'                  INTERIM ERROR HALT BYTE
  1534 000001            1536  806 ONE    DC    XL3'000001'             HEX 1 AND ZERO
                         1535  807 ZERO   EQU   ONE-1                   ZERO FIELD 2 BYTE LONG
  1537 0006              1538  808 SIX    DC    XL2'0006'               HEX 6
  1539 C2C2              153A  809 DEVC2  DC    XL2'C2C2'               DEVICE C2 CONSTANT
  153B D2D2              153C  810 DEVD2  DC    XL2'D2D2'               DEVICE D2 CONSTANT
  153D 0101              153E  811 DEVINC DC    XL2'0101'               CONSTANT TO INCREMENT DEVICES
  153F 4050              1540  812 IR     DC    XL2'4050'               INT. REQ. STATUS
  1541 37FF              1542  813 EOT    DC    XL2'37FF'               EOT RESPONSE
  1543 106B              1544  814 WACK   DC    XL2'106B'               WACK RESPONSE
  1545 107C              1546  815 RVI    DC    XL2'107C'               RVI RESPONSE
  1547 1070              1548  816 ACK0   DC    XL2'1070'               ACK 0 RESPONSE
  1549 1061              154A  817 ACK1   DC    XL2'1061'               ACK 1 RESPONSE
  154B C250              154C  818 IRDE   DC    XL2'C250'               INT. RQ., DEVICE END STATUS
  154D C240              154E  819 DE     DC    XL2'C240'               DEVICE END STATUS
  154F 40C2              1550  820 CC     DC    XL2'40C2'               CONTROL CHECK STATUS
  1551 C840              1552  821 DB     DC    XL2'C840'               DEVICE BUSY STATUS
  1553 016CD9            1555  822 STATR  DC    XL3'016CD9'             START OF STATUS MESSAGE
  1556 016C61            1558  823 TSTREQ DC    XL3'016C61'             START OF TEST REQ MESSAGE
  1559 8045              155A  824 H8045  DC    XL2'8045'               ERROR LOG CONSTANT
  155B 4040              155C  825 POLL   DC    XL2'4040'               POLL CONSTANT AND DEVICE 40
  155D 6060              155E  826 SEL    DC    XL2'6060'               SELECT CONSTANT
  155F E7E7E7E7          1562  827 XXXX   DC    CL4'XXXX'               ERROR BLANKING CONSTANT
  1563 7200              1564  828 X7200  DC    XL2'7200'               1ST WORD OF CONTROL STORE
  1565 0000              1566  829 SVXR2  DC    XL2'0'                  XR2 STORAGE SPACE
                               830
                               831 *      A D D R E S S   T A B L E
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89F1 DA SYSTEM TEST MODULE

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              832
   1567 4040             1568  833 ATAB   DC    XL2'4040'
   1569 40C1             156A  834        DC    XL2'40C1'
   156B 40AB             156C  835        DC    XL2'40AB'
   156D 40E8             156E  836        DC    XL2'40E8'
   156F 40E9             1570  837        DC    XL2'40E9'
   1571 40F3             1572  838        DC    XL2'40F3'
   1573 C150             1574  839        DC    XL2'C150'
   1575 C1D1             1576  840        DC    XL2'C1D1'
   1577 C15B             1578  841        DC    XL2'C15B'
   1579 C1F8             157A  842        DC    XL2'C1F8'
   157B C1F9             157C  843        DC    XL2'C1F9'
   157D C2C3             157E  844        DC    XL2'C2C3'
   157F C260             1580  845        DC    XL2'C260'
   1581 C261             1582  846        DC    XL2'C261'
   1583 C26B             1584  847        DC    XL2'C26B'
   1585 C3C8             1586  848        DC    XL2'C3C8'
   1587 C3C9             1588  849        DC    XL2'C3C9'
   1589 C3D3             158A  850        DC    XL2'C3D3'
   158B C3F0             158C  851        DC    XL2'C3F0'
   158D C3F1             158E  852        DC    XL2'C3F1'
   158F C37B             1590  853        DC    XL2'C37B'
   1591 C4D8             1592  854        DC    XL2'C4D8'
   1593 C4D9             1594  855        DC    XL2'C4D9'
   1595 C4E3             1596  856        DC    XL2'C4E3'
   1597 C540             1598  857        DC    XL2'C540'
   1599 C5C1             159A  858        DC    XL2'C5C1'
   159B C54B             159C  859        DC    XL2'C54B'
   159D C5E8             159E  860        DC    XL2'C5E8'
   159F C5E9             15A0  861        DC    XL2'C5E9'
   15A1 C5F3             15A2  862        DC    XL2'C5F3'
   15A3 C650             15A4  863        DC    XL2'C650'
   15A5 C6D1             15A6  864        DC    XL2'C6D1'
   15A7 C65B             15A8  865        DC    XL2'C65B'
   15A9 C6F8             15AA  866        DC    XL2'C6F8'
   15AB C6F9             15AC  867        DC    XL2'C6F9'
   15AD C7C3             15AE  868 ETAB   DC    XL2'C7C3'
   15AF C1E3E3C1C3C84040 15BF  869 ATTNOR DC    CL17'ATTACH. NOT READY'
   15B7 D5D6E340D9C5C1C4       869
   15BF E8                     869
   15C0 D5D6E340D9C4E861 15D1  870 UNITNR DC    CL18'NOT RDY/UNIT CHECK'
   15C8 E4D5C9E340C3C6C5       870
   15D0 C3D2                   870
   15D2 C9D5E34840D9C5D8 15E5  871 NOTAVL DC    CL20'INT. REQ./NOT AVAIL.'
   15DA 4B61D5D6E340C1E5       871
   15E2 C1C9D34B               871
   15E6 D5D640C9D5E3C6D9 15F1  872 NOINTR DC    CL12'NO INTERRUPT'
   15EE D9E4D7E3               872
   15F2 C9E3C240C9D5E340 15FE  873 ITBMSG DC    CL13'ITB INT ERROR'
   15FA C5D9D9D6D9             873
                               874
   1600                        875        ORG   *+256.0              ORG TO 256 BOUNDARY
                         1600  876 XMITRC EQU   *                   TRANSMIT & RECEIVE FIELD
   1600                  1640  877 XMITE  DS    65CL1
   1641 00               1641  878 FILL   DC    XL1'0'              FILL CHARACTER
                               879
   1642 C1E3E3C1C3C8D4C5 1651  880 ATTMSG DC    CL16'ATTACHMENT CHECK'
   164A D5E340C3C8C3D2         880
   1652 C9D5E340D7D5C440 165F  881 INTPND DC    CL14'INT PND NOT ON'
   165A D5D6E340D6D5           881
   1660 C1E3E3C1C3C84840 1670  882 HBUSY  DC    CL17'ATTACH. HUNG BUSY'
   1668 C8E4D5C740C2E4E2       882
   1670 E8                     882
   1671 C4C1E3C140D4C9E2 167F  883 MISDAT DC    CL15'DATA MISCOMPARE'
   1679 C3D6D4C7C1D9C5         883
   1680 E4D5C5E7D7C5C3E3 1692  884 UNEXP  DC    CL19'UNEXPECTED RESPONSE'
   1688 C5C440D9C5E2D7D6       884
   1690 D5E2C5                 884
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89F1 DA SYSTEM TEST MODULE

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1693 D9E5C940E3D640E2 169F  885 RVIMSG DC    CL13'RVI TO SELECT'
   1698 C5D3C5C3E3             885
   16A0 C5D5E340E3D640C3 16A9  886 EOTMSG DC    CL10'EOT TO CND'
   16A8 D4C4                   886
   16AA C4C5E54B40C8E4D5 16B7  887 DVBMSG DC    CL14'DEV. HUNG BUSY'
   16B2 C740C2E4E2E8           887
   16B8 D5D640C5D9D9D6D9 16BF  888 NOERR  DC    CL8'NC ERROR'
   16C0 E4D5C5E7D7C5C3E3 16D3  889 UNXINT DC    CL20'UNEXPECTED INTERRUPT'
   16C8 C9C440C9D5E3C5D9       889
   16D0 D9E4D7E3               889
   16D4 D4C9C3D9D640C3D6 16E8  890 MICNLN DC    CL21'MICRO CODE NOT LOADED'
   16DC C4C540D5D6E340D3       890
   16E4 D6C1C4C5C4             890
   16E9 F1               16E9  891 DEC1   DC    DL1'1'                DECIMAL ONE
   16EA E0               16EA  892 KATD1  DC    XL1'E0'               REPLACEMENT KATAKANA RIPPLE CHAR.
   16EB 8A9A             16EC  893 KATD2  DC    XL2'8A9A'
                         0A14  894        END   START
```

89F1 DA SYSTEM TEST MODULE

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
AATAB	A	002	1528	0799	0108 0159 0169
ABSCA1	C	001	0DFD	0018	0649
ABSCA2	C	001	0DFF	0019	0103*
ACKIT	A	001	0CB7	0243	0237
ACK0	A	002	1548	0816	0200
ACK1	A	002	154A	0817	0221 0260 0270 0380 0380 0382
ADATA	A	002	14FE	0773	0137 0157
ADDOK	A	004	0BE3	0170	0130 0147 0168
AETAB	A	002	152D	0820	0167
AINT2	A	002	1519	0790	0105 0109
ALONE	A	0C3	0AE3	0106	0065 0104
ARR	C	001	0008	0022	0278 0352 0378 0356 0468
ATAB	A	002	1568	0833	0799
ATABPT	A	002	152F	0801	0108* 0158 0159 0166* 0167 0169*
ATTCHK	C	001	005D	0016	0056 0642
ATTMSG	A	016	1651	0680	0489
ATTNOR	A	017	158F	0669	0511
BCNT	A	002	1515	0788	0050* 0051 0055* 0299* 0328*
BSCA1	A	003	0A0F	0013	0644 0670
BSYERR	A	004	0E0D	0236	0329
BUSY	C	001	008A	0032	0311
BUSYB	A	004	0DAF	0311	0334
BISCA	A	004	1182	0648	0645 0673
CAR	C	001	008C	0028	0304* 0312
CC	A	002	1550	0820	0429
CNTRL	C	001	0088	0036	0106 0302 0662
CONS	A	002	0AC3	0C97	0075
CURDEV	A	002	1504	0776	0100* 0114* 0118* 0119* 0120 0121 0123* 0124* 0131 0133* 0183 0187 0398 0418
CURRA	A	002	1502	0775	0107* 0151 0154* 0155 0157*
DATAE	A	027	1401	0723	0068* 0069* 0774
DATAST	A	001	13C3	0721	0773
DATEA	A	002	1500	0774	0155
DB	A	002	1552	0821	0427
DE	A	002	154E	0819	0423
DEC1	A	001	16E9	0891	0205 022E 0244 0402
DEV	A	004	107A	0529	0526
DEVC2	A	002	153A	0809	
DEVD2	A	002	153C	0810	
DEVICE	A	009	1455	0739	0184 0185 0186 0282
DEVINC	A	002	153E	0811	0114
DEVOK	A	004	086F	0143	0132
DOPOL	A	004	0E9B	0396	0190 0369
DOPOLR	A	004	0F64	0454	0396* 0410
DOSIO	A	004	0D23	0278	0195 0216 0227 0255 0265 0379 0404
DOSIOR	A	004	0DEC	0326	0278* 0280 0324*
DROP	A	004	1138	0623	0626
DROPED	A	004	0E15	0339	0307
DVBCNT	A	002	1517	0789	0053* 0054* 0057* 0189 0189* 0399* 0400
DVBMSG	A	014	16B7	0887	0507
DVBSY	A	004	0F66	0456	0401
EARLY	A	002	132A	0711	0469* 0502* 0610
ENABLE	C	001	00C0	0035	0106
ENINTR	C	001	0002	0034	0302 0309
ENQ	A	001	14F8	0768	0196 0198 0405 0407
EOT	A	002	1542	0813	0238 0357 0384
EOTMSG	A	010	16A9	0686	0527
ERR	A	001	1533	0805	0240* 0248* 0301* 0319* 0320 0336* 0339 0341* 0344 0360* 0364* 0367* 0386* 0418* 0433* 0456* 0470 0471 0475 0479 0483 0487 0491 0495 0499 0505 0509 0513 0517 0521 0525 0675 0625 0627 0629 0646* 0653* 0666* 0668* 0672 0675*
ERRATC	A	004	11C4	0670	0642
ERRHLT	A	002	1137	0622	0470* 0529*
ERROR	A	004	0F84	0468	0241 0253 0321 0337 0340 0342 0346 0361 0368 0387 0419 0457
ERRORR	A	004	1158	0632	0468*
ETAB	A	002	15AE	0668	0800

89F1 DA SYSTEM TEST MODULE

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
EWRT	A	001	1478	0743	0217 0219
EXIT	A	006	0DF0	0328	0311
EXPDAT	A	001	1402	0724	
EXP1	A	007	1408	0725	0187* 0436
EXP2	A	003	1406	0726	0163* 0207* 0211* 0235*
EXP3	A	003	140E	0727	0164*
EXP4	A	009	1417	0728	0185*
EXP5	A	003	141A	0729	0169*
EXP6	A	001	1437	0730	0152*
EXP7	A	010	1442	0732	0236 0564 0569
FFFF	A	002	13C2	0716	0469
FILL	A	001	1641	0878	0297 0297*
GETSET	A	004	1064	0532	0474 0478 0482 0486 0490 0494 0498 0504 0508 0512 0516 0520 0524 0528
GO	A	004	0886	0151	0113 0139 0141
GOACK	A	004	0E75	0378	0245 0420 0452
GOACKR	A	004	0E67	0390	0378* 0385
GOON	A	004	118A	0651	0643
GOSUPR	A	004	0E01	0332	0345
GOTIT	A	004	0E25	0344	0331
HALT	C	001	0222	0325	0621
HBUSY	A	017	1670	0882	0477
HEAD	A	002	10E2	0580	0575*
H8085	A	002	155A	0824	0502
IAR2	C	001	00A0	0024	0109* 0649*
IEXIT	A	004	119D	0657	0647 0654 0667 0669 0676
INTFLG	A	001	1513	0787	0300* 0317 0330 0657*
INTPND	A	014	165F	0881	0481
INT2	A	004	115C	0638	0663 0790
IO1	A	004	1199	0655	0652
IR	A	002	1540	0812	0413
IRDE	A	002	154C	0818	0431
ITBER	A	004	118C	0668	0655
ITBMSG	A	013	16FE	0873	0493
KATD1	A	001	16EA	0892	0068
KATD2	A	002	16EC	0893	0069
LCAR	A	002	151D	0792	0288 0304
LINE	A	002	1506	0777	0099* 0116 0125 0129* 0134* 0143* 0144 0144* 0146 0146* 0170
LINES	A	003	0A0C	0012	0066 0097
LOG	A	001	11C8	0681	0011
LOGCAR	A	010	127C	0702	0285* 0535
LOGDEV	A	009	124C	0697	0186* 0282*
LOGEX1	A	001	136F	0713	0565 0615
LOGEX2	A	001	13C0	0715	0570 0619
LOGMSG	A	001	1262	0698	0281* 0283* 0473* 0477* 0481* 0485* 0489* 0493* 0497* 0501* 0507* 0511* 0515* 0519* 0523* 0527* 0530*
LOGSAR	A	010	1290	0704	0287* 0545 0600
LOGST	A	013	1272	0701	0284* 0560
LOGTAR	A	010	1286	0703	0286* 0540
LOGXR1	A	001	12D7	0708	0555 0604
LOGXR2	A	001	1328	0710	0560 0608
LSAR	A	002	1521	0794	0291* 0306
LTAR	A	002	151F	0793	0288* 0289* 0290* 0305 0316
MANFLG	A	004	1512	0785	
MANIN	A	004	0CF0	0255	0462
MANIN1	A	005	0D07	0264	0447
MANPIE	A	001	1482	0753	0256 0258
MANP1S	A	001	1479	0745	0256
MANP2E	A	001	14EF	0763	0266 0268
MANP2S	A	001	14B3	0755	0266
MICLP	A	004	0A30	0055	0058
MICNL	A	004	0CE5	0248	0052 0056
MICNLM	A	021	16E8	0890	0519
MICRON	A	004	0A48	0064	0063 0070
MISDAT	A	015	167F	0883	0501
MSGBLK	A	001	1263	0699	0281 0579

89F1 DA SYSTEM TEST MODULE

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
AVDATA	A	005	0D88	0298	0294* 0295* 0296*
NEXT	A	004	0A7E	0078	0092
NOERR	A	008	168F	0688	0283
NOINTR	A	012	15F1	0872	0497
NOKAT	A	004	0A62	0C70	0067
NOPAS1	A	006	0C8D	0236	0233
NORDUC	C	001	0088	0637	0651
NORDY	A	003	0A42	0060	
NOTAVL	A	020	15E5	0871	0530
NOTRDY	C	001	0058	0315	0307
NOTST	A	005	0BBA	0162	0160
ONE	A	003	1536	0806	0057 0093 0154 0290 0328 0399 0807
ONFLG	A	004	150A	0783	0073 0073* 0074* 0082* 0101 0135 0138
OOPS	A	004	0EEE	0419	0434
OOPS1	A	004	0565	0368	0365
OPT3	C	001	0008	0038	
OPT4	C	001	0010	0039	
OPT5	C	001	0020	0040	
PASS1	A	001	1532	0804	0064 0111 0112*
PFLC	A	001	1530	0802	0140* 0212 0440* 0443*
PLPC	A	008	1241	0695	0402* 0596
POLL	A	002	155C	0825	0100 0133 0397
POLT	A	013	1239	0694	
PREF	C	001	0A30	0041	0103 0322 0332 0572 0623
PRINT	C	001	021A	0026	0576 0581 0585 0589 0593 0597 0601 0605 0612 0616
PRTFLG	A	004	150E	0784	0138
PSDEV	A	002	14F7	0767	0398*
PSR	C	001	0004	0023	0640 0641* 0648* 0660*
PSRW	A	002	151B	0791	0640* 0648 0660
RDMOD	A	001	14F9	0770	0228
RDMODE	A	004	14FC	0771	0228 0230
RDPC	A	006	1213	0689	0244* 0588
RDTT	A	015	120D	0688	
READ	A	001	0CA0	0225	0222
RECMSG	A	001	14DA	0760	0264*
REOT	A	004	0E5A	0364	0239 0358
REST2	A	004	0DE8	0325	0279*
RIPDAT	A	001	1474	0741	0153*
RPTPOL	A	006	0EAB	0399	0428
RRVI	A	004	0E61	0367	0356
RTNG1	A	001	0A10	0044	0010
RVI	A	002	1546	0815	0355
RVIMSG	A	013	169F	0885	0523
SACK	A	004	0F60	0452	0426 0448 0450
SAR	C	001	0089	0030	0306* 0314
SCAR	A	002	1523	0795	0312* 0534
SEL	A	002	155E	0826	0194
SELECT	A	006	0C40	0194	
SELPOL	A	001	14F0	0765	0196 0405
SELT	A	015	1224	0691	
SET	A	004	0AC1	0096	0071 0071* 0072* 0082 0083 0083* 0084 0084* 0085 0085* 0086
SETADR	A	004	0BA9	0158	0156
SETATC	A	004	11D3	0675	0671
SETPOL	A	006	0C2F	0189	
SETTBN	A	003	0A82	0079	0094
SF1	A	003	0EE5	0417	0172* 0430 0432
SF2	A	003	0F5D	0451	0178*
SHIFT	A	004	0AA6	0089	0090
SHIFTR	A	006	0B73	0144	0145
SIO1	C	001	0058	0017	0048 0049 0050 0055 0060 0061 0249
SIX	A	002	1538	0808	0166 0324
SLPC	A	006	122A	0692	0205* 0592
SN1	A	003	0F02	0425	0173*
SN2	A	003	0F7D	0461	0176*
SPFLD	A	006	14F5	0766	0194* 0397*
SP1	A	003	0C86	0234	0175*

89F1 DA SYSTEM TEST MODULE

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SSAR	A	002	1527	0797	0314* 0544
SSTAT	A	002	1529	0798	0315* 0549
STAR	A	002	1525	0796	0313* 0539
START	A	003	0A14	0048	0628 0630 0894
STATR	A	003	1555	0822	0411
STATUS	C	001	0088	0031	0315
STOPIT	A	004	1132	0621	0573 0611
SUPER	C	001	0A0A	0042	0323 0333 0624
SVXR2	A	002	1566	0829	0102* 0115 0128* 0136*
TAID	A	005	0F28	0436	0412
TALONE	A	004	0AC4	0099	0087
TAR	C	001	008A	0029	0305* 0313
TCLR	A	003	0F57	0449	0445
TENT	A	003	0F47	0444	0442
TERR0A	A	004	102A	0509	0506
TERR0B	A	004	103A	0513	0510
TERR0F	A	004	104A	0517	0514
TERR2	A	004	0FA4	0475	0472
TERR20	A	004	105A	0521	0518
TERR3	A	004	0FB4	0479	0476
TERR4	A	004	0FC4	0483	0480
TERR40	A	004	106A	0525	0522
TERR5	A	004	0FD4	0487	0484
TERR6	A	004	0FE4	0491	0488
TERR7	A	004	0FF4	0495	0492
TERR8	A	004	1004	0499	0496
TERR9	A	004	101A	0505	0500
TLIN	A	004	0A85	0080	0075* 0076* 0078 0078* 0079* 0088* 0089 0089* 0091 0093*
TM1	A	003	0C39	0192	0177*
TN2	A	003	0F4B	0446	0179*
TPF2	A	003	0F3D	0441	0439
TP1	A	003	0C70	0209	0174*
TRVI	A	004	0E31	0352	0202 0223 0262 0272
TRVIR	A	004	0E71	0372	0352*
TSTATT	A	004	116C	0642	
TSTBY	A	005	0F08	0427	0424
TSTDE	A	005	0EFA	0423	0414
TSTERF	A	004	0DD2	0320	0318
TSTRDY	A	004	0DA8	0307	
TSTREQ	A	003	1558	0823	0459
TTSTR	A	005	0F74	0459	0437
T1	A	003	0EDE	0415	0171*
T2	A	004	0B1A	0120	0117
T3	A	004	0B2D	0125	0122
T4	A	004	0B42	0131	0126
UNEXP	A	019	1692	0884	0485
UNITC	A	004	1184	0666	0651
UNITNR	A	018	15D1	0870	0473
UNPACK	C	001	021E	0027	0181 0532 0537 0542 0547 0552 0557 0562 0567
UNXINT	A	020	16D3	0889	0515
UPDATE	A	006	0B01	0114	0193 0246 0261 0271 0354 0362 0370 0388 0416 0421 0458
UPL	A	004	0A91	0083	0081
WACK	A	002	1544	0814	0353
WCC	A	001	1446	0736	0208* 0214*
WHAT	A	004	0F23	0433	0460
WRPC	A	006	11FC	0686	0226* 0584
WRT	A	001	1443	0734	0217
WRTADR	A	003	1449	0737	0162*
WRTCMD	A	001	1531	0803	0137* 0161* 0206
WRTFLD	A	003	1445	0735	0206* 0215*
WRTPAT	A	004	0C89	0216	0210 0213
WRTPRP	A	001	0C5C	0204	0201
WRTT	A	015	11F6	0685	
WXYX	A	001	0A00	0004	
XMITE	A	001	1640	0877	0197 0218 0229 0236 0257 0267 0381 0406 0554 0559
XMITR	C	001	008A	0033	0309

89F1 DA SYSTEM TEST MODULE

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
XMITRC	A	001	1600	0876	0292 0792
XR1	C	001	0001	0020	0063 0070* 0071 0071 0072 0075 0075 0076 0078 0878 0079 0082
					0083 0083 0084 0084 0085 0085 0086 0088 0089 0085 0091 0093
					0151* 0152 0153 0158* 0162 0163 0164 0165 0170* 0171 0172 0173
					0174 0175 0176 0177 0178 0179 0200 0221 0232 0238 0260 0264
					0270 0280* 0289 0291 0294 C295 0296 0316* 0353 0355 0357 0384
					0409 0411 0413 0423 0427 0429 0431 0436 0438 0441 0444 0449
					0459 0638 0668*
XR2	C	001	0002	0021	0101* 0102 0115* 0127 0127* 0128 0135* 0136 0192 0205 0234 0279
					0292* 0298 0325* 0415 0417 0425 0446 0451 0461 0639 0669*
XXXX	A	004	1562	0827	0284 0285 0286 0287
X1	A	004	11A1	0658	0638*
X2	A	004	11A5	0659	0639*
X7200	A	002	1564	0828	0051
ZERO	A	003	1535	0807	0641

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

89F1 DA SYSTEM TEST MODULE

OBJECT CARD LISTING

THE CHARACTER • INDICATES A BLANK COLUMN AND THE CHARACTERS D̄ Ē M̄ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96


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 GBK GBD    PN 42  34260 EC 825032   89F DA SYSTEM TE  ST               84000400    89000  0        89F10000
T<&Y15-D      B/   J68V  H &  D ===  3CHC3C< 0OAMNC&D  NEJMUO DC9L0BEJ*  8=JMO<E-   B8.I2<  /G&UG0# 89F10001
T.0Z/EJPAP&3VC-D  ME1M608 MK|(0-|(  08C4 EL.2 R&8 &Y  <0Z <C  M J9DC D  L#ASX 80_MK+-F&8  .B&MASK389F10002
T(&DP0-DMKE8C:PV  8GGU| 1MME&Y38AM  GP E :70M|M0 |TS  8+C48    8Z EG-<  M8XV; 7V9P-(9 84  MC 8C:BM89F10003
T<0..IN8C:PV80G8  20BE8 TS; L8=0B   MZXS |X8&8X9+ M   N(X8G2TM    8-X  8-AMFC DNA  3.2X  VMJ0MM2ME9F10004
T.C.#EM3B /MG( M  MRT6I8-C2-&0< &7  =EJX3S< < JMEE|8  < JM?EXX2YAMR|&   M<T3"   _MKMTG14  0E&MA=&-89F10005
T.-XDEL.2-0M+ JM  CEL05 /MW+M MATH  &ECD E&&:-AMC+ Y  MACUEE&L2U -#-AM  D+8     XIKD)FJM  +B--A3R<89F10006
T< _8E&<8 JMF8Z   +8-MA( MMRT2 E&S  2/:D*P/MD8-DWC D  MAAM*|M MAXMDE&*  4 /MW|  TM2*TMJY  LCO#ADS&89F10007
T.0>.8JM1C&<MC/M  M8-C:||8M<|MGE30  BE&M+ JMFE&s M _  3C  AA/MEDY))(&C  M /G* 84WI8 *F/0  |8 08)E&89F10008
T.->:EC* GA0M)    + JMBEL0( JMBE&C  2A 0< JMBE|8E JM  ?C&DA.1M.8-CD||#  M<J0 .K0UMACED1D  (B00A:A889F10C09
T.&?Y JJI A0AE X  BG CMC-M* J&EA 8  AEK8M+ 4AEK8N.-M  DA-CAEK8MM8MAE&0  *      8XXIJ8*FAC  JC *EE3*89F10010
T.000C_8 G  +9-   *  &C A0 CGD G    <_0 *  *= A0 CCY   G  |P- *  *+ <8  G /8A   MKG-F/M  &E0CAE8C89F10011
T. 1EE&&MM&0AEA*  MM&GADU0MM&0 E -  MA 8AEJ*ME88GCZ>  8  T D XAC DM*JA  ; 80D1/88FJML C04  IA0<A:Y889F10012
T.0150M*(M0 MEU   M=D4A JMM8YD00M*  +<&R&CSYD:&0 EDM  M<L1-E U#8AJF>    D8Z L 8UVMJ&8FJM  +B&*CJ3-89F10013
T.&2T|+-MBL4 ELC  2-&-:8AJF||#MJ*B  GCK< (JR EG/( &C  MK&8ACMC /081AV   J"     84ZIKD*F/Q  KC-*C&&M8&F10014
T< 3ME>X /04T  <  0&AL8-;-C8-DG>-   D|+-M8&5 EU M&?M  ADM4A JM80MD+0T0  MEL| /0 >MS0;&A-  .8&MASR889F10015
T.-4CC8&FMAMLE>X   /0&50M*. L0|EL|  30MC /0=D0M*(M0   9EL XXU4A JMM0MC  . *  .KUUM/8ED08  .A0M38&M89F10016
T.-42/0816A<M&/3   /04T C0D&AL?L&D  AEM. -&XA0M*+<L&  MC;84 -7.(&C(#00  L0WM .SYMM/8EE/D  |80880MY8&F10017
THOS;DW<< JI<EEM  <A1ISE.8< 112E0M  < 118EGM< 1MFE0M  < 1+&E0M< JM-EJ4  M2UVM18)FJ*LD&4  +A0MA8A8&&F10C18
T.06+G-DMG0D+ JM  -ELC* JM/ 8MBE-   * &G<AJ0 C0UAG     (S-D<&AR EUF<       C3    YISD*E1<  +B--CL#M89F10019
T.06=EJ&8"1ML|    M<"+M TF<EJ41S/M  -<QUMM*E0C/P3S-.  AS-7C<M0MM3BMEK#  0&JMX 88.12<*FA&  &E&#A4M+89F10020
```

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T<-71<H%NHLMAEJB	' AHL8YDO| '%N<34	'BL| '&=D|GUH'<	AB-Y+ &7TELTB -	'OH= '8A B-WF/Q	KB0=CQBMB9F10021
T< 8SEJHN(%B-C-4	' AHL8YDU|GUH'<	AB-. /06?| HN<88	GC&&' AM30 C|/C0	HEL| /0 >H=S0SG/Y	.A0<A79889F10022
T< 9LC86' AH3=HD	+ '86C8648 94L&D	AE%L -&%AL&DAEM8	2-J_(&DN&?%ACC0	DEL| /0 >I18EE/D	(B&%A5YY89F10C23
T.0:CC8L /0%A|A'	NC=HGAC0-EL| /0=	D0H=+W88GBGG /0'	' (-+W38G&CK<' JR	EMZ(B8%HB&=FA&	&B&%A"3 89F10024
T.-:2 &DN&?%ACC0	DEL| /0=D0H=. =B	G' 4E '%C DH='1MDC-DME1H	6+B' B0DI56-G/Y	KC-YC1ED89F10025	
T<&=UEJ82D. F=A1	AE>X /04T' -0&AL	8-L= 8YFQL&HBENP	2 NN(&=N&|HAG.-	'<B&B0D <K=-EAH	+E=-A6I889F10026
T<&80>C' C' N<1H	D0H=|/<BGCXP /0%	AL&DGEM82 &E: C	2/5/(&=NH%BACD_	(&=NHC' <B%XFJ6	&C -FPAN89F10027
T<-'I-&=VL&DGEM3	'-&&V| &N<8BGC>9	(-HME|HA&P5% "H	AAC3"ELA'=-|2 &&	8 AH0-P4C BEVFA<	|B0=BNLD89F10028
T<0''8-D%D' HOA	(A"HGBP5_ "HA 8%	'E<BGCXP /0' | U	N<&B6C8L /0%AL&+	BENT' &8T>- 2.5U	VHJUI=E885F10029
T.-=%' T /030(' -	JO80AD2YL0-0 DL=	N<34AEL|2 &U<DJI	SE)G2/= ' /H38-C	ICA' ZH5 REJ<	|C&UE1Y=89F10030
T.0=+DWHO=|HG4C4	CEL|2 &U<CJISEV"	2/8 'AAH38-DICAH	K0/EK8Y;0|&HNC"+	AE&0| HS</F/<	JB-<AJ#D89F10031
T.1 <DWHO=-HGYC4	FEL|2 &U<CAISE-8	2/9 'A1H38-DIC %	KQ/F18Y; |&-NC"+	AC00+ HS</F/<	JB-<A#8D89F10032
T./ 8DWH0-00AD2Y	N07+GET4IEL|2 &U	<CJISE.-=2/5Y'8/H	38-DICA KQ/O"8Y)	H|6% ZI2 RE1'	IAG<A=8Y8GF10033
T.1A.EL|2 &U<D1I	SE_|2/3Y'C1H38-D	ICA&KQ/8Y8Y=D|K	N<"HAB&0<DWHOX"+	GFT4& HS-/F/-	JE--A-T489F10034
T./8EEL|2 &U<BJI	SEDX2/0Y8-AD7CA<	KQ/PVOH=8G-HNHJI	80H=BG-HNIJHF0H=	EG-H ZI2 :E1N	JE--A53N89F10035
T./CIEK=KU<BG /8	BEKUK=%BG /8:E/4	K5BBG /8TEU LH<B	G /8:EA8L&8E& /8	TEDH B8XIJ8=EJ<	<B-<A=1Q8GF10036
T<1C'D8 '5&Y 8-E	-<' &8/H30H=8F%H	-C8=I <BG /CAEJG	80+=8FYDND/| /0+	E-J=KH%BG - 0HB	OC-CA0HL89F10037
T<1D1FYHHDUG /0H	E-S%KU<BG /DAJJ.	PQH=8FYR|D2-'"1<	D8YD&?H=8FYEED&"	/0N=/U8L0 3+2	=E JD7.889F10038
T</EU0H=BHYU |QU	N < AB-Y'C1M30MD	J=C4EEL| -6Y#|&D	N<E8AB/L /0' (D	J2C&EDE-4 CC_IKD	)FJHJJ2-89F10039
T<AFNAAH8(&&N(=E	)D=LASJFH=B MC?H	&A3Q.EL|2/1%EAAH	8(E ("=FHD8LATAF	R| <N<D 0.B--FJH	+8-0B&SD89F10040
T<JG8B%=DOO%J?C0	EJ|B 6' 0-H' CH	DEJ?3S G /1E=| D	N<E8GDR48A/H30H=	JXL--B-8 <K4ZIKD	)E-YF60H8GF10041
T(/G=8Z H|&HN<8B	ADOHBAJM30H=JXQ'	I1<E 4'8G5>LT-AP	W6=XT1NCT5>|A4=I	&DCC8|C08|8 E&'	KC-YF'8U89F10042

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/H96=PA1DCTS>|	A4=1 &DA 8|C08|C	0-APS1)|E0=(8'8	T0)|S&DC08|C08|8	E)-04'(8'8T0)|	S&D 7R489F10043
T+/I48|C08|C08|8	H<LE9=XC1HCX94A	&DA &DA &DA &DA	&DA &DA &DA -8_	&+.7G:|U8X=X9=-	X&D 7T=89F10044
T+/HTD8GR->-X9=)	&+|A6P=X9=-X&DC	S0)V=&=-X68AE9'L	I2=6F1+(=&DA &DA	&DA &DA &DA &DA	&D -0889F10045
T+/.D&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &MA|&DA	&DA &DA &DA &DA	&D E8V89F10046
T+/<V&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&CA &CA &DA &DA	&DA &DA &DA &DA	&D PQ089F10047
T+/(-&DA -DPE9'-	E0=|E1FA &DA &DA	&DA &CA &DA &DA	&CA &CA &DA &DA	&DA &DA &DA &DA	&D PAC89F10048
T+/+8&DA &DA &DA	&DA &DA -D' &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &CA	&D E0089F10049
T+/|D&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &|==0+.C1<F	F18TI4).L5(PD5'T	R8>< QI089F10050
T+/&J9+PW9=TZ8|G	28"L8'9-8=HA&QFE	HCXZ.06_8LE1%-D5	)&PE+PW9=L8'9-0F	X'-<86 A- J C	D1:N :0&89F10051
TBA&E2+|E&+-XD&	.....	.....	.....	.....	Q:889F10052
T+/J2 0	' BI"N"D& G;U	L1<PV2+|E&+-XG+E	&DA &DA &DA &DA	&DA &DA &DA &DA	&D 9EU89F10053
T+/K_&D J&D C S-	S0/7Y4%PY6<XN6+L	P&+|0&|.06<|H0)V	.E4CD1)-R1:.S&G7	E5:|E6P5 D+E&GH	L|<D E 889F10054
T+/LY9H)0 <BI"G	8D+1/:(8U&(.E:<P	D:/GCBHA &DA &DA	&DA &DA &DA &DA	D+PA5)8W&(-R1:.	S&G4 3HD89F10055
T(/H-0'|E0)V' 3-	"<TH .&HX'-<	L71&A	.....	JP E-	4<A0N).D89F10056
T+AN3	ANYEE8	D AX.64_HA HA	&(="8&E1A8DG &Q+I	&QUA 0%/ 03R 01	/ 4.)DQ89F10057
T+/DL-DN &FA-9=-	X97H A &DCA&D_	:DCZ&||AH<GJ0N?	A=<G90%|B0<I/0W?	C2<|I0'|C8<|107?	D6<& R:889F10058
T+/P+6=LT1HCE0'N	.1:TE:+P31VCF4+R	S1?TF=+-C0:|T0+|	HK4CN=>(6+PA1+T	N=>(64LY0:LN2:(	08- :1Y89F10059
T.1P=1+|K2)PTK4C	R1)/.0)PD84CA9+G	I4+?NSUCI5:|E6)X	U=|I&8I 2)PY6<P	R6)8R	-C89F10060
T+/R8 <GT8BGC2(L	E5:(0&TE0'.I5:(	&'PD&(PD84COS+G	T9B6C2D_ 2+LN14C	B9+.Y1<GT0+HCH2:.	C5_6 1AN89F10061
T+/E6S8GR1%LN1:-	P1+|T1+J 6+PS5'8	N&PR6+V 8'R 8%P	L1+|T1)ST6+|06<|	H1<LE9N_ 2+LN14C	E9+H 2-089F10062
T(J8%:(P06<PR6)8	R6(PE9'-E0=|E1DC	I&:|E6)XU8=|02+|	RSUCC&%LE6(P08+C	LS%GD1+L18HDE	0D+89F10063
EB/J+E7*=-DC"PH8	="7N&F| | C F% A&C R A	S& 0	0854066B721	0237E&E<89F10064	

LAST PAGE

FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                                2         SEQ   0
   0A00                         3 SEX     START X'A00'
                                4         TREP
                                5         DECK  4
                                6
                                7 ****** SECTION PREFACE ********** ADDR ******************************
                                8
   0A00 FC80            0A01    9         DC    XL2'FC80'           A00  ID
   0A02 00              0A02   10         DC    XL1'0'              A02  FLAGS
   0A03 00              0A03   11         DC    XL1'0'              A03  RTN #
   0A04 0000            0A05   12         DC    XL2'0'              A04  N/A
   0A06 0A20            0A07   13         DC    AL2(RTN1)           A06  RTN 1
   0A08 FFFF            0A09   14         DC    IL2'-1'             A08
   0A0A A00000          0A0C   15 A0       DC    XL3'A00000'          * 5444 SPINDLE 1 CE MODULE      *GC*
   0A0D C10000          0A0F   16 C11      DC    XL3'C10000'          * 3340 DRIVE 1  CE MODULE       *GC*
   0A10 141000          0A12   17 ID14     DC    XL3'141000'         A10  32XX
                               18
   0A13 4040404040404040 0A1C  19 INPUT    DC    CL010' '
   0A1B 4040                   19
   0A1D 40              0A1D   20         DC    CL1' '
                        000A   21 LNG      EQU   010
   0A1E 0A1C            0A1F   22 END      DC    AL2(INPUT)
                        0A20   23 RTN1     EQU   *
                               24
                               25 ************************************************************************
                               26 **      ROUTINE 1 PREFACE                                          **
                               27 ************************************************************************
                               28
                               28
   0A20 01              0A20   29         DC    IL1'1'                RTN #
   0A21 00              0A21   30         DC    XL1'0'                FLAGS
   0A22 FFFF            0A23   31         DC    AL2(*-*-1)            NEXT RTN
                               32
   0A24 3D 00 184F             33         CLI   LOADFL,0              TEST FOR MICRO-CODE ALLREADY LOADED
   0A28 F2 01 1F               34         JNE   AGAIN                 SKIP LOADING IF SO
   0A2B 0C 12 165E 0A12        35         MVC   DBUF+19(19),ID14      SAVE THE SECTION PREFACE
   0A31 3A 08 020D             36         SBN   SBYTE5,SSW2C          SET SSW 2C ON
   0A35 C0 87 022A             37         B     LOAD                  GO LOAD AND RUN SECTION 893 TO
   0A39 08              0A39   38         DC    XL1'08'                GET MICRO-CODE LOADED
   0A3A 0893            0A3B   39         DC    XL2'0893'
   0A3C 0C 12 0A12 165E        40 RTNLDR  MVC   ID14(19),DBUF+19      GO RESTORE THE SECTION PREFACE
   0A42 3C FF 184F             41         MVI   LOADFL,X'FF'          SET MICRO-CODE LOADED FLAG
   0A46 3B 08 020D             42         SBF   SBYTE5,SSW2C          RESET SSW 2C
                               43
                               44 ********** PRINT OPTIONS  SECTION          **********************
   0A4A 3C 00 0A95             45 AGAIN    MVI   DSKTYP,0                                        *GC*
   0A4E 38 2C 0A08             46         TBN   A0-1,X'20'     CHK FOR CE MODULE ON 5444 DRIVE 1  *GC*
   0A52 F2 90 41               47         JF    INS1                                             *GC*
   0A55 38 20 0ADE             48         TBN   C11-1,X'20'    CHK FOR CE MODULE ON 3340 DRIVE 1  *GC*
   0A59 C0 90 0BA5             49         BF    INS6           JUMP A0 ENTRY BUT NO C1 ENTRY UDT  *GC*
   0A5D C0 87 021A             50 INS     B     PRINT          PRINT THAT BOTH 5444 & 3340 ARE IN UDT*GC*
   0A61 42              0A61   51         DC    XL1'42'        FLAG  BYTE                         *GC*
   0A62 3E              0A62   52         DC    AL1(INMSG-INMSGS) LENGTH OF MESSAGE               *GC*
   0A63 0AF9            0A64   53         DC    AL2(INMSG)     SOURCE ADDRESS                     *GC*
   0A65 14FF            0A66   54         DC    XL2'14FF'      MANUAL ENTER NEEDED                *GC*
   0A67 C0 87 021A             55         B     PRINT          PRINT MORE COMMENTS                *GC*
   0A6B 02              0A6B   56         DC    XL1'02'        FLAG  BYTE                         *GC*
   0A6C 33              0A6C   57         DC    AL1(INMSG1-INMSG) LENGTH OF MESSAGE               *GC*
   0A6D 0B2C            0A6E   58         DC    AL2(INMSG1)    SOURCE ADDRESS                     *GC*
   0A6F C0 87 021A             59         B     PRINT          PRINT MORE COMMENTS                *GC*
   0A73 07              0A73   60         DC    XL1'07'        FLAG  BYTE                         *GC*
   0A74 45              0A74   61         DC    AL1(INMSG2-INMSG1) LENGTH OF MESSAGE              *GC*
   0A75 0B71            0A76   62         DC    AL2(INMSG2)    SOURCE ADDRESS                     *GC*
   0A77 C0 87 0222             63         B     HALT                                             *GC*
   0A7B 89FF            0A7C   64         DC    XL2'89FF'      MANUAL ENTER NEEDED                *GC*
   0A7D 38 02 020D             65         TBN   SBYTE5,SSW2E   CHK SSW 2E 'ON'                    *GC*
   0A81 F2 10 1E               66         JT    INS4           JUMP IF SSW 2E IS ON               *GC*
```


FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   0A84 38 04 0200             67         TBN   SBYTE5,SSW2D  CHK SSW 2D 'ON'                    *GC*
   0A88 C0 10 0BAC             68         BT    INS5           JUMP IF SSW 2D IS ON               *GC*
   0A8C 0C 03 0B9C 0BA0        69         MVC   INMSG3(4),OFF  PRINT THAT BOTH SSW 2D & 2E ARE OFF *GC*
   0A92 F2 87 18               70         J     INS8           PRINT                              *GC*
   0A95 00              0A95   71 DSKTYP   DC    XL1'00'        FIELD FOR DISK TYPE DEFINITION.    *GC*
   0A96 38 20 0A0E             72 INS1    TBN   C11-1,X'20'    UDT ENTRY FOR C1??                 *GC*
   0A9A C0 10 0BAC             73         BT    INS5           BRANCH C1 ENTRY BUT NO A0 ENTRY IN UDT*GC*
   0A9E C0 87 0BF9             74         B     DSKM33+1       BRANCH NO DISK AVAILABLE IN UDT TABLE *GC*
   0AA2 38 04 020D             75 INS4    TBN   SBYTE5,SSW2D  CHK SSW 2D 'ON'                    *GC*
   0AA6 C0 90 0BA5             76         BF    INS6           JUMP IF SSW 2D IS ON               *GC*
   0AAA 0C 03 0B9C 0BA4        77         MVC   INMSG3(4),ON   PRINT THAT BOTH SSW 2D & 2E ARE ON  *GC*
   0AB0 C0 87 021A             78 INS8    B     PRINT          PRINT THAT BOTH SSW 2D & 2E ARE XXX *GC*
   0AB4 02              0AB4   79         DC    XL1'02'        FLAG  BYTE                         *GC*
   0AB5 2B              0AB5   80         DC    AL1(INMSG3-INMSG2) LENGTH OF MESSAGE              *GC*
   0AB6 0B9C            0AB7   81         DC    AL2(INMSG3)    SOURCE ADDRESS                     *GC*
   0AB8 C0 87 0A5D             82         B     INS            PRINT CONTROL STATEMENTS AGAIN.    *GC*
                        0ABB   83 INMSGS   EQU   *-1   START ADDRESS OF PRINT COMMENT AREA        *GC*
   0ABC 40E2E8E2E3C5D440 0AEA  84         DC    CL47' SYSTEM HAS BOTH THE 5444 AND 3340 DISK DEFINED'
   0AC4 C8C1E240C2D6E3C8       84
   0ACC 40E3C8C540F5F4F4       84
   0AD4 F440C1D5C440F3F3       84
   0ADC F4F040C4C9E2D240       84
   0AE4 C4C5C6C9D5C5C4         84
   0AEB 40C9D540E2D7E4E3 0AF9  85 INMSG    DC    CL15' IN SPUT TABLE.'
   0AF3 40E3C1C2D3C54B         85
   0AFA 40D7D3C5C1E2C540 0B27  86         DC    CL46' PLEASE IDENTIFY INPUT DEVICE FOR SYSTEM DISK '
   0B02 C9C4C5D5E3C9C6E8       86
   0B0A 40C9D5D7E4E340C4       86
   0B12 C5E5C9C3C540C6D6       86
   0B1A D940E2E8E2E3C5D4       86
   0B22 40C4C9E2D240           86
   0B28 D7C1C3D24B      0B2C   87 INMSG1   DC    CL05'PACK.'
   0B2D 40E3E4D9D540D6D5 0B5B  88         DC    CL47' TURN ON ONLY ONE SENSE SWITCH ** SSW 2E FOR 54'
   0B35 40D6D5D3E840D6D5       88
   0B3D C540E2C5D5E2C540       88
   0B45 E2E6C9E3C3C8405C       88
   0B4D 5C40E2E2E640F2C5       88
   0B55 40C6D6D940F5F4         88
   0B5C F4F4405C5C40E2E2 0B71  89 INMSG2   DC    CL22'44 ** SSW 2D FOR 3340.'
   0B64 E640F2C440C6D6D9       89
   0B6C 40F3F3F4F04B           89
   0B72 40C6D6E4D5C44CE3 0B9C  90 INMSG3   DC    CL43' FOUND THAT SSW 2D AND SSW 2E ARE BOTH OFF.'
   0B7A C8C1E340E2E2E640       90
   0B82 F2C440C1D5C440E2       90
   0B8A E2E640F2C540C1D9       90
   0B92 C540C2D6E3C840D6       90
   0B9A C6C64B                 90
   0B9D D6C6C64B        0BA0   91 OFF      DC    CL04'OFF.'
   0BA1 D6D5404B        0BA4   92 ON       DC    CL04'ON .'
   0BA5 3C 54 0A95             93 INS6    MVI   DSKTYP,X'54'   SET FLAG FOR 5444 INPUT SOURCE     *GC*
   0BA9 F2 87 4D               94         J     DSKM33+1       JUMP TO COMMON ENTRY POINT         *GC*
   0BAC 3C 33 0A95             95 INS5    MVI   DSKTYP,X'33'   SET FLAG FOR 3340 INPUT SOURCE     *GC*
   0BB0 C0 87 021A             96         B     PRINT          PRINT                              *GPC*
   0BB4 07              0BB4   97         DC    XL1'07'              MESSAGE                      *GPC*
   0BB5 38              0BB5   98         DC    AL1(DSKM33-DSKM32)        TO                      *GPC*
   0BB6 0BF8            0BB7   99         DC    AL2(DSKM33)                  LOAD                 *GPC*
   0BB8 C0 87 0222            100         B     HALT           HALT                 DRIVE 2       *GPC*
   0BBC 89FF            0BBD  101         DC    XL2'89FF'           THEN RESTART                 *GPC*
   0BBE F2 87 38              102         J     DSKM33+1    JUMP AROUND MESSAGE DC                *GPC*
                        0BC0  103 DSKM32   EQU   *-1                                             *GPC*
   0BC1 40D7D3C1C3C540E2 0BD3 104         DC    CL19' PLACE SYSTEM PACK '                        *GPC*
   0BC9 E8E2E3C5D440D7C1      104
   0BD1 C3D240                104
   0BD4 D6D549C4D9C9E5C5 0BF8 105 DSKM33   DC    CL37'ON DRIVE 2.  MAKE READY.  RESET HALT.'
   0BDC 40F24B4040D4C1D2      105
   0BE4 C540D9C5C1C4E848      105
   0BEC 4040D9C5E2C5E340      105
   0BF4 C8C1D3E348            105
```

FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          106 ********** PRINT OPTIONS  SECTION    END    ****************************
                          107
   0BF9 3D F0 2004        108         CLI   XKFCX,C'0'          TEST FOR DECK FC0
   0BFD F2 81 0D          109         JE    SET9S               IF SO, SET FOR 9 SECTORS
   0C00 3C 11 0EDF        110 SET17S  MVI   NUMSEC+1,X'11'      SET FOR 17 SECTORS
   0C04 0C 01 0EB2 184E   111         MVC   NOSPN(2),S17        SET # SECTORS IN MESSAGE
   0C0A F2 87 0A          112         J     TM15
   0C0D 3C 09 0EDF        113 SET9S   MVI   NUMSEC+1,X'09'      SET FOR 9 SECTORS
   0C11 0C 01 0EB2 184C   114         MVC   NOSPN(2),S9
   0C17 0C 00 0EE6 0EDF   115 TM15    MVC   SCNTS+1(1),NUMSEC+1 SET NO. SECTORS IN CNT
   0C1D 38 20 0A11        116         TBN   ID14-1,X'20'        IS 32XX INSTALLED
   0C21 F2 10 68          117         JT    CARDIN              JUMP IF SO
                          118
   0C24 3C D9 186A        119 ASKFR   MVI   M8MG2-1,C'R'        SET MESSAGE FOR REMOVABLE
   0C28 3C F1 188B        120         MVI   M8MG3,C'1'
   0C2C C0 87 021A        121         B     PRINT               GO PRINT MESSAGE
   0C30 01          0C30  122         DC    XL1'01'
   0C31 3C          0C31  123         DC    IL1'60'
   0C32 188B        0C33  124         DC    AL2(M8MG3)
   0C34 3C C6 186A        125         MVI   M8MG2-1,C'F'        SET MESSAGE FOR FIXED
   0C38 3C F0 188B        126         MVI   M8MG3,C'0'
   0C3C C0 87 021A        127         B     PRINT               PRINT AGAIN
   0C40 01          0C40  128         DC    XL1'01'
   0C41 3C          0C41  129         DC    IL1'60'
   0C42 188B        0C43  130         DC    AL2(M8MG3)
                          131
   0C44 C0 87 021A        132 M8EXIT  B     PRINT               PRINT MESSAGE TO RESET HALT
   0C48 06          0C48  133         DC    XL1'06'
   0C49 16          0C49  134         DC    IL1'22'
   0C4A 18A1        0C4B  135         DC    AL2(M8MG4)
   0C4C C0 87 0222        136         B     HALT                HALT TO ALLOW SWITCH SETTING
   0C50 89FF        0C51  137         DC    XL2'89FF'           HALT ********FF********
                          138
   0C52 30 00 1129        139         SNS   WORK,X'00'          READ SWITCHES
   0C56 3B F0 1129        140         SBF   WORK,X'F0'          RESET HI BITS OF LO CHAR
   0C5A 3D 00 1129        141         CLI   WORK,0              WAS SWITCH SET TO ZERO?
   0C5E F2 81 79          142         JE    SETF1               IF SO, SET F1
   0C61 3D 01 1129        143         CLI   WORK,1              WAS SWITCH SET TO 1
   0C65 C0 01 0C24        144         BNE   ASKFR               IF NOT, REPEAT MESSAGE
   0C69 0C 15 1825 18A1   145         MVC   OVLMSG-2(22),M8MG4  FIX UP MESSAGE FOR MODEL 8/10
                          146
   0C6F C0 87 021A        147         B     PRINT               PRINT INSTRUCTIONS
   0C73 01          0C73  148         DC    XL1'01'
   0C74 17          0C74  149         DC    IL1'23'
   0C75 17F8        0C76  150         DC    AL2(XMSG4+22)
   0C77 C0 87 021A        151         B     PRINT
   0C7B 06          0C7B  152         DC    XL1'06'
   0C7C 28          0C7C  153         DC    IL1'40'
   0C7D 1825        0C7E  154         DC    AL2(OVLMSG-2)
   0C7F C0 87 0222        155         B     HALT                HALT TO ALLOW DIS CHANGE
   0C83 89F0        0C84  156         DC    XL2'89F0'           HALT ********F0********
                          157
   0C85 3C 8B 0CF4        158         MVI   SBX,X'8B'           SET TO SET BIT OFF
   0C89 F2 87 52          159         J     SETFIL              GO SET UP TABLE
                          160
   0C8C C2 01 175A        161 CARDIN  LA    XMSG1,XR1
   0C90 3A 80 10C6        162         SBN   ERASE,X'80'           ERASE THE 32XX CRT
   0C94 C0 87 0FCB        163         B     PT5471      R1 OR F1?
   0C98 C0 87 10DB        164         B     INPUTA
   0C9C C0 87 0F50        165         B     SCANIN
   0CA0 C0 04 0C8C        166         BNP   CARDIN
   0CA4 35 01 0F48        167         L     SYNPTR,XR1
   0CA8 1D 01 1775 00     168         CLC   R1,0(,XR1)
   0CAD F2 81 0C          169         JE    SETR1
   0CB0 1D 01 1778 00     170         CLC   F1,0(,XR1)
   0CB5 F2 81 22          171         JE    SETF1
   0CB8 C0 87 0C8C        172         B     CARDIN
                          173 *
```


FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0CBC 3C 8B 0CF4        174 SETR1   MVI   SBX,X'8B'           SET BIT OFF
   0CC0 3D 33 0A95        175         CLI   DSKTYP,X'33'        3340?
   0CC4 F2 81 17          176         JE    SETFIL              IF SO, SKIP MESSAGE
   0CC7 3A 80 10C6        177         SBN   ERASE,X'80'           ERASE THE 32XX CRT
   0CCB C2 01 17E2        178         LA    XMSG4,XR1           SYSTEM PACK IS R1                    @GC@
   0CCF C0 87 0FCB        179         B     PT5471
   0CD3 C0 87 10DB        180         B     INPUTA
   0CD7 F2 87 04          181         J     SETFIL
   0CDA 3C BA 0CF4        182 SETF1   MVI   SBX,X'BA'           SET BIT ON
   0CDE C2 02 1828        183 SETFIL  LA    QBTBL-1,XR2
   0CE2 36 02 1172        184 SETAGN  A     TWO,XR2
   0CE6 34 02 0CFA        185         ST    QBPTR,XR2
   0CEA B5 02 00          186         L     0(,XR2),XR2
   0CED 36 02 1170        187         A     ONE,XR2
   0CF1 F2 81 08          188         JZ    SETDN
   0CF4 BB 08 00          189         SBF   0(,XR2),X'08'       SBN OR SBF
                    0CF4  190 SBX     EQU   *-3
   0CF7 C2 02 0000        191         LA    *-*,XR2
                    0CFA  192 QBPTR   EQU   *-1
   0CFB C0 87 0CE2        193         B     SETAGN
                    0CFF  194 SETDN   EQU   *
   0CFF 38 20 0A11        195         TBN   IC14-1,X'20'        IS 32XX INSTALLED?
   0D03 F2 10 A1          196         JT    M15                 JUMP IF SO
   0D06 C0 87 021A        197 ASK     B     PRINT               ASK ABOUT FILE NAME
   0D0A 01          0D0A  198         DC    XL1'01'
   0D0B 48          0D0B  199         DC    IL1'72'
   0D0C 18E9        0D0D  200         DC    AL2(M8MG5)
   0D0E C0 87 021A        201         B     PRINT
   0D12 01          0D12  202         DC    XL1'01'
   0D13 1D          0D13  203         DC    IL1'29'
   0D14 1906        0D15  204         DC    AL2(M8MG5B)
   0D16 C0 87 021A        205         B     PRINT               PRINT RESET HALT
   0D1A 06          0D1A  206         DC    XL1'06'
   0D1B 16          0D1B  207         DC    IL1'22'
   0D1C 18A1        0D1D  208         DC    AL2(M8MG4)
                          209
   0D1E C0 87 0222        210         B     HALT                WAIT FOR SWITCHES TO BE SET
   0D22 89FF        0D23  211         DC    XL2'89FF'           HALT ********FF********
                          212
   0D24 30 00 1129        213         SNS   WORK,X'00'          READ OUT DATA SWITCHES
   0D28 3B F0 1129        214         SBF   WORK,X'F0'          RESET HI BITS
   0D2C 3D 01 1129        215         CLI   WORK,1              TEST LO SW = 1
   0D30 F2 81 A1          216         JE    DEFLT               JUMP IF SO, TAKE DEFAULT NAME
   0D33 3D 00 1129        217         CLI   WORK,0              TEST LO SW = 0
   0D37 C0 01 0D06        218         BNE   ASK                 GO REPEAT QUESTIONS
                          219
   0D3B C0 87 021A        220         B     PRINT               GO PRINT INSTRUCTIONS
   0D3F 01          0D3F  221         DC    XL1'01'
   0D40 43          0D40  222         DC    IL1'67'
   0D41 1949        0D42  223         DC    AL2(M8MG6)
   0D43 C0 87 021A        224         B     PRINT
   0D47 01          0D47  225         DC    XL1'01'
   0D48 31          0D48  226         DC    IL1'49'
   0D49 19A5        0D4A  227         DC    AL2(M8MG7A)
   0D4B C0 87 021A        228         B     PRINT
   0D4F 06          0D4F  229         DC    XL1'06'
   0D50 2B          0D50  230         DC    IL1'43'
   0D51 1974        0D52  231         DC    AL2(M8MG7)
                          232
   0D53 0C 05 1752 1759   233         MVC   MLTAF(6),BLANK      BLANK OUT FILE NAME
   0D59 3C F1 0D66        234         MVI   ENHLT,X'F1'         INITIALIZE HALT TO F1
   0D5D C2 02 174D        235         LA    MLTAF-5,XR2         GET HI ADDR OF FILE NAME
                          236
   0D61 C0 87 0222        237 SWHLT   B     HALT                HALT TO ALLOW DATA ENTRY
   0D65 89F1        0D66  238 ENHLT   DC    XL2'89F1'           HALTS ********F1-F6********
                          239
   0D67 30 00 1129        240         SNS   WORK,X'00'          READ SWITCHES
   0D6B 8C 00 00 1129     241         MVC   0(1,XR2),WORK       MOVE SW 3,4 TO FILE NAME
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   0D70 3D 40 1129                242         CLI   WORK,X'40'          WAS CHAR A BLANK
   0D74 F2 81 11                  243         JE    NAME               DONE IF SO
   0D77 0E 00 0D66 1170           244         ALC   ENHLT(1),ONE        INCREMENT HALT
   0D7D E2 02 01                  245         LA    1(,XR2),XR2        INCREMENT TO NEXT CHAR
   0D80 3D F7 0D66                246         CLI   ENHLT,X'F7'        AT END?
   0D84 C0 01 0D61                247         BNE   SWHLT              IF NOT, GO HALT FOR NEXT CHAR
                                  248
   0D88 0C 05 19C3 1752           249 NAME    MVC   MSMG8A(6),MLTAF    MOVE NAME TO MESSAGE
   0D8E C0 87 021A                250         B     PRINT              PRINT MESSAGE
   0D92 01              0D92      251         DC    XL1'01'
   0D93 35              0D93      252         DC    IL1'53'
   0D94 19DA            0D95      253         DC    AL2(MSMG8)
                                  254         B     PRINT
   0D96 C0 87 021A
   0D9A 06              0D9A      255         DC    XL1'06'
   0D9B 16              0D9B      256         DC    IL1'22'
   0D9C 18A1            0D9D      257         DC    AL2(MSMG4)
                                  258
   0D9E C0 87 0222                259         B     HALT               HALT TO ALLOW CHECK OF NAME
   0DA2 89F0            0DA3      260         DC    XL2'89F0'          HALT  *****F0******
   0DA4 F2 87 62                  261         J     OPEN               GO OPEN FILE NOW
                                  262 *
   0DA7 C2 01 177E                263 M15     LA    XMSG2,XR1
   0DAB 3A 80 10C6                264         SBN   ERASE,X'80'          ERASE THE 32XX CRT
   0DAF 3A 80 10CC                265         SBN   BUFLG,X'80'          SET BUFFER FLAG
   0DB3 C0 87 0FCB                266         B     PT5471
   0DB7 C2 01 17B3                267         LA    XMSG3,XR1
   0DBB C0 87 0FCB                268         B     PT5471
   0DBF 3B 80 10CC                269         SBF   BUFLG,X'80'          RESET BUFFER FLAG
   0DC3 0F 01 10CE 10CE           270         SLC   BUFF8(2),BUFF8       RESET BUFFER ADDRESS TO ZERO
   0DC9 C0 87 10DB                271         B     INPUTA
   0DCD C0 87 0F50                272         B     SCANIN
   0DD1 F2 84 0F                  273         JP    NODFT
   0DD4 0C 05 1752 0DE2           274 DEFLT   MVC   MLTAF(6),DFTN
   0DDA F2 87 2C                  275         J     OPEN
   0DDD 5B5EC4C3D9C9    0DE2      276 DFTN    DC    CL6'$$NCRI'
                                  277 *
   0DE3 3D 05 0F49                278 NODFT   CLI   LENGTH,5
   0DE7 C0 84 0CFF                279         BH    SETDN
   0DEB 0C 05 1752 1759           280         MVC   MLTAF,BLANK
   0DF1 0C 00 0E07 0F49           281         MVC   MVCF(1),LENGTH
   0DF7 0C 00 0E06 0F49           282         MVC   MVCL(1),LENGTH
   0DFD C2 02 174D                283         LA    MLTAF-5,XR2
   0E01 38 01 0F48                284         L     SYMPTR,XR1
   0E05 9C 03 00 00               285         MVC   *-*(,XR2),0(,XR1)
                        0E06      286 MVCL    EQU   *-3
                        0E07      287 MVCF    EQU   *-2
                                  288 ********************************************************************
                                  289 **                        OPEN    FILE                        **
                                  290 ********************************************************************
   0E09 0C 01 1175 174C           291 OPEN    MVC   DSKSEC(2),CS0008
   0E0F C0 87 114E                292         B     READ
   0E13 1C 01 1175 26             293         MVC   DSKSEC(2),38(,XR1)   READ CYL/SEC 0008  VOL LABEL
   0E18 C0 87 114E                294 RDNXT   B     READ                 SET CYL/SEC  XXYY  VTOC INDEX
   0E1C 3C 0C 1753                295         MVI   CNT,12
   0E20 7D FF 00                  296 OPEN1   CLI   0(,XR1),X'FF'          CHECK FOR END OF DIRECTORY
   0E23 F2 81 27                  297         JE    NOTOPN
   0E26 4D 05 C6 1752             298         CLC   6(6,XR1),MLTAF           FIND 32XX MICRO-CODE FILE
   0E2E D2 01 15                  299         JE    FILFND
   0E31 0F 00 1753 1170           300         LA    21(,XR1),XR1
   0E37 C0 01 0E20                301         SLC   CNT,ONE
   0E3B 0E 01 1175 117A           302         BNZ   OPEN1
   0E41 38 60 1175                303 XLC     ALC   RDDFC+2(2),ONESEC
   0E45 C0 10 0E3B                304         TBN   RDDFC+2,X'60'
   0E49 C0 87 0E18                305         BT    XLC
   0E4D C0 87 021A                306         B     RDNXT
   0E51 C7                        307 NOTOPN  B     PRINT
                        0E51      308         DC    XL1'C7'
   0E52 2E              0E52      309         DC    IL1'46'
```



```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   0E53 0EA2                      0E54 310         DC    AL2(NOFIL)
   0E55 89F9                      0E56 311         DC    XL2'89F9'
   0E57 C0 87 0222                     312         B     HALT
   0E5B 89F9                      0E5C 313         DC    XL2'89F9'          ERROR * F9 **************************
   0E5D C0 87 0216                     314         B     LINK
   0E61 C0 87 021A                     315 NOSP    B     PRINT
   0E65 C7                        0E65 316         DC    XL1'C7'
   0E66 36                        0E66 317         DC    IL1'54'
   0E67 0ED8                      0E68 318         DC    AL2(NOSPC)
   0E69 89F7                      0E6A 319         DC    XL2'89F7'
   0E6B C0 87 0222                     320         B     HALT               ERROR * F7 **************************
   0E6F 89F7                      0E70 321         DC    XL2'89F7'
   0E71 C0 87 0216                     322         B     LINK
   0E75 C3D6E4D3C440D5D6 0EA2         323 NOFIL  DC    CL46'COULD NOT FIND MICRO-CODE OBJECT FILE ON DISK'
   0E7D E340C6C9D5C440D4              323
   0E85 C9C3D9D660C3D6C4              323
   0E8D C540D6C2D1C5C3E3              323
   0E95 40C6C9D3C540D6D5              323
   0E9D 40C4C9E2D240                  323
                        0EB2      324 NOSPN  EQU   *+15
   0EA3 E3C8C5D9C540C1D9 0ED4         325         DC    CL50'THERE ARE NOT XX SECTORS ALLOCATED TO MICRO-CODE '
   0EAB C540D5D6E340E7E7              325
   0EB3 40E2C5C3E3D6D9E2              325
   0EBB 40C1D3D3D6C3C1E3              325
   0EC3 C5C440E3D640D4C9              325
   0ECB C3D9D660C3D6C4C5              325
   0ED3 4040                          325
   0ED5 C6C9D3C5          0ED8        326 NOSPC  DC    CL4'FILE'
```

FC80 MOVE FC7 MICRC-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          0ED9  331 FILFND EQU   *                 32XX MICRO-CODE FILE FOUND
 0ED9 1C 01 1175 08             332         MVC   DSKSEC(2),8(,XR1)  SET DISK SECTOR FOR FILE DESP.
 0EDE 7D 00 14                  333 NUMSEC  CLI   20(,XR1),*-*       CHECK FOR 9 OR 17 SECTORS
 0EE1 C0 82 0E61                334         BL    NOSP
                                335 *
 0EE5 3C 00 1753                336 SCNTS   MVI   CNT,*-*           SET COUNT TO 9 OR 17
 0EE9 35 01 2001                337         L     TABLE,XR1         GET MICRO CODE ADDRESS IN XR1
 0EED 34 01 0EF6                338         ST    MVCF8,XR1
 0EF1 0C FF 174A 0000           339 MVCC    MVC   DBUF+255(256),*-*
                          0EF6  340 MVCF8   EQU   *-1
 0EF7 C0 87 112C                341         B     WRITE
 0EFB 0F 01 0EF6 112B           342         SLC   MVCF8(2),NG256
 0F01 0F 00 1753 1170           343         SLC   CNT,ONE
 0F07 C0 01 0EF1                344         BNZ   MVCC
 0F0B C0 87 021A                345         B     PRINT
 0F0F 07                  0F0F  346         DC    XL1'07'
 0F10 2A                  0F10  347         DC    IL1'42'
 0F11 0F40                0F12  348         DC    AL2(NOMSG)
 0F13 C0 87 0216                349         B     LINK
 0F17 D4C9C3D9D660C3D6    0F40  350 NOMSG   DC    CL42'MICRO-CODE HAS BEEN COPIED TO SYSTEM PACK'
 0F1F C4C540C8C1E240C2          350
 0F27 C5C5D540C3D6D7C9          350
 0F2F C5C440E3D640E2E8          350
 0F37 E2E3C5D440D7C1C3          350
 0F3F D240                      350
                                351
                                351
                                351
                                352 ************************************************************************
                                353 *  SCANIN *                                                            *
                                354 ***********                                                            *
                                355 *                                                                      *
                                356 *  SCANIN  PICK UPS A SYMBOL IN A BUFFER. BLANK AND COMMA ARE          *
                                357 *  DELIMITERS THAT TERMINATES THE ROUTINE.                             *
                                358 *                                                                      *
                                359 *                                                                      *
                                360 *                                                                      *
                                361 *                                                                      *
                                362 *  SCANIN PARAMETERS                                                   *
                                363 *                    **********************                            *
                                364 *       INPUT0     * START @  OF BUFFER *                            *
                                365 *       INPUTN     * END    @  OF BUFFER *                            *
                                366 *       NXTSTR     * NEXT START @       *                            *
                                367 *       SYMPTR     * PTR TO SYMBOL      *                            *
                                368 *       LENGTH     * LENGTH OF SYMBOL-1 *                            *
                                369 *                    **********************                            *
                                370 *         ON EXIT:  NXTSTR, SYMPTR, LENGTH WILL BE SET ALONG WITH    *
                                371 *                   THE CONDITON REG. AS FOLLOWS:                    *
                                372 *                         NEG -  END OF INPUT (EOI)                  *
                                373 *                         ZERO-  NULL SYMBOL                         *
                                374 *                         POS -  SYMBOL FOUND                        *
                                375 ************************************************************************
                                376
                                376
 0F41 0A13                0F42  377 INPUT0  DC    AL2(INPUT+1-LNG)
 0F43 0A1C                0F44  378 INPUTN  DC    AL2(INPUT)
 0F45 0A13                0F46  379 NXTSTR  DC    AL2(INPUT+1-LNG)
 0F47 0000                0F48  380 SYMPTR  DC    AL2(*-*)
 0F49 00                  0F49  381 LENGTH  DC    IL1'0'
 0F4A 00C2                0F4B  382 NEG     DC    XL2'02'
 0F4C 0004                0F4D  383 POS     DC    XL2'04'
 0F4E 0001                0F4F  384 XNE     DC    IL2'1'
                          0004  385 PSR     EQU   4
                                386
 0F50 C2 31 0F42                387 SCANIN LA     INPUT0,XR1
```


FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          0F42  388         USING INPUT0,XR1
 0F54 74 08 78                  389         ST    SCANEX(,XR1),ARR
                                390 SCAN1   L     NXTSTR(,XR1),XR2
 0F57 75 02 04                  391         MVI   LENGTH(,XR1),X'FF'
 0F5A 7C FF 07                  392         CLC   NXTSTR(,XR1),END(2)
 0F5D 4D 01 04 0A1F             393         JH    EOI
 0F62 F2 84 60                  394         CLI   0(,XR2),C' '          SKIP LEADING  BLANK(S)
 0F65 8D 40 00                  395         JNE   SCAN2
 0F68 F2 01 07                  396         ALC   NXTSTR(,XR1),XNE(,XR1)
 0F6B 5E 01 04 0D               397         B     SCAN1(,XR1)
 0F6F D0 87 15                  398
                                399 SCAN2   CLC   NXTSTR(,XR1),END(2)     FIND LAST CHAR OF SYMBOL
 0F72 4D 01 04 0A1F             400         JH    SCAN3
 0F77 F2 84 1C                  401         CLI   0(,XR2),C' '          TERMINATE ON BLANK OR .
 0F7A 8D 40 00                  402         JE    SCAN3
 0F7D F2 81 16                  403         CLI   0(,XR2),C'.'
 0F80 8D 6B 00                  404         JE    SCAN3
 0F83 F2 81 10                  405         ALC   LENGTH(,XR1),XNE(,XR1)
 0F86 5E 00 07 0D               406         ST    SYMPTR(,XR1),XR2
 0F8A 74 02 06                  407         LA    1(,XR2),XR2
 0F8D E2 02 01                  408         ST    NXTSTR(,XR1),XR2
 0F90 74 02 04                  409         B     SCAN2(,XR1)
 0F93 D0 87 30                  410
                          0F96  411 SCAN3   EQU   *
                                412
                                413 SCAN4   L     NXTSTR(,XR1),XR2      SKIP TO NEXT CHAR AFTER . OR
 0F96 75 02 04                  414         CLC   NXTSTR(,XR1),END(2)   EOI AND SET NXTSTR
 0F99 4D 01 04 0A1F             415         JH    SCAN51
 0F9E F2 84 10                  416         CLI   0(,XR2),C' '
 0FA1 8D 40 00                  417         JE    SCAN6
 0FA4 F2 81 17                  418         CLI   0(,XR2),C'.'
 0FA7 8D 6B 00                  419         JNE   SCAN51
 0FAA F2 01 04                  420         ALC   NXTSTR(,XR1),XNE(,XR1)
 0FAD 5E 01 04 0D               421 SCAN51  CLI   LENGTH(,XR1),X'FF'
 0FB1 7D FF 07                  422         JE    SCAN5
 0FB4 F2 81 03                  423         L     POS(,XR1),PSR
 0FB7 75 04 08                  424 SCAN5   B     *-*
 0FBA C0 87 0000          0FBD  425 SCANEX  EQU   *-1
                                426
 0FBE 5E 01 04 0D               427 SCAN6   ALC   NXTSTR(,XR1),XNE(,XR1)
 0FC2 D0 87 54                  428         B     SCAN4(,XR1)
                                429
 0FC5 75 04 09                  430 EOI     L     NEG(,XR1),PSR
 0FC8 D0 87 78                  431         B     SCAN5(,XR1)
                                432
                                432
                                432
 0FCB 34 08 0FD6                433 PT5471  ST    PTX8,ARR
 0FCF C0 87 0FD7                434         B     DISPLY
 0FD3 C0 87 0000                435 PTEXT   B     *-*
                          0FD6  436 PTX8    EQU   *-1
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              438 ********************************************************************************
                              439 * DISPLY  *     32XX  DISPLAY ROUTINE TO DISPLAY MESSAGES                      *
                              440 ************
                              441 *                 ON THE 32XX CRT                                              *
                              442 *                                                                              *
                              443 *    ON ENTRANCE:1XP1 POINTS TO MESSAGE                                        *
                              444 *                                                                              *
                              445 *    ON EXIT:1XR1 WILL POINT TO A 0 OR 1 IN THE MESSAGE                        *
                              446 *                                                                              *
                              447 ********************************************************************************
                              448
                              448
 0FD7 38 FF 0879              449 DISPLY TBN   CRTFLG,X'FF'        TEST FOR MICROCODE LOADED
 0FDB F2 10 06                450        JT    **9
                              451
 0FDE C0 87 0222              452        B     HALT
 0FE2 89E7            0FE3    453        DC    XL2'89E7'           MICRO CODE NOT LOADED ERROR
 0FE4 3C FF 0879              454        MVI   CRTFLG,X'FF'          HALT - E7 ************************
                              455                                   HALT ONLY ONCE
 0FE8 C1 18 0FEF              456        TIO   MAKRDY,NRDY         TEST FOR 32XX ATTACHMENT NOT READY
 0FEC F2 87 0C                457        J     RDY
                              458
 0FEF F3 18 80                459 MAKRDY SIO   X'80',SIOI         DISABLE THE MICRO CONTROLLER
 0FF2 F3 18 E0                460        SIO   X'E0',SIOI         ENABLE
 0FF5 0D 63 0FF5 0FF5         461        CLC   *(100),*
                              462
 0FFB 38 80 10C6              463 RDY    TBN   ERASE,X'80'         TEST FOR ERASE FLAG
 0FFF F2 90 42                464        JF    PT32XX              DON'T ERASE THE 32XX CRT
                              465
 1002 35 C0 10DA              466        L     RESET8,IAR1         RESET ANY PRIOR PENDING CONDITIONS
 1006 F3 18 01                467        SIO   X'01',SIOI          ENABLE INTERRUPTS
                              468
 1009 35 C0 10D5              469        L     INT8,IAR1           POINT TO THE INTERRUPT SUBROUTINE
 100D F3 10 C1                470        SIO   X'C1',X'10'         ERASE THE 32XX CRT
 1010 C0 87 1092              471        B     INTAKN              LOOP UNTIL AN INTERRUPT
 1014 3B 80 10C6              472        SBF   ERASE,X'80'         RESET THE ERASE FLAG
                              473
                              474 *      THE FOLLOWING  CODING     WILL WRITE 480 BLANKS
                              475 *      TO THE 32XX BUFFER TO GET RID OF ANY
                              476 *      ATTRIBUTE CHARACATERS LEFT FROM OTHER
                              477 *      PROGRAMS
                              478
 1018 F2 07 29                479 PASOVR JC    PT32XX,X'07'        BYPASS THE FOLLOWING AFTER 1ST PASS
 1018 3C 06 10C7              480        MVI   BLKCNT,X'06'        SET COUNTER TO 6
 101F 31 10 10CE              481        LIO   BUFF8,X'10'         LOAD BUFFER ADDRESS REGISTER
 1023 31 1B 10D3              482 NXTLNE LIO   DATA8,X'1B'         LOAD MAIN STORAGE DATA ADDR REGISTER
 1027 31 12 10C9              483        LIO   COUNT,X'12'         LOAD COUNT REGISTER
 102B 35 C0 10D5              484        L     INT8,IAR1           POINT TO INTERRUPT SUBROUTINE
 102F F3 10 91                485        SIO   X'91',X'10'         WRITE TWO LINES OF BLANKS
 1032 C0 87 1092              486        B     INTAKN              LOOP UNTIL AN INTERRUPT
 1036 0F 00 10C7 1170         487        SLC   BLKCNT,ONE          SUBTRACT ONE FROM BLANK COUNTER
 103C C0 01 1023              488        BNZ   NXTLNE              GO WRITE TWO MORE LINES OF BLANKS
 1040 3C 87 1019              489        MVI   PASOVR+1,X'87'      INDICATE 1ST PASS THROUGH
                              490
                              491 *      END OF WRITE 480 BLANKS
                              492
 1044 3C 40 08FF              493 PT32XX MVI   X'08FF',C' '        BLANK INPUT BUFFER
 1048 0C 82 08FE 08FF         494        MVC   X'08FE'(131),X'08FF' BLANK INPUT BUFFER
 104E C2 02 0880              495        LA    DCPBUF,XR2          POINT TO 1ST POSITION OF DCP BUFFER
 1052 9C C0 C0 00             496 PT32   MVC   0(,XR2),0(,XR1)     MOVE CHARACTER TO BUFFER
 1056 D2 01 01                497        LA    1(,XR1),XR1         POINT TO NEXT CHARACTER
 1059 7D 00 00                498        CLI   0(,XR1),0           END OF MESSAGE ?
 105C F2 81 07                499        JE    LOADMS              JUMP IF YES
 105F E2 02 01                500        LA    1(,XR2),XR2         POINT TO NEXT POSITION IN DCP BUFFER
 1062 C0 87 1052              501        B     PT32
 1066 31 1B 10D3              502 LOADMS LIO   DATA8,X'1B'         LOAD MAIN STORAGE ADDR REGISTER
 106A 31 10 10CE              503        LIO   BUFF8,X'10'         LOAD MESSAGE ADDR REGISTER
 106E 31 12 10C9              504        LIO   COUNT,X'12'         LOAD REGISTER
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1072 31 15 10D1              505        LIO   POSCSR,X'15'        LOAD CURSOR POSITION REGISTER
 1076 35 C0 10D5              506        L     INT8,IAR1           POINT TO INTERRUPT ROUTINE
 107A F3 10 91                507        SIO   X'91',X'10'         WRITE TO THE 32XX CRT
 107D C0 87 1092              508        B     INTAKN              LOOP UNTIL AN INTERRUPT
 1081 38 80 10CC              509        TBN   BUFLG,X'80'       TEST FOR INCREMENTING BUFFER ADDR
 1085 F2 90 06                510        JF    **9                 JUMP IF NO
 1088 0E 01 10CE 10C9         511        ALC   BUFF8(2),COUNT      POINT TO LINE 3 ON THE 32XX SCREEN
 108E C0 87 0FD3              512        B     PTEXT
                              513
                              513
                              514 ********************************************************************************
                              515 *              THIS SUBROUTINE CHECKS FOR AN INTERRUPT                         *
                              516 *              TAKEN.    IT CHECKS FOR THE 32XX BEING                          *
                              517 *              NOT READY OR A 32XX UNIT ERROR. ON EXIT,                        *
                              518 *              IT RESETS THE INTERRUPT AND ERASE FLAG                          *
                              519 ********************************************************************************
                              520
                              520
 1092 34 08 10AC              521 INTAKN ST    ENDINT+3,ARR         SAVE RETURN
 1096 36 60 10D6              522 INTERR TBN   INTFLG,X'80'         INTERRUPT TAKEN ?
 109A C0 90 1096              523        BF    INTERR               LOOP UNTIL AN INTERRUPT
 109E 3B 80 10D6              524        SBF   INTFLG,X'80'         RESET THE INTERRUPT FLAG
 10A2 39 08 10D7              525        TBF   STATUS-1,X'08'       ANY 32XX ERROR OR NOT READY?
 10A6 F2 90 04                526        JF    ERROR
 10A9 C0 87 0000              527 ENDINT B     *-*                  RETURN
                              528
                              528
                              528 ********************************************************************************
                              530 *                    32XX ERROR SUBROUTINE                                     *
                              531 ********************************************************************************
 10AD C0 87 0222              532 ERRCR  B     HALT                 ERROR HALT
 10B1 89E8            10B2    533        DC    XL2'89E8'             HALT -E8-**************************
 10B3 C0 87 0C8C              534        B     CARDIN               START OVER AGAIN
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          536 ********************************************************************************
                          537 *                32XX INTERRUPT SUBROUTINE USED TO                             *
                          538 *                SET THE INTERRUPT FLAG. SENSE THE                             *
                          539 *                INTERRUPT CONDITION REGISTER AND                              *
                          540 *                RESET AND DISABLE INTERRUPTS                                  *
                          541 ********************************************************************************
 10B7 3A 80 10D6          542 PENDNG SBN    INTFLG,X'80'          SET INTERRUPT FLAG
 10B8 30 16 10D8          543        SNS    STATUS,X'16'          SENSE THE INTERRUPT CONDITION REG
 10BF F3 18 03            544 RESET  SIO    X'03',SIOI            RESET AND ENABLE INTERRUPTS
 10C2 C0 87 10BF          545        B      RESET                 LOOP UNTIL NO INTERRUPT PENDINGS
                          546
                          547 ********************************************************************************
                          548 *          32XX EQUATES AND CONSTANTS                                           *
                          549 ********************************************************************************
 10C6 00          10C6    550 ERASE  DC     XL1'00'               ERASE FLAG
 10C7 00          10C7    551 BLKCNT DC     XL1'00'               BLANK LINE COUNTER
 10C8 0050        10C9    552 COUNT  DC     IL2'80'               COUNT REGISTER LENGTH = 80
 10CA 0009        10CB    553 COUNT9 DC     IL2'09'               COUNT REGISTER LENGTH = 09
 10CC 00          10CC    554 BUFLG  DC     XL1'00'               BUFFER FLAG
 10CD 0000        10CE    555 BUFF@  DC     IL2'00'               BUFFER ADDRESS REGISTER
 10CF C00190      10D1    556 POSCSR DC     IL3'400'              CURSOR POSITION REGISTER
 10D2 0880        10D3    557 DATA@  DC     AL2(DCPBUF)           MAIN STORE REGISTER
 10D4 10B7        10D5    558 INT@   DC     AL2(PENDNG)           ADDRESS OF 32XX INTERRUPT ROUTINE
 10D6 00          10D6    559 INTFLG DC     XL1'00'               INTERRUPT FLAG
 10D7 0000        10D8    560 STATUS DC     XL2'00'               32XX INTERRUPT CONDITION REGISTER
 10D9 10BF        10DA    561 RESET@ DC     AL2(RESET)            ADDRESS OF 32XX RESET ROUTINE
 0880             0880    562 DCPBUF EQU    X'0880'               DCP BUFFER ADDRESS
 0018             0018    563 SIOI   EQU    X'18'                 SIO IMMEDIATE
 0879             0879    564 CRTFLG EQU    X'0879'               INDICATE MICROCODE LOADED
 0018             0018    565 NRDY   EQU    X'18'                 32XX ATTACHMENT NOT READY
                          566
                   10DB   567 INPUTA EQU    *
                          568 ********************************************************************************
                          569 * INPUT5*     SUBROUTINE TO INPUT FROM 32XX INTO A -LNG- BYTE BUFFER           *
                          570 *********     EACH INPUT CHAR IS DISPLAYED ON THE 32XX CRT                     *
                          571 ********************************************************************************
                          572
                          573
 10DB 34 08 1127          574 INPUT5 ST     END5+3,ARR            SAVE RETURN ADDRESS
 10DF 3C 40 08FF          575        MVI    X'08FF',C' '          BLANK INPUT BUFFER
 10E3 0C 82 08FE 08FF     576        MVC    X'08FE'(131),X'08FF'  BLANK INPUT BUFFER
 10E9 31 12 10CB          577        LIO    COUNT9,X'12'          LOAD COUNT REGISTER
 10ED 31 1B 0F42          578        LIO    INPUT@,X'1B'          LOAD MAIN STORAGE REGISTER
 10F1 31 10 10D1          579        LIO    POSCSR,X'10'          LOAD MESSAGE BUFFER ADDRESS REGISTER
 10F5 35 C0 10D5          580 TRYAGN L      INT@,IAR1             POINT TO THE INTERRUPT ROUTINE
 10F9 F3 18 01            581        SIO    X'01',SIOI            ENABLE INTERRUPTS
 10FC F3 10 00            582        SIO    X'00',X'10'           UNLOCK THE KEYBOARD
 10FF C0 87 1092          583        B      INTAKN                LOOP UNTIL INTERRUPT
 1103 35 C0 10D5          584        L      INT@,IAR1             POINT TO THE INTERRUPT ROUTINE
 1107 C0 87 1092          585        B      INTAKN                LOOP UNTIL INTERRUPT
 1108 3D 3D 10D8          586        CLI    STATUS,X'3D'          ENTER KEY ?
 110F C0 01 10F5          587        BNE    TRYAGN                TRY AGAIN IF NOT ENTER KEY
 1113 35 C0 10D5          588        L      INT@,IAR1             POINT TO THE INTERRUPT ROUTINE
 1117 F3 10 51            589        SIO    X'51',X'10'           READ THE 32XX BUFFER
 111A C0 87 1092          590        B      INTAKN                LOOP UNTIL INTERRUPT
 111E 0C 01 0F46 0F42     591        MVC    NXTSTR(2),INPUT@
 1124 C0 87 0000          592 END5   B      *-*                   RETURN
                          593
                          594 ********************************************************************************
                          595 *       CONSTANT                                                               *
                          596 ********************************************************************************
 1128 C0C0        1129    597 WORK   DC     XL2'0'
 112A FF00        1128    598 NG256  DC     IL2'-256'
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          600 ********************************************************************************
                          601 **          DISK WRITE I/O SET-UP SECTION                                      **
                          602 ********************************************************************************
                          603
                          603
                   1159   604          USING BASE1,XR2
 112C 34 08 114D          605 WRITE  ST     WRTX@,ARR
 1130 C2 02 1159          606        LA     BASE1,XR2
 1134 E0 87 3C            607        B      STRTIO(,XR2)                SEEK TO SECTOR
 1137 08                  608 Z1     DC     XL1'8'
 1138 BC 00 1D            609        MVI    RDDFC+3(,XR2),0
 113B E0 87 3C            610        B      STRTIO(,XR2)                WRITE SECTOR
 113E 0A                  611 Z15    DC     XL1'A'
 113F AE 01 1C 21         612 ALC    ALC    RDDFC+2(2,XR2),ONESEC(,XR2) INCREMENT TO NEXT SECTOR
 1143 B8 60 1C            613        TBN    RDDFC+2(,XR2),X'60'
 1146 C0 10 113F          614        BT     ALC
 114A C0 87 0000          615        B      *-*
                   114D   616 WRTX@  EQU    *-1
                          617
                          617
                          617
                          617
                          618 ********************************************************************************
                          619 **          DISK READ  I/O SET-UP SECTION                                      **
                          620 ********************************************************************************
                          621
                          621
                          621
                          621
                   114E   622 READ   EQU    *
                   00A2   623 BUSY   EQU    X'A2'
                   00AE   624 CTLREG EQU    X'AE'
                   00A0   625 NTRDY  EQU    X'A0'
 114E C2 02 116A          626        LA     SXR2,XR2
 1152 C2 02 1159          627        LA     BASE1,XR2
                   1159   628        USING  BASE1,XR2
 1156 B4 08 15            629        ST     SARR(,XR2),ARR
                   1159   630 BASE1  EQU    *
 1159 E0 87 3C            631        B      STRTIO(,XR2)                SEEK
 115C 08                  632 Z2     DC     XL1'8'
 115D BC 00 1D            633        MVI    RDDFC+3(,XR2),0
 1160 E0 87 3C            634        B      STRTIO(,XR2)                READ COMMAND
 1163 09                  635 Z3     DC     XL1'9'
 1164 B5 01 2D            636        L      DFDR(,XR2),XR1
 1167 C2 02 0000          637        LA     *-*,XR2
                   116A   638 SXR2   EQU    *-1
 116A C0 87 0000          639        B      *-*
                   116E   640 SARR   EQU    *-1
```

```
ERR LOC OBJECT CODE      ADDR STNT SOURCE STATEMENT

                              642 ********************************************************************************
                              643 **                        DDCF FIELD                                          **
                              644 ********************************************************************************
                              645 ****   BYTE 1    ****   BYTE 2    ****   BYTE 3    ****   BYTE 4    ***
                              646 ********************************************************************************
                              647 ****   FLAG      ****  CYLINDER   ****   TRACK /   ****   NUMBER    ***
                              648 ****   BYTE      ****   BYTE      ****   SECTOR    ****   OF SECTORS *
                              649 ****             ****             ****   NUMBER    ****   OR TRACKS **
                              650 ********************************************************************************
                              651
                              651
  116F 0001           1170   652 ONE     DC    XL2'1'
  1171 0002           1172   653 TWO     DC    XL2'2'
  1173 00             1173   654 RDDFC   DC    XL1'00'   FLAG  BYTE                          ** BL *******
  1174 00             1174   655         DC    XL1'00'   CYLINDER BYTE                     **    0C    **
  1175 08             1175   656         DC    XL1'08'   TRACK & SECTOR NO. BYTE           **    KE    **
  1176 00             1176   657         DC    XL1'00'   NUMBER OF SECTORS OR TRACKS BYTE  ******** D **
  1177 0000           1178   658 SENSE   DC    XL2'0'
  1179 0004           117A   659 ONESEC  DC    XL2'4'
  117B 0000           117C   660 EXTSAV  DC    XL2'0'
  117D 117F           117E   661 RECABB  DC    AL2(**2)  ****************************
  117F 000000FF       1182   662         DC    XL4'FF'   * MUST BE TOGETHER          *
                             663 *                       ****************************
  1183 1173           1184   664 NRMDFC  DC    AL2(RDDFC)
  1185 1648           1186   665 DFDR    DC    AL2(DBUF)
                      1186   666 DBUFB   EQU   *-1
  1187 1189           1188   667 ALTCFC  DC    AL2(ARDDFC)
  1189 00             1189   668 ARDDFC  DC    XL1'0'    FLAG BYTE                       ** BL *******
  118A 00             118A   669         DC    XL1'0'    CYLINDER BYTE                   **    0C    **
  118B 00             118B   670         DC    XL1'0'    TRACK & SECTOR NO.              **    KE    **
  118C 00             118C   671         DC    XL1'0'    NUMBER OF SECTORS OR TRACKS  ******** D **
  118D 118F           118E   672 LAST@   DC    AL2(**2)  **************************** **BL *******
  118F 00             118F   673         DC    XL1'0'    * MUST BE TOGETHER  FLAG BYTE **  0C    **
  1190 00             1190   674 LASTAD  DC    XL1'0'    *                   CYL  BYTE **    KE    **
  1191 00             1191   675         DC    XL1'0'    ******************* SEC  BYTE ******* D **
  1192 00             1192   676 DSKDRV  DC    XL1'0'
  1193 1159           1194   677         DC    AL2(BASE1)
                      118D   678 RECARD  EQU   *-1-7
                      1173   679 DSKFLG  EQU   RDDFC
                      1174   680 DSKCYL  EQU   RDDFC+1
                      1175   681 DSKSEC  EQU   RDDFC+2
                      1176   682 DSKNUM  EQU   RDDFC+3
```



```
ERR LOC OBJECT CODE      ADDR STNT SOURCE STATEMENT

                              684 ********************************************************************************
                              685 *            START I/O SUBROUTINE
                              686 ********************************************************************************
                              687
                              687
                      1195    688 STRTIO EQU   *
  1195 B5 02 2B               689        L     NRMDFC(,XR2),XR2       LOAD BASE VALUE FOR START I/O
                      1173    690        USING RDDFC,2
  1198 B4 08 9F               691 STPARM ST    SETXR1(,XR2),ARR       SAVE ADDRESS RECALL REGISTER
  1198 B5 01 9F               692 LDPARM L     SETXR1(,XR2),XR1       LOAD XR1 AS PARAMETER POINTER
  119E 98 03 91 00            693        MNN   SIO+1(,XR2),0(,XR1)    SET FUNCTION CODE IN SIO
  11A2 C0 87 12BD             694        B     DISK33
                      11A6    695 DISK54 EQU   *
  11A6 B1 AE 11               696 Z14    LIO   NRMDFC(,XR2),CTLREG    LOAD CONTROL REG.
  11A9 E1 A0 E5               697        TIO   NOTRDY(,XR2),X'A0'     DISK READY?
  11AC 60 AE 05               698        SNS   SENSE(,XR2),CTLREG     SENSE THE CURRENT CTL. FLD. ADDR.
  11AF 79 07 00               699        TBF   0(,XR1),X'07'          TEST FOR SEEK
  11B2 B5 01 05               700        L     SENSE(,XR2),XR1        LOAD XR1 AS POINTER
                              701 *                                    TO DISK CONTROL FIELD.
  11B5 F2 90 48               702        JF    ADREXT                 NO. SKIP SET ADDRESS.
                              703
  11B8 B1 AE 1B               704 Z4     LIC   LAST@(,XR2),CTLREG
  11BB F3 A9 01               705 Z5     SIO   1,X'A9'                READ ID
  11BE E1 A2 4B               706        TIO   *(,XR2),BUSY
  11C1 B9 03 1C               707        TBF   LASTAD-1(,XR2),3       TEST FOR ALT. OR DEFECT. TRK
  11C4 F2 10 0C               708        JT    OK
  11C7 B1 AE 0B               709 Z6     LIC   RECABB(,XR2),CTLREG
  11CA F3 A8 00               710 Z7     SIO   0,X'A8'                RECABRIATE
  11CD E1 A2 5A               711        TIO   *(,XR2),BUSY
  11D0 BC 00 1D               712        MVI   LASTAD(,XR2),0
                      11D3    713 OK     EQU   *
  11D3 B1 AE 05               714 Z8     LIC   SENSE(,XR2),CTLREG     RESTORE CTLREG
  11D6 7C 00 03               715        MVI   3(,XR1),0              SET SEEK # TO 0
  11D9 6D 00 01 1D            716        CLC   1(,XR1),LASTAD(1,XR2)  COMPARE NEW ADDRESS WITH OLD
  11DD F2 81 20               717        JE    ADREXT                 EQUAL. SEEK NOT NECESSARY
  11E0 F2 84 0B               718        JH    FWDSEK                 NEW ADDR. HIGHER. DO FORWARD SEEK
  11E3 AC 00 87 1D            719        MVC   SCRCH(1,XR2),LASTAD(,XR2)  PLACE LAST ADDR. IN WORKAREA
  11E7 9F 00 87 01            720        SLC   SCRCH(1,XR2),1(,XR1)   SUBTRACT NEW ADDR. FROM LAST
  11EB F2 87 0B               721        J     SETADB                 PROCEED
                              722
  11EE 7A 01 02               723 FWDSEK SBN   2(,XR1),01             SET BIT ON FOR FORWARD SEEK
  11F1 9C 00 87 01            724        MVC   SCRCH(1,XR2),1(,XR1)   PLACE NEW ADDRESS IN WORK AREA
  11F5 AF 00 87 1D            725        SLC   SCRCH(1,XR2),LASTAD(,XR2)  SUBTRACT LAST ADDR. FROM NEW
                              726
                      11FA    727 SCRCH  EQU   **1
  11F9 7C 00 03               728 SETADB MVI   3(,XR1),*-*             INSERT NO. OF TRACKS TO CROSS
  11FC 9C 00 1D 01            729        MVC   LASTAD(1,XR2),1(,XR1)   SAVE NEW ADDRESS
                      1200    730 ADREXT EQU   *
                              731
  1200 B1 AC 13               732 Z9     LIO   DFDR(,XR2),X'AC'       LOAD DATA REGISTER
  1203 F3 A0 00               733 SIO    SIO   0,X'A0'                START I/O OPERATION
  1206 E1 A2 93               734        TIO   *(,XR2),BUSY           WAIT TILL COMPLETE
                              735
  1209 78 01 02               736        SBF   2(,XR1),01             TURN OFF FOR. / REV. BIT
                              737
  120C E1 A0 A7               738        TIC   DSKERR(,XR2),NTRDY     BRANCH IF ERROR
                      1212    739 SETXR1 EQU   **3
  120F C2 01 0000             740        LA    *-*,XR1                LOAD XR1 AS PARAMETER POINTER
  1213 C2 02 1159             741        LA    BASE1,XR2              LOAD XR2 AS BASE
                      1159    742        USING BASE1,2
  1217 D0 87 01               743        B     1(,XR1)                EXIT
                              744
                              744
                              745 ********************************************************************************
                              746 **     DISK ERROR SECTION                                                     **
                              747 ********************************************************************************
                              748
                              748
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1173  749        USING RDDFC,2
                         121A  750 DSKERR  EQU   *
  121A B1 AE 15                751 Z10     LIO   ALTDFC(,XR2),CTLREG   LOAD CTL. REG. TO POINT TO ALT.FLD.
  121D F3 A9 01                752 Z11     SIO   01,X'A9'              READ ID SIO
  1220 E1 A2 AD                753         TIC   *(,XR2),BUSY          DELAY TILL FINISHED
  1223 BD 02 16                754         CLI   ARDDFC(,XR2),02       TEST FOR A DEFECTIVE TRACK
  1226 F2 81 16                755         JE    SETALT                JUMP IF IT IS.
  1229 C0 87 021A              756         B     PRINT
  122D C7                 122D 757         DC    XL1'C7'
  122E 20                 122E 758         DC    IL1'32'
  122F 128C               1230 759         DC    AL2(DSKER)
  1231 89FC               1232 760         DC    XL2'89FC'
  1233 C0 87 0222              761         B     HALT                  ERROR * FC **************************
  1237 89FC               1238 762         DC    XL2'89FC'
  1239 B1 AE 11                763 Z12     LIO   NRMDFC(,XR2),CTLREG   LOAD CONTROL REG.
  123C F2 87 03                764         J     SAVPRM
  123F BC 01 16                765 SETALT  MVI   ARDDFC(,XR2),0.          SET FLAG BIT TO ALTERNATE
  1242 AC 01 09 9F             766 SAVPRM  MVC   EXTSAV(2,XR2),SETXR1(,XR2)  SAVE OLD PARAMETER PTR.
  1246 E0 87 25                767         B     STPARM(,XR2)          TO I/O SUBROUTINE TO SEEK ALT. TK.
                          1249 768 Z13     DC    XL1'08'               FUNCTION CODE
  124A B5 02 28           1159 769         USING BASE1,2
                               770         L     NRMDFC(,XR2),XR2      LOAD BASE VALUE FOR START I/O
                          1173 771         USING RDDFC,2
  124D AC 01 9F 09             772         MVC   SETXR1(2,XR2),EXTSAV(,XR2)   RESTORE PAREMETER PTR.
  1251 AC 02 19 03             773         MVC   ARDDFC+3(3,XR2),RDDFC+3(,XR2) TRANSFER SECTOR NO.
                               774 *                                     CYL. NO. AND NO. OF SECTORS
  1255 E0 87 26                775         B     LDPARM(,XR2)          TO RETRY ORIGINAL OPERATION
                               776
                               776
                               777 ********************************************************************************
                               778 **      PRINT NOT READY MESSAGE                                               **
                               779 ********************************************************************************
                               780
                               780
  1258 C0 87 021A              781 NOTRDY  B     PRINT
  125C C7                 125C 782         DC    XL1'C7'
  125D 32                 125D 783         DC    IL1'50'
  125E 129C               125F 784         DC    AL2(DSKND)
  1260 89FE               1261 785         DC    XL2'89FE'
  1262 C0 87 0222              786         B     HALT                  ERROR * FE **************************
  1266 89FE               1267 787         DC    XL2'89FE'
  1268 E0 87 2B                788         B     LDPARM+3(,XR2)
  1268 C4C9E2D240D5D6E3 129C   789 DSKND   DC    CL50'DISK NOT READY. MAKE F1 / R1 READY AND RESET HALT'
  1273 40D9C5C1C4E86840        789
  1278 C4C1D2C540C6F140        789
  1283 6140D9F140D9C5C1        789
  1288 C4E840C1D5C44CD9        789
  1293 C5E2C5E340C8C1D3        789
  1298 E349                    789
  129D C4C9E2D240C5D9D9 12BC   790 DSKER   DC    CL32'DISK ERROR. RESET HALT TO RETRY'
  12A5 D6D96B40D9C5E2C5        790
  12AD E340C8C1D3E340E3        790
  12B5 D640D9C5E3D9E840        790
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               792 ********************************************************************** *GC*
                               793 *****  TITLE ' DISK TYPE 3340 I/O ROUTINE              ************** *GC*
                               794 ********************************************************************** *GC*
                               795
                               795
                               795
                               795
                               795
  12BD 3D 33 0A95              796 DISK33 CLI DSKTYP,X'33'       SOURCE A 3340
  12C1 C0 01 11A6              797        BNE  DISK54            IF NOT BRANCH TO 5444 ROUTINES          *GC*
  12C5 0C 09 15E0 1602         798        MVC DDCFE(10),DDCFB    INITIAL DDCF FIELD                      *GC*
  12CB 30 CD 10D8              799        SNS STATUS,X'CD'       RESET HISTORY UNIT CHECK BITS           *GC*
  12CF C1 C8 1489              800        TIO DKNR,X'C8'         NOT READY/UNIT CHECK ERROR TEST         *GC*
  12D3 3C 00 15D7              801        MVI DDCF,X'00'         CLEAR FLAG BYTE                         *GC*
                               802
                               802
                               803 ********************************************************************************
                               804 ********    SUB-ROUTINE TO  CONVERT                  ********************
                               805 ********      5444 ADDRESS INTO 3340 ADDRESS         ********************
                               806 ********************************************************************************
                               807 *                                                                            *
                               808 *      INPUT:  DSKDRV --> IOB08                                              *
                               809 *              DSKCYL --> IOBCHN-2                                           *
                               810 *              DSKSEC --> IOBCHN-1                                           *
                               811 *                                                                            *
                               812 *      OUTPUT: DDCF FIELD CYLINDER,HEAD,RECORD NUMBER FOR 3340 SYSTEM        *
                               813 *                                                                            *
                               814 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                               815 *  THE FOLLOWING AREA IS SET ASIDE FOR USE AS CONSTANTS IN THE 5444          *
                               816 *  CONVERSION ROUTINE.                                                       *
                               817 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                               818
  12D7 C0 87 1332              819        B     GPCS                                                    *GC*
  12DB 20                 12DB 820 HEX20  DC    XL1'20'                                                 *
  12DC 04                 12DC 821 FOUR   DC    XL1'04'                                                 *
  12DD 14                 12DD 822 FORTEN DC    XL1'14'                                                 *
  12DE 17                 12DE 823 SVNTEN DC    XL1'17'
                          12DF 824 TABLES EQU   *
  12DF C0A9               12E0 825         DC    XL2'C0A9'          TABLE ENTRY FOR A F1 REQUEST
  12E1 C0B3               12E2 826         DC    XL2'C0B3'          TABLE ENTRY FOR A R1 REQUEST
  12E3 C8A9               12E4 827         DC    XL2'C8A9'          TABLE ENTRY FOR A F2 REQUEST
  12E5 C8B3               12E6 828         DC    XL2'C8B3'          TABLE ENTRY FOR A R2 REQUEST
  12E7 00                 12E7 829 HEADWA  DC    XL1'00'            WORK AREA
                          12E8 830 STARTN  EQU   *
  12E8 00000000           12EB 831 IOBCHN  DC    XL4'00'      BUFFER AREA FOR SUB-ROUTINE
  12EC 00                 12EC 832 IOB08   DC    XL1'00'      BUFFER WORK AREA
                               833
                               834 ********************************************************************************
                               835
  12ED C0 87 021A              836 ERRMSG  B     PRINT          PRINT THAT ROUTINE UNABLE TO CONVERT    *GC*
  12F1 87                 12F1 837         DC    XL1'87'          THE 5444 ADDRESS INTO A 3340 ADDRESS  *GC*
  12F2 33                 12F2 838         DC    IL1'51'          LENGTH OF MESSAGE                     *GC*
  12F3 1331               12F4 839         DC    AL2(ERRMSL)                                            *GC*
  12F5 C0 87 0222              840         B     HALT                                                   *GC*
  12F9 89FA               12FA 841         DC    XL2'89FA'                                              *GC*
  12FB C0 87 0216              842         B     LINK                                                   *GC*
  12FF E4D5C1C2D3C540E3 1331   843 ERRMSL  DC    CL51'UNABLE TO CONVERT 5444 ADDRESS INTO A 3340 ADDRESS.'
  1307 D640C3D6D5E5C5D9        843
  130F E340F5F4F4F440C1        843
  1317 C4C4D9C5E2E240C9        843
  131F D5E3D640C140F3F3        843
  1327 F4F040C1C4C4D9C5        843
  132F E2E248                  843
                               844
                               844
                               844
                               844
                               844
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FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1332  845 GPCE   EQU   *
                         12E8  846        USING STARTN,XR1
    1332 C2 01 12E8            847        LA    STARTN,XR1
    1336 0C 01 12EA 1175       848        MVC   IOBCHN-1(2),DSKSEC
    133C 4C 00 04 1204         849        MVC    IOBQB(1,XR1),SIO+1        SAVE THE 5444 Q CODE
    1341 5C 00 03 04           850        MVC   IOBCHN(1,XR1),IOBQB(,XR1)  SAVE THE 5444 Q CODE
                         12DF  851        USING TABLES,XR2
    1345 C2 02 12DF            852        LA    TABLES,XR2          LOAD REG 2 WITH ADDRESS OF TABLE
    1349 78 10 03              853        TBN   IOBCHN(,XR1),X'10'  Q CODE FOR SPINDLE 1?
    134C F2 90 03              854        JF    CKFIXD              JUMP IF REG 2 IS OK
    134F E2 02 04              855        LA    4(,XR2),XR2         BUMP TO POINT TO SECOND HALF
    1352 78 08 03              856 CKFIXD TBN   IOBCHN(,XR1),X'08'  Q CODE FOR FIXED DRIVE?
    1355 F2 10 03              857        JT    NEWDRV              JUMP IF FOR F1 OR F2
    1358 E2 C2 02              858        LA    2(,XR2),XR2         BUMP IF FOR REMOVABLE
                               859
                               859
                               859
                               860 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                               861 *    REGISTER 2 NOW POINTS TO THE TABLE ENTRY COORESPONDING TO THE    *
                               862 *    REQUESTED 5444 DRIVE.                                            *
                               863 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                               864
    135B 2C 00 1371 01         865 NEWDRV MVC   CYSTRT(1),1(,XR2)   SET MOVE INSTRUCTION TO PICKUP START
                               866 *                                CYLINCER OF SIMULATED AREA
    1360 68 00 04 00           867        MZZ   IOBQB(,XR1),0(,XR2) MOVE IN THE ZONE OF OPERATION CODE
    1364 88 08 00              868        TBN   0(,XR2),X'08'       FOR 3340 DRIVE 2 OR 4?
    1367 7A 08 04              869        SBN   IOBQB(,XR1),X'08'   ASSUME 3340 DRIVE 2 OR 4
    136A F2 10 03              870        JT    CVTCTH              GO START THE CONVERSION
    136D 7B 08 04              871        SBF   IOBQB(,XR1),X'08'   CORRECT A BAD ASSUMPTION
    1370 7C 00 00              872 CVTCTH MVI   IOBCHN-3(,XR1),0    MOVE IN START OF SIMULATION AREA
                         1371  873 CYSTRT EQU   *-2
    1373 7D 04 01              874        CLI   IOBCHN-2(,XR1),X'04' CHECK FOR 5444 CYL 0,1,2, OR 3
    1376 F2 82 26              875        JL    CKCYL0              IF LOW GO CHECK FOR CYL 0
    1379 7D CB 01              876        CLI   IOBCHN-2(,XR1),X'CB' CHECK FOR CYLINDER 203?
    137C C0 02 12ED            877        BNL   ERRMSG              CYLINDER 203 OR GREATER IS INVALID
    1380 4F 00 01 12DE         878        SLC   IOBCHN-2(1,XR1),SVNTEN SUBTRACT NUMBER OF 44 TRACKS
                               879 *                                POSSIBLE ON FIRST 3349 CYLINDER
    1385 F2 82 29              880        JN    ADDBAK              JUMP IF 44 CYLINDER IS ON FIRST
                               881 *                                SIMULATED 3340 CYLINDER
    1388 7D 00 01              882 CKZERO CLI   IOBCHN-2(,XR1),X'00' SEE IF CYLINDER WENT ZERO
    138B F2 81 18              883        JE    UPCYLN              IF ZERO CONVERSION OF CYL IS
                               884 *                                ALMOST DONE.
    138E 4E C0 00 1170         885        ALC   IOBCHN-3(1,XR1),ONE ADD ONE TO 3340 CYLINDER
    1393 4F 00 01 12DD         886        SLC   IOBCHN-2(1,XR1),FORTEN  SUBTRACT NUMBER OF 44 CYLINDERS
                               887 *                                POSSIBLE ON NEXT 3340 CYLINDER
    1398 F2 82 16              888        JN    ADDBAK              JUMP IF RESULT WENT NEGATIVE
    139B C0 87 1388            889        B     CKZERO              LOOP BACK AND CHECK AGAIN
                               890
    139F 7D 00 01              891 CKCYL0 CLI   IOBCHN-2(,XR1),X'00' IS THE REQUEST FOR CYLINDER ZERO?
    13A2 C0 01 12ED            892        BNE   ERRMSG              IF NOT FOR ZERO, ERROR
    13A6 F2 87 0D              893        J     CVTSTR              GO TO CONVERT SECTOR TO RECORD
                               894
    13A9 4E C0 00 1170         895 UPCYLN ALC   IOBCHN-3(1,XR1),ONE UPDATE TO NEXT 3340 CYLINDER
    13AE F2 87 05              896        J     CVTSTR              GO CONVERT SECTOR TO RECORD
                               897
    *381 4E 00 01 12DD         898 ADDBAK ALC   IOBCHN-2(1,XR1),FORTEN ADD BACK FOURTEEN WHEN RESULT
                               899 *                                GOES MINUS.
                               900
    13B6 3C 01 12E7            901 CVTSTR MVI   HEADWA,X'01'        INITIALIZE WORK AREA WITH A 1
    13BA 7D 00 02              902        CLI   IOBCHN-1(,XR1),X'00' REQUEST FOR A 5444 SECTOR ZERO?
    13BD F2 81 21              903        JE    EXIT                CONVERSION IS DONE
    13C0 78 80 02              904        TBN   IOBCHN-1(,XR1),X'80' TRACK 2 OF 5444 REQUESTED?
    13C3 F2 90 05              905        JF    BUMP                JUMP IF TRACK 1 WAS REQUESTED
    13C6 4F 00 02 12DB         906        SLC   IOBCHN-1(1,XR1),HEX20 MAKE TRACK 2 AND 1 CONTIGIOUS
                               907
    13CB 7D FC 02              908 BUMP   CLI   IOBCHN-1(,XR1),X'FC'  DID SECTOR NUMBER GO MINUS?
    13CE C0 84 12ED            909        BM    ERRMSG                ERROR IF SECTOR IS MINUS
    13D2 0E 00 12E7 1170       910        ALC   HEADWA(1),ONE         ADD ONE TO RECORD NUMBER
```


FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    13D8 4F 00 02 12DC         911        SLC   IOBCHN-1(1,XR1),FOUR  DECREMENT SECTOR COUNT
    13DD C0 01 13CB            912        BNZ   BUMP                         LOOP BACK IF NOT ZERO
                               913
    13E1 4C 00 02 12E7         914 EXIT   MVC   IOBCHN-1(1,XR1),HEADWA MOVE RECORD COUNT TO IOB
    13E6 0C 00 15D9 12E8       915        MVC   DDCF+2(1),IOBCHN-3     MOVE CYCLINDER NUMBER
    13EC 0C 00 15DB 12E9       916        MVC   DDCF+4(1),IOBCHN-2     MOVE HEAD NUMBER
    13F2 0C 00 15DC 12EA       917        MVC   DDCF+5(1),IOBCHN-1     MOVE RECORD NUMBER
                               918 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                               919 *  END OF 5444 TO 3340 SIMULATION CONVERSION ROUTINE               *
                               920 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   13F8 0C 00 15F8 1204        922         MVC DSKFCT(1),SIO+1 LOAD DISK FUNCT (READ 01-WRITE 02-SEEK 00)
   13FE 38 F8 15F8             923         SBF DSKFCT,X'F8'    STRIP OFF OP,DA,N BITS
   1402 0C 00 1458 15F8        924         MVC RDWRT+1(1),DSKFCT MOVE DISK FUNCTION READ/WRITE INTO SIO*GC*
   1408 0E 00 1458 15F7        925         ALC RDWRT+1(1),DRV32  INSERT DRIVE NUMBER INTO SIO          *GC*
   140E C1 CA 140E             926         TIO *,X'CA'       ATTACHMENT BUSY (WAIT)                    *GC*
   1412 31 CE 15CE             927         LIO LDCF,X'CE'    LOAD DDCR WITH ADDRESS OF DDCF            *GC*
   1416 31 CC 15D0             928         LIO LDDF,X'CC'    LOAD DDDR WITH ADDRESS OF DDDF            *GC*
   141A F3 C8 C0               929         SIO 0,X'C8'       SEEK COMMAND   PRIMARY TRACK              *GC*
   141D C1 C9 141D             930         TIO *,X'C9'       SEEK BUSY  (WAIT)                         *GC*
   1421 C1 CA 1421             931         TIO *,X'CA'       ATTACHMENT BUSY (WAIT)                    *GC*
   1425 C1 C8 149E             932         TIO DKER9,X'C8'   NOT READY / UNIT CHECK AFTER SEEK CMD     *GC*
   1429 0C 09 15F4 15E0        933         MVC  DDCZ(10),DDCFE                                         *GC*
   142F 0C 01 15F3 15F6        934         MVC  DDCZ-1(2),DDZL                                         *GC*
   1435 31 CE 15D2             935         LIO LDCX,X'CE'    LOAD DDCR WITH ADDRESS OF DDCX (DDCF)     *GC*
   1439 31 CC 15D0             936         LIO LDDF,X'CC'    LOAD DDDR WITH ADDRESS OF DDDF            *GC*
   143D F3 C9 01               937 SIO33   SIO X'01',X'C9'   RD HA & R0 EVEN COMMAND                   *GC*
   1440 C1 CA 1440             938         TIO *,X'CA'       ATTACHMENT BUSY  (WAIT)                   *GC*
   1444 C1 C8 148C             939         TIO DKER2,X'C8'   NOT READY/UNIT CHECK ???                  *GC*
                               940
   1448 38 02 15E1             941         TBN DDDF,X'02'    CHECK FOR DEFECTIVE PRIMARY TRACK         *GC*
   144C F2 10 17               942         JT  PRIDEF        JUMP TO ALTERNATE TRACK                   *GC*
                               943
                        144F   944 LIO33   EQU *                                                       *GC*
   144F 31 CE 15CE             945         LIO LDCF,X'CE'    LOAD DDCR WITH ADDRESS OF DDCF            *GC*
   1453 31 CC 15D4             946         LIO LBUF,X'CC'    LOAD DDDR WITH ADDRESS OF DBUF            *GC*
   1457 F3 C9 00               947 RDWRT   SIO 0,X'C9'       RD/WRT KEY DATA (C9/CA)                   *GC*
   145A C1 CA 145A             948         TIO *,X'CA'       ATTACHMENT BUSY (WAIT)                    *GC*
   145E C1 C8 1495             949         TIC DKER4,X'C8'   NOT READY/UNIT CHECK                      *GC*
   1462 C0 87 120F             950         B   SETXR1-3      RETURN TO CALLER                          *GC*
                               951
                        1466   952 PRIDEF EQU *                                                       *GC*
   1466 3C 01 15E1             953         MVI DDDF,X'01'    SET-UP FLAG BYTE FOR ALTERNATE            *GC*
   146A 3C 01 15D7             954         MVI DDCF,X'01'    SET-UP FLAG BYTE FOR ALTERNATE            *GC*
   146E C1 CA 146E             955         TIO *,X'CA'       ATTACHMENT BUSY (WAIT)                    *GC*
   1472 31 CE 15D0             956         LIO LDDF,X'CE'    LOAD DDCR WITH ADDRESS OF DDDF            *GC*
   1476 F3 C8 00               957         SIO 0,X'C8'       SEEK COMMAND ON ALTERNATE                 *GC*
   1479 C1 C9 1479             958         TIO *,X'C9'       SEEK BUSY ???  (WAIT)                     *GC*
   147D C1 CA 147D             959         TIO *,X'CA'       ATTACHMENT BUSY (WAIT)                    *GC*
   1481 C1 C8 149E             960         TIO DKER9,X'C8'   NOT READY / UNIT CHECK AFTER SEEK CMD     *GC*
   1485 C0 87 143D             961         B   SIO33         GO TO RD HA & R0 ALTERNATE                *GC*
                               962
   1489 F2 87 21               963 DKNR    J   PRTNR                 * PRINT NOT READY / UNIT CHECK    *GC*
                               964
   148C 0C 13 157C 1590        965 DKER2   MVC PD31(20),PD35         * MOVE AFTER READ HA & R0         *GC*
   1492 F2 87 18               966         J   PRTNR                 * NOT READY / UNIT CHECK          *GC*
                               967
   1495 0C 13 157C 15A4        968 DKER4   MVC PD31(20),PD43         * MOVE AFTER READ RD/WRT CMD      *GC*
   1498 F2 87 0F               969         J   PRTNR                 * NOT READY / UNIT CHECK          *GC*
                               970
   149E 0C 13 157C 15B8        971 DKER9   MVC PD31(20),PD46         * MOVE AFTER SEEK COMMAND         *GC*
   14A4 F2 87 06               972         J   PRTNR                 * NOT READY / UNIT CHECK          *GC*
                               973
   14A7 0C 13 157C 15CC        974 DKERA   MVC PD31(20),PD48         * MOVE AFTER READ DIAG CMD        *GC*
                               975
   14AD C0 87 021A             976 PRTNR   B   PRINT                 * PRINT THAT UNIT                 *GC*
   14B1 C2                14B1 977         DC  XL1'C2'               * NOT READY / UNIT CHECK OCCURRED *GC*
   14B2 3A                14B2 978         DC  AL1(PD31-PD30)        *          DRIVE                  *GC*
   14B3 157C              14B4 979         DC  AL2(PD31)             *            IS                   *GC*
   14B5 89FB              14B6 980         DC  XL2'89FB'
   14B7 3C 40 157C             981         MVI PD31,X'40'            * PLACE = =                       *GC*
   14BB 0C 12 157B 157C        982         MVC PD31-1(19),PD31       * BLANK PD31 WORK AREA            *GC*
   14C1 30 CD 10D8             983         SNS STATUS,X'CD' SENSE STATUS BYTES 0,1                     *GC*
   14C5 C0 87 021E             984         B   UNPACK                * UNPACK                          *GC*
   14C9 02                14C9 985         DC  XL1'02'               *       STATUS                    *GC*
   14CA 10D8              14CB 986         DC  AL2(STATUS)           *            BYTES                *GC*
   14CC 1525              14CD 987         DC  AL2(STATOT)           *                 0,1             *GC*
   14CE C0 87 021A             988         B   PRINT                 * PRINT                           *GC*
   14D2 82                14D2 989         DC  XL1'82'               *       STATUS                    *GC*
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FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   14D3 1A                14D3  990         DC  AL1(STATOT-STATST) *          BYTES                  *GC*
   14D4 1525              14D5  991         DC  AL2(STATOT)           *               0,1               *GC*
   14D6 C1 CA 14D6              992         TIO *,X'CA'       ATTACHMENT BUSY (WAIT)                    *GC*
   14DA 31 CC 15D6              993         LIO LSNS,X'CC'    LOAD DDDR WITH ADDRESS OF DSNS            *GC*
   14DE F3 C9 07                994         SIO 7,X'C9'       RD DIAG BYTES                             *GC*
   14E1 C1 CA 14E1              995         TIO *,X'CA'       ATTACHMENT BUSY (WAIT)                    *GC*
   14E5 C1 C8 14A7              996         TIO DKERA,X'C8'   NOT READY / UNIT CHECK AFTER READ DIAG CMD *GC*
   14E9 C0 87 021E              997         B   UNPACK               * UNPACK                          *GC*
   14ED 18                14ED  998         DC  IL1'24'               *       READ DIAG                 *GC*
   14EE 161A              14EF  999         DC  AL2(DSNSE)            *            BYTES                *GC*
   14F0 164A              14F1 1000         DC  AL2(PSNS)             *                 0-23            *GC*
   14F2 C0 87 021A              1001         B   PRINT                * PRINT HEADING FOR               *GC*
   14F6 83                14F6 1002         DC  XL1'83'               *       READ DIAG                 *GC*
   14F7 1D                14F7 1003         DC  AL1(RDDGE-RDDGS)      *            BYTES                *GC*
   14F8 1542              14F9 1004         DC  AL2(RDDGE)            *                 0-23            *GC*
   14FA C0 87 021A              1005         B   PRINT                * PRINT                           *GC*
   14FE 86                14FE 1006         DC  XL1'86'               *       READ DIAG                 *GC*
   14FF 30                14FF 1007         DC  IL1'48'               *            BYTES                *GC*
   1500 164A              1501 1008         DC  AL2(PSNS)             *                 0-23            *GC*
   1502 C0 87 0222              1009         B   HALT                                                    *GC*
   1506 89FB              1507 1010         DC  XL2'89FB'                                               *GC*
   1508 C0 87 0216              1011         B   LINK                                                    *GC*
                                1012
                        150B    1013 STATST EQU *-1                                                     *GC*
   150C 40E2E3C1E3E4E240 1525   1014 STATOT DC  CL26' STATUS BYTES 0,1 ARE XXXX'                        *GC*
   1514 C2E8E3C5E240F06B        1014
   151C F140C1D9C540E7E7        1014
   1524 E7E7                    1014
                                1015 RDDGS  EQU *-1                                                     *GC*
   1526 40D9C5C1C440C4C9 1542   1016 RDDGE  DC  CL29' READ DIAG STATUS BYTES ARE '                      *GC*
   152E C1C740E2E3C1E3E4        1016
   1536 E240C2E8E3C5E240        1016
   153E C1D9C54040              1016
                                1017 PD30   EQU *-1                                                     *GC*
   1543 40C4C9E2D240C4D9 1550   1018         DC  CL14' DISK DRIVE  2'                                   *GC*
   154B C9E5C54040F2            1018
   1551 40D5D6E340D9C5C1 1568   1019         DC  CL24' NOT READY / UNIT CHECK '                         *GC*
   1559 C4E8406140E4D5C9        1019
   1561 E340C3C8C5C3D240        1019
   1569 404040404040404040 157C 1020 PD31   DC  CL20'                    '                            *GC*
   1571 4040404040404040        1020
   1579 40404040                1020
   157D 40C1C6E3C5D94CD9 1590   1021 PD35   DC  CL20' AFTER READ HA & R0,'                             *GC*
   1585 C5C1C440C8C14050        1021
   158D 40D9F04B                1021
   1591 40C1C6E3C5D940D9 15A4   1022 PD43   DC  CL20' AFTER RD/WRT DATA .'                             *GC*
   1599 C461E6D9E340C4C1        1022
   15A1 E3C1404B                1022
   15A5 40C1C6E3C5D940E2 15B8   1023 PD46   DC  CL20' AFTER SEEK COMMAND.'                             *GC*
   15AD C5C5D240C3D6D4D4        1023
   15B5 C1D5C44B                1023
   15B9 40C1C6E3C5D940D9 15CC   1024 PD48   DC  CL20' AFTER READ DIAG CMD'                             *GC*
   15C1 C5C1C440C4C9C1C7        1024
   15C9 40C3D4C4                1024
                                1025
                                1025
   15CD 15D7              15CE  1026 LDCF   DC      AL2(DDCF)      ADDRESS LEFT-MOST BYTE OF DDCF      *GC*
   15CF 15E1              15D0  1027 LDDF   DC      AL2(DDDF)      ADDRESS LEFT-MOST BYTE OF DDDF      *GC*
   15D1 15E8              15D2  1028 LDCX   DC      AL2(DDCX)      ADDRESS LEFT-MOST BYTE OF DDCX (DDCF) *GC*
   15D3 164B              15D4  1029 LBUF   DC      AL2(DBUF)      ADDRESS LEFT-MOST BYTE OF DBUF      *GC*
   15D5 1603              15D6  1030 LSNS   DC      AL2(DSNS)      ADDRESS LEFT-MOST BYTE OF DSNS      *GC*
                                1031 ********************READ/WRITE KEY-DATA*********************************GC*
                                1032 *  DDCF       * F * CC * HH * R * KL * DL * N *   DISK DRIVE      *GC*
                                1033 ********************************************** CONTROL FIELD      *GC*
                        15D7    1034 DDCF   EQU *
   15D7 00                15D7  1035         DC    XL1'0'      FLAG              R    W                  *GC*
   15D8 0000              15D9  1036         DC    XL2'00'     CYLINDER           E    R                 *GC*
   15DA 0000              15DB  1037         DC    XL2'00'     HEAD ADDRESS        A    I                *GC*
```

FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   15DC 00               15DC 1038         DC    XL1'0'      RECORD              D    T                *GC*
   15DD 00               15DD 1039         DC    XL1'0'      KEY LENGTH               E                *GC*
   15DE 0000             15DF 1040         DC    XL2'00'     DATA LENGTH        CONTROL                *GC*
   15E0 00               15E0 1041         DC    XL1'0'      COUNT                    FIELD            *GC*
                         15E0 1042 DDCFE   EQU   *-1                                                   *GC*
                               1043 ********************** READ HA & R0 ********************************GC*
                         15E1 1044 DDDF    EQU *                                                       *GC*
   15E1 0000000000000000 15EA 1045         DC  XL10'0'       * DISK DRIVE DATA FIELD FOR READ HA & R0  *GC*
   15E9 0000             1045
                               1046 ******************                          **********************GC*
                         15EB 1047 DDCX    EQU   *           * DISK DRIVE
   15EB 00               15EB 1048         DC    XL1'0'      FLAG              C                      *GC*
   15EC 0000             15ED 1049         DC    XL2'00'     CYLINDER         O                       *GC*
   15EE 0000             15EF 1050         DC    XL2'00'     HEAD ADDRESS      N     F                *GC*
   15F0 00               15F0 1051         DC    XL1'0'      RECORD             T     I               *GC*
   15F1 00               15F1 1052         DC    XL1'0'      KEY LENGTH          R     E              *GC*
   15F2 00C0             15F3 1053         DC    XL2'00'     DATA LENGTH          O    L              *GC*
   15F4 00               15F4 1054         DC    XL1'0'      COUNT                 L    D             *GC*
                         15F4 1055 DDCZ    EQU   *-1         *                       FOR READ HA & R0  *GC*
   15F5 0008             15F6 1056 DDZL    DC    XL2'0008'   **DATA LENGTH** FOR READ HA & R0          *GC*
                               1057 ************************************************************************GC*
   15F7 C8               15F7 1058 DRV32   DC  XL1'C8'       * DISK DRIVE ADDRESS BITS DRIVE 2        *GC*
   15F8 01               15F8 1059 DSKFCT  DC  XL1'01'       DISK FUNCTION (READ 01 / WRITE 02 / SEEK 00)
   15F9 0000000000000001 1602 1060 DDCFB   DC  XL10'00000000000000010000'  * INITIAL VALUE FOR DDCF    *GC*
   1601 0000             1060
                               1061 ************************************************************************GC*
                               1062
                         1603 1063 DSNS    EQU   *                                                     *GC*
   1603                  161A 1064 DSNSE   DS    XL24                                                  *GC*
   161B                  164A 1065 PSNS    DS    XL48                                                  *GC*
                               1066 ************** END OF DISK I/O FOR 3340 ****************************GC*
```


FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         1648 1068 DBUF    EQU   *
   1648                  174A 1069         DS    XL256
   1748 0008             174C 1070 C50008  DC    XL2'0008'
   174D 404040404040     1752 1071 MLTAF   DC    CL6' '
   1753 00               1753 1072 CNT     DC    XL1'0'
   1754 404040404040     1759 1073 BLANK   DC    CL6' '
                         175A 1074 XMSG1   EQU   *
   175A E6C9D3D340E2E8E2 1773 1075         DC    CL26'WILL SYSTEM PACK RUN FROM '
   1762 E3C5D440D7C1C3D2       1075
   176A 40C9E4D540C6D9D6       1075
   1772 D440                   1075
   1774 D9F1             1775 1076 R1      DC    CL02'R1'
   1776 40D60940         1779 1077         DC    CL04' OR '
   177A C6F1             177B 1078 F1      DC    CL02'F1'
   177C 6F               177C 1079         DC    CL01'?'
   177D 00               177D 1080         DC    XL1'0'
                         177E 1081 XMSG2   EQU   *
   177E C7C9E5C540E3C8C5 17B1 1082         DC    CL52'GIVE THE NAME OF YOUR 3277  MICRO-CODE  OBJECT FILE '
   1786 40D5C1D4C540D6C6       1082
   178E 40E8D6E4D940F3F2       1082
   1796 F7F74040D4C9C3D9       1082
   179E D660C3D6C4C54040       1082
   17A6 D6C2D1C5C3E340C6       1082
   17AE C9D3C540               1082
   17B2 00               17B2 1083         DC    XL1'0'
                         17B3 1084 XMSG3   EQU   *
   17B3 C9E340E6C9D3D340 17E0 1085         DC    CL46'IT WILL DEFAULT TO  SSMCRI IF NO NAME IS GIVEN'
   17BB C4C5C6C1E4D3E340       1085
   17C3 E3D64040C5B5BD4C3      1085
   17C8 D9C940C9C640D5D6       1085
   17D3 40D5C1D4C54CC9E2       1085
   17DB 40C7C9E5C5D5           1085
   17E1 00               17E1 1086         DC    XL1'0'
                         17E2 1087 XMSG4   EQU   *
   17E2 D7D3C1C3C540E2E8 1815 1088         DC    CL52'PLACE SYSTEM PACK ON R1/D2, POWER UP DISK AND PRESS '
   17EA E2E3C5D440D7C1C3       1088
   17F2 D240D6D540D9F161       1088
   17FA C4F26B40D7D6E6C5       1088
   1802 D940E4D740C4C9E2       1088
   180A D240C1D5C440D7D9       1088
   1812 C5E2E240               1088
   1816 C5D5E3C5D940D6D5 1827 1089 OVLMSG DC    CL18'ENTER ON THE 3277.'
   181E 40E3C8C540F3F2F7       1089
   1826 F748                   1089
   1828 00               1828 1090         DC    XL1'0'
                         1829 1091 GBTBL   EQU   *
   1829 1136             182A 1092         DC    AL2(Z1-1)
   182B 115B             182C 1093         DC    AL2(Z2-1)
   182D 1162             182E 1094         DC    AL2(Z3-1)
   182F 1188             1830 1095         DC    AL2(Z4)
   1831 1188             1832 1096         DC    AL2(Z5)
   1833 11C7             1834 1097         DC    AL2(Z6)
   1835 11CA             1836 1098         DC    AL2(Z7)
   1837 11D3             1838 1099         DC    AL2(Z8)
   1839 1200             183A 1100         DC    AL2(Z9)
   1838 121A             183C 1101         DC    AL2(Z10)
   183D 121D             183E 1102         DC    AL2(Z11)
   183F 1239             1840 1103         DC    AL2(Z12)
   1841 1248             1842 1104         DC    AL2(Z13-1)
   1843 11A6             1844 1105         DC    AL2(Z14)
   1845 113D             1846 1106         DC    AL2(Z15-1)
   1847 1203             1848 1107         DC    AL2(S10)
   1849 FFFF             184A 1108         DC    AL2(*-*-1)
                         2001 1109 TABLE   EQU   X'2001'           LINK TO MICRO CODE MAP IN 893
                         2004 1110 XKFCX   EQU   X'2004'           LINK TO MICRO DECK ID IN 893
   184B F0F9             184C 1111 S9      DC    CL2'09'
   184D F1F7             184E 1112 S17     DC    CL2'17'
   184F 00               184F 1113 LOADFL  DC    XL1'00'           MICRO-CODE LOADED FLAG
```

FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1850 C9C640E2E8E2E3C5 1868 1114 M8MG2  DC    CL28'IF SYSTEM PACK WILL BE ON R1'
   1858 D440D7C1C3D240E6       1114
   1860 C9D3C340C2C540D6       1114
   1868 D540D9F1               1114
   186C 6B40E2C5E340D9C9 188B 1115 M8MG3  DC    CL32'. SET RIGHTMOST DATA SWITCH TO 1'
   1874 C7C8E3D4D6E2E340       1115
   187C C4C1E3C140E2E6C9       1115
   1884 E3C3C840E3D640F1       1115
   188C D9C5E2C5E340C8C1 18A1 1116 M8MG4  DC    CL22'RESET HALT TO CONTINUE'
   1894 D3E340E3D640C3D6       1116
   189C D5E3C9D5E4C5           1116
   18A2 C9C640E2E8E2E3C5 18D5 1117        DC    CL52'IF SYSTEM PACK MICRO-CODE OBJECT FILE NAME IS 8SMCRI'
   18AA D440D7C1C3D240D4       1117
   18B2 C9C3D9D660C3D6C4       1117
   18BA C540D6C2D1C5C3E3       1117
   18C2 40C6C9D3C540D5C1       1117
   18CA D4C540C9E2405B5B       1117
   18D2 C4C3D9C9               1117
   18D6 6B40E2C5E340C4C1 18E9 1118 M8MG5  DC    CL20'. SET DATA SW 4 = 1.'
   18DE E3C140E2E640F440       1118
   18E6 7E40F14B               1118
   18EA D6E3C8C5D9E6C9E2 1906 1119 M8MG5B DC    CL29'OTHERWISE. SET DATA SW 4 = 0.'
   18F2 C56B40E2C5E340C4       1119
   18FA C1E3C140E2E640F4       1119
   1902 407E40F04B             1119
   1907 C5D5E3C5D940C6C9 1937 1120        DC    CL49'ENTER FILE NAME 1 CHAR. AT A TIME IN EBCDIC CODE '
   190F D3C540D5C1D4C540       1120
   1917 F140C3C8C1D94B40       1120
   191F C1E340C140E3C9D4       1120
   1927 C54CC9D540C5C2C3       1120
   192F C4C9C340C3D6C4C5       1120
   1937 40                     1120
   1938 E4E2C9D5C740C4C1 1949 1121 M8MG6  DC    CL18'USING DATA SW 3.4.'
   1940 E3C140E2E64CF36B       1121
   1948 F44B                   1121
   194A D9C5E2C5E340C8C1 1974 1122 M8MG7  DC    CL43'RESET HALTS F1-F6 AS EACH CHAR. IS ENTERED.'
   1952 D3E3E240C6F16CC6       1122
   195A F640C1E240C5C1C3       1122
   1962 C840C3C8C1D94B40       1122
   196A C9E240C5D5E3C5D9       1122
   1972 C5C44B                 1122
   1975 D4C1E74B40D5C1D4 19A5 1123 M8MG7A DC    CL49'MAX. NAME IS 6 CHAR.  BLANK WILL TERMINATE ENTRY.'
   197D C540C9E240F640C3       1123
   1985 C8C1D94B4040C2D3       1123
   198D C1D5D240E6C9D3D3       1123
   1995 40E3C5D9D4C9D5C1       1123
   199D E3C540C5D5E3D9E8       1123
   19A5 4B                     1123
   19A6 C6C9D3C540D5C1D4 19C3 1124 M8MG8A DC    CL30'FILE NAME TO BE USED IS XXXXXX'
   19AE C540E3D640C2C540       1124
   1986 E4E2C5C440C9E240       1124
   196E E7E7E7E7E7E7           1124
   19C4 4B4040D9C5E2E3C1 19DA 1125 M8MG8  DC    CL23'.  RESTART IF INCORRECT'
   19CC D9E340C9C640C9D5       1125
   19D4 C3D6D9D9C5C3E3         1125
                        0001 1126 XR1      EQU   1
                        0002 1127 XR2      EQU   2
                        0008 1128 ARR      EQU   8
                        00C0 1129 IAR1     EQU   X'C0'
                        0080 1130 SSW20    EQU   X'80'
                        0010 1131 SSW23    EQU   X'10'
                        0008 1132 SSW24    EQU   X'08'
                        0002 1133 SSW2E    EQU   X'02'
                        0008 1134 SSW2C    EQU   X'08'
                        0004 1135 SSW2D    EQU   X'04'
                        0200 1136 MODEL    EQU   X'200'
                        020C 1137 SBYTE4   EQU   X'20C'
                        020D 1138 SBYTE5   EQU   X'20D'
```


FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         0216 1139 LINK     EQU   X'216'
                         021A 1140 PRINT    EQU   X'21A'
                         021E 1141 UNPACK   EQU   X'21E'
                         0222 1142 HALT     EQU   X'222'
                         022A 1143 LOAD     EQU   X'22A'
                         0232 1144 UDT      EQU   X'232'
                         2020 1145 DUMP     EQU   X'2020'
                         0200 1146 SMOD     EQU   X'200'
                         00C5 1147 E        EQU   X'C5'
   1FFE                       1148          ORG   X'1FFE'      DO NOT MOVE THIS ADDRESS
   1FFE 0A3C             1FFF 1149          DC    AL2(RTNLDR)  ADDR FOR 893 TO RETURN TO FC8
                              1150          TREP
                              1151          TREP
                              1152          TREP
                              1153          TREP
                              1154          TREP
                              1155          TREP
                              1156          TREP
                              1157          TREP
                              1158          TREP
                         FFFF 1159          END
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ADDBAK	A	0C5	13B1	0898	0880 0888
ADREXT	A	0C1	1200	0730	0702 0717
AGAIN	A	004	0A4A	0045	0034
ALC	A	C04	113F	0612	0614
ALTDFC	A	002	1188	0667	0751
ARDDFC	A	001	1189	0668	0667 0754 0765* 0773*
ARR	C	0C1	0008	1128	0389 0433 0521 0573 0605 0629 0691
ASK	A	004	0D06	0197	0218
ASKFR	A	004	0C24	0119	0144
A0	A	003	0A0C	0015	0046
BASE1	A	001	1159	0630	0604 06C6 0627 0628 0677 0741 0742 0769
BLANK	A	006	1759	1073	0233 0280
BLKCNT	A	001	10C7	0551	0480* 0487*
BUFFB	A	002	10CE	0555	0270 027C* 0481 0503 0511*
BUFLG	A	001	10CC	0554	0265* 0269* 0509
BUMP	A	003	13CB	0908	0905 0912
BUSY	C	001	00A2	0623	0706 0711 0734 0753
CARDIN	A	004	0C8C	0161	0117 0166 0172 0534
CKCYL0	A	C03	139F	0891	0875
CKFIXD	A	003	1352	0856	0854
CKZERO	A	0C3	1388	0882	0889
CNT	A	001	1753	1072	0295* 03C1* 0336* 0343*
COUNT	A	002	10C9	0552	0483 0504 0511
COUNT9	A	002	10CB	0553	0576
CRTFLG	C	001	0879	0564	0449 0454*
CS00C8	A	002	174C	1070	0291
CTLREG	C	001	00AE	0624	0696* 0698 0704* 0709* 0714* 0751* 0763*
CVTCTH	A	003	1370	0872	0870
CVTSTR	A	C04	1386	0901	0893 0896
CYSTRT	A	001	1371	0873	0865*
C11	A	003	0A0F	0016	0048 0072
DATAB	A	002	10D3	0557	0482 0502
DBUF	A	001	1648	1068	0035* 0040 0339* 0665 1029
DBUFB	A	001	1186	0666	
DCPBUF	C	001	0880	0562	0495 0557
DDCF	A	001	15D7	1034	0801* 0915* 0916* 0917* 0954* 1026
DDCFB	A	010	1602	1C60	0798
DDCFE	A	001	15E0	1042	0798* 0933
DDCX	A	001	15EB	1047	1028
DDCZ	A	001	15F4	1055	0933* 0934*
DDDF	A	001	15E1	1044	0941 0953* 1027
DDZL	A	002	15F6	1056	0934
DEFLT	A	006	0DD4	0274	0216
DFDR	A	C02	1186	0665	0636 0732
DFTN	A	006	0DE2	0276	0274
DISK33	A	004	12BD	0796	0694
DISK54	A	001	11A6	0695	0797
DISPLY	A	004	0FD7	0449	0434
DKERA	A	006	14A7	0974	0996
DKER2	A	C06	148C	0965	0939
DKER4	A	C06	1495	0968	0949
DKER9	A	006	149E	0971	0932 0960
DKNR	A	003	1480	0963	0800
DRV32	A	001	15F7	1058	0925
DSKCYL	A	001	1174	0680	
DSKDRV	A	C01	1192	0676	
DSKER	A	032	12BC	0790	0759
DSKERR	A	001	121A	0750	0738
DSKFCT	A	001	15F8	1059	0922* 0923* 0924
DSKFLG	A	C01	1173	0679	
DSKM32	A	001	0BC0	0103	0098
DSKM33	A	037	0BF8	0105	0074 0CC4 0098 0C99 0102
DSKND	A	050	129C	0789	0784
DSKNUM	A	001	1176	0682	
DSKSEC	A	001	1175	0681	0291* 0293* 0332* 0848
DSKTYP	A	0C1	0A95	0C71	0045* 0093* 0095* 0178 0796

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
DSNS	A	001	1602	1063	1030
DSNSE	A	024	161A	1064	0999
DUMP	C	001	2020	1145	
E	C	001	00C5	1147	
END	A	002	0A1F	0022	0392 C359 0414
ENDINT	A	004	10A9	0527	0521*
ENDS	A	004	1124	0551	0573*
ENHLT	A	002	0D66	0238	0234* 0244* 0246
EOI	A	003	0FC5	0430	0393
ERASE	A	001	10C6	0550	0162* 0177* 0264* 0462 0472*
ERRMSG	A	004	12ED	0836	0877 0892 0909
ERRMSL	A	051	1331	0843	0839
ERROR	A	004	10AD	0532	0526
EXIT	A	005	13E1	0914	0903
EXTSAV	A	002	117C	0660	0766* 0772
FILFND	A	001	0ED9	0331	0299
FORTEN	A	001	12DD	0822	0886 0898
FOUR	A	001	12DC	0821	0911
FWDSEK	A	003	11EE	0723	0718
F1	A	002	1778	1078	0170
GPCS	A	001	1332	0845	0819
HALT	C	001	0222	1142	C063 0100 0136 0155 0210 0237 0259 0312 0320 0452 0532 0761 0786 084C 1009
HEADWA	A	001	12E7	0829	0901* 0910* 0914
HEX20	A	001	12D8	0820	0906
IAR1	C	001	00C0	1129	0466* 0469* 0484* 0506* 0579* 0583* 0587*
ID14	A	003	0A12	0017	0035 0040* 0116 0195
INMSG	A	015	0AF9	0085	0052 0053 0057
INMSGS	A	001	0AB8	0083	0052
INMSG1	A	005	082C	0087	0057 0058 0061
INMSG2	A	022	0B71	0089	0061 0062 0080
INMSG3	A	043	CB9C	0090	0069* 0077* 0080 0081
INPUT	A	010	0A1C	0019	0C22 0377 0378 0379
INPUTB	A	002	0F42	0377	0387 0388 0577 0590
INPUTA	A	001	100B	0567	0164 0180 0271
INPUTN	A	002	0F44	0378	
INPUTS	A	004	10DB	0573	
INS	A	004	0A5D	0050	0082
INS1	A	004	0A96	0072	0047
INS4	A	004	0AA2	0075	0066
INS5	A	004	0BAC	0095	0068 0073
INS6	A	004	0BA5	0093	0049 0076
INS8	A	0C4	0AB0	0078	0070
INTB	A	002	1005	0558	0469 0484 0506 0579 0583 0587
INTAKN	A	004	1092	0521	0471 0486 0508 0582 0584 0589
INTERR	A	004	1096	0522	0523
INTFLG	A	001	1006	0559	0522 0524* 0542*
IOBCHN	A	004	12EB	0831	0848* 0850* 0853 0856 0872* 0874 0876 0878* 0882 0885* 0886* 0891 0895* 0898* 0902 0904 0906* 0908 0911* 0914* 0915 0916 0917
IOBQB	A	001	12EC	0832	0849* 0850 0867* 0866* 0871*
LASTB	A	002	118E	0672	0704
LASTAD	A	001	1190	0674	0707 0712* 0716 0719 0725 0729*
LBUF	A	002	15D4	1029	0946
LDCF	A	002	15CE	1026	0927 0945
LDCX	A	002	15D2	1028	0935
LDDF	A	002	15D0	1027	0928 0936 0956
LDPARM	A	003	119B	0692	0775 0788
LENGTH	A	001	0F49	0381	0278 0281 0282 0391* 0405* 0421
LINK	C	001	0216	1139	0314 0322 0349 0842 1011
LI033	A	0C1	144F	0944	
LNG	C	001	000A	0021	0377 0379
LOAD	C	001	022A	1143	0037
LOADFL	A	001	184F	1113	0033 0041*
LOADNS	A	004	1066	0502	0499
LSNS	A	002	15D6	1030	0993
MAKRDY	A	003	0FEF	0459	0456

FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
MLTAF	A	006	1752	1071	0233* 0236 0249 0274* 0280* 0283 0298
MODEL	C	001	0200	1136	
MVCC	A	006	0EF1	0339	0344
MVCF	A	0C1	0E07	0287	0281*
MVCFB	A	0C1	0EF6	0340	0338* 0342*
MVCL	A	001	0E06	0286	0282*
M15	A	004	0DA7	0263	0196
M8EXIT	A	C04	0C44	0132	
M8MG2	A	028	1868	1114	0119* 0125*
M8MG3	A	032	1888	1115	0120* 0124 0126* 0130
M8MG4	A	022	18A1	1116	0135 0145 0208 0257
M8MG5	A	020	18E9	1118	0200
M8MG5B	A	029	1906	1119	0204
M8MG6	A	018	1949	1121	0223
M8MG7	A	043	1974	1122	0231
M8MG7A	A	049	19A5	1123	0227
M9MG8	A	023	19DA	1125	0253
M8MG8A	A	030	19C3	1124	0249*
NAME	A	0C6	0D88	0249	0243
NDMSG	A	042	0F40	0350	0348
NEG	A	002	0F4B	0382	0430
NEWDRV	A	005	1358	0865	0857
NG256	A	002	1128	0598	0342
NODFT	A	004	0DE3	0278	0273
NOFIL	A	046	0EA2	0323	0310
NOSP	A	004	0E61	0315	0334
NOSPC	A	004	0ED8	0326	0318
NOSPN	A	C01	0EB2	0324	0111* 0114*
NOTOPN	A	0C4	0E4D	0307	0297
NOTRDY	A	004	1258	0781	0697
NRDY	C	001	0018	0565	0456
NPMDFC	A	002	1184	0664	0689 0696 0763 077C
NTRDY	C	001	00A0	0625	0738
NUMSEC	A	0C3	0EDE	0333	0110* 0113* 0115
NXTLNE	A	004	1023	0482	0488
NXTSTR	A	002	0F46	0379	0390 0392 0396* 0399 0408* 0413 0414 0420* 0427* 0590*
OFF	A	004	0BA0	0091	0069
OK	A	001	11D3	0713	0708
ON	A	004	0BA4	0092	0077
ONE	A	002	1170	0652	0187 0244 0301 0343 0487 0885 0895 0910
ONESEC	A	0C2	117A	0659	0303 0612
OPEN	A	0C6	0E09	0291	0261 0275
OPEN1	A	003	0E20	0296	0302
OVLMSG	A	018	1827	1089	0145* 0154
PASOVR	A	003	1018	0479	0489*
PD30	A	001	1542	1017	0978
PD31	A	020	157C	1020	0965* 0968* 0971* 0974* 0978 0979 0981* 0982 0982*
PD35	A	020	1590	1021	0965
PD43	A	020	15A4	1022	0968
PD46	A	020	15B8	1023	0971
PD48	A	020	15CC	1024	0974
PENDNG	A	004	10B7	0E42	0558
POS	A	002	0F40	0383	0423
POSCSR	A	0C3	10D1	0556	0505 0578
PRIDEF	A	001	1466	0952	0942
PRINT	C	001	021A	1140	0050 0055 0C59 007E 0096 0121 0127 0132 0147 0151 0197 0201 0205 0220 0224 0228 0250 0254 0307 0315 0345 0756 0781 0836 0976 0988 1001 1005
PRTNR	A	004	14AD	0976	0963 0966 0969 0972
PSMS	A	048	164A	1065	1000 1008
PSR	C	001	0004	0385	0423* 0430*
PTEXT	A	004	0FD3	0435	0512
PTXR	A	0C1	0FD6	0436	0433*
PT32	A	0C4	1052	0496	0501
PT32XX	A	004	1044	0493	0464 0479
PT5471	A	004	0FCB	0433	0163 0179 0266 0268

FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
QBPTR	A	001	0CFA	0192	0185*
QBTBL	A	001	1829	1091	0183
RDDFC	A	001	1173	0654	0303* 0304 06C9* 0612* 0613 0633* 0664 0679 0680 0681 0682 0690 0749 0771 0773
RDDGF	A	029	1542	1016	1003 1004
RDDGS	A	001	1525	1015	1003
RDNXT	A	004	0E18	0294	0306
RDWRT	A	003	1457	0947	0924* 0925*
RDY	A	004	0FFB	0463	0457
READ	A	001	114E	0622	0292 0294
RECABB	A	002	117E	0661	0709
RECARD	A	001	118D	0678	
RESET	A	003	108F	0544	0545 0561
RESETB	A	002	10DA	0561	0466
RTNLDR	A	006	0A3C	0040	1149
RTN1	A	001	0A20	0023	0013
R1	A	002	1775	1076	0168
SARR	A	0C1	116E	0640	0629*
SAVPRM	A	004	1242	0766	0764
SBX	A	001	0CF4	0190	0158* 0174* 0182*
SBYTE4	C	001	020C	1137	
SBYTE5	C	001	020D	1138	0036* 0042* 0065 0067 0075
SCANEX	A	001	0FBD	0425	0389*
SCANIN	A	004	0F50	0387	0165 0272
SCAN1	A	003	0F57	0390	0397
SCAN2	A	0C5	0F72	0399	0395 0409
SCAN3	A	001	0F96	0411	0400 0402 0404
SCAN4	A	003	0F96	0413	0428
SCAN5	A	004	0FBA	0424	0422 0431
SCAN51	A	003	0FB1	0421	0415 0419
SCAN6	A	004	0FBE	0427	0417
SCNTS	A	004	0EE5	0336	0115*
SCRCH	A	001	11FA	0727	0719* 0720* 0724* 072E*
SENSE	A	002	1178	0658	0698* 0700 0714
SETADB	A	003	11F9	0728	0721
SETAGN	A	004	0CE2	0184	0193
SETALT	A	003	123F	0765	0755
SETDN	A	001	0CFF	0194	0188 0279
SETFIL	A	004	0CDE	0183	0159 0176 0181
SETF1	A	004	0CDA	0182	0142 0171
SETR1	A	004	0CBC	0174	0169
SETXR1	A	001	1212	0739	0691* 0692 0766 0772* 0950
SET17S	A	004	0C00	0110	
SET9S	A	004	0C0D	0113	0109
SEX	A	001	0A00	0003	
SIO	A	003	1203	0733	0693* 0845 0922 1107
SIOI	C	001	0018	0563	0459 0460 0467 0544 0580
SIO33	A	003	143D	0937	0961
SMOD	C	001	0200	1146	
SSW2C	C	001	0008	1134	0036 0042
SSW2D	C	001	0004	1135	0067 0078
SSW2E	C	001	0002	1133	0065
SSW20	C	001	0080	1130	
SSW23	C	001	0010	1131	
SSW24	C	0C1	0008	1132	
STARTN	A	001	12E8	0830	0846 0847
STATOT	A	026	1525	1014	0987 0990 0991
STATST	A	001	1508	1013	0990
STATUS	A	002	10D8	0560	0525 0543* 0585 0799* 0983* 0986
STPARM	A	003	1198	0691	0767
STRTIO	A	001	1195	0688	0607 0610 0631 0634
SVNTEN	A	001	12DE	0823	0878
SWHLT	A	004	0D61	0237	0247
SXR2	A	001	116A	0638	0626
SYMPTR	A	002	0F48	0380	0167 0284 0406*
S17	A	002	184E	1112	0111

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
S9	A	002	184C	1111	0114
TABLE	C	001	2001	1109	0337
TABLES	A	001	12DF	0824	0851 0852
TM15	A	006	0C17	0115	0112
TRYAGN	A	004	10F5	0579	0586
TWO	A	002	1172	0653	0184
UDT	C	001	0232	1144	
UNPACK	C	001	021E	1141	0984 0997
UPCYLN	A	005	13A9	0895	0883
WORK	A	002	1129	0597	0139* 0140* 0141 0143 0213* 0214* 0215 0217 0240* 0241 0242
WRITE	A	004	112C	0605	0341
WRTXB	A	001	114D	0616	0605*
XKFCX	C	001	2004	1110	0108
XLC	A	006	0E3B	0303	0305
XMSG1	A	001	175A	1074	0161
XMSG2	A	001	177E	1081	0263
XMSG3	A	001	17B3	1084	0267
XMSG4	A	001	17E2	1087	0150 0178
XNE	A	002	0F4F	0384	0396 0405 0420 0427
XR1	C	001	0001	1126	0161* 0167* 0168 017C 0178* 0263* 0267* 0284* 0285 0293 0296 0298 0300 0300* 0332 0333 0337* 0338 0387* 0388 0389 0390 0391 0392 0396 0396 0397 0399 0405 0405 0406 0408 0409 0413 0414 0420 0420 0421 0423 0427 0427 0428 0430 0431 0496 0497 0497* 0498 0636* 0692* 0693 0699 0700* 0715 0716 0720 0723 0724 0728 0729 0736 0740* 0743 0846 0847* 0849 0850 0850 0853 0856 0867 0869 0871 0872 0874 0876 0878 0882 0885 0886 0891 0895 0898 0902 0904 0906 0908 0911 0914
XR2	C	001	0002	1127	0183* 0184* 0185 0186 0186* 0187* 0189 0191* 0235* 0241 0245 0245* 0283* 0285 0390* 0394 0401 0403 0406 0407 0407* 0408 0413* 0416 0418 0495* 0496 0500 0500* 0604 0606* 0607 0609 0610 0612 0612 0613 0626* 0627* 0628 0629 0631 0633 0634 0636 0637* 0689 0689* 0691 0692 0693 0696 0697 0698 0700 0704 0706 0707 0709 0711 0712 0714 0716 0719 0719 0720 0724 0725 0725 0729 0732 0734 0738 0741* 0751 0753 0754 0763 0765 0766 0766 0767 0770 0770* 0772 0772 0773 0773 0775 0788 0851 0852* 0855 0855* 0858 0858* 0865 0867 0868
Z1	A	001	1137	0608	1092
Z10	A	003	121A	0781	1101
Z11	A	003	121D	0782	1102
Z12	A	003	1239	0763	1103
Z13	A	001	1249	0768	1104
Z14	A	003	11A6	0696	1105
Z15	A	001	113E	0611	1106
Z2	A	001	115C	0632	1093
Z3	A	001	1163	0635	1094
Z4	A	003	1188	0704	1095
Z5	A	003	1186	0705	1096
Z6	A	003	11C7	0709	1097
Z7	A	003	11CA	0710	1098
Z8	A	003	11D3	0714	1099
Z9	A	003	1200	0732	1100

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

THE CHARACTER ' INDICATES A BLANK COLUMN AND THE CHARACTERS D E H INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

```
 GBK GBD  PN 42  34264 EC 825023  FC7 MICRO UPDATE  PROGRAM MOD 15  84888488 ........ ........
                                                                                        FC800000
T+←Y:"H      BSC  "":  <D  A££ DA  £DA £DA £DA B/0  A |""|& GL"HAGOO  KEV8MDTYH -7 /0H  DB(- ‡1HFC800001
T+←Z5U00K8/MOPT3  "FD8#8 H(|  HVL-  -8-?2UDD8H Y+0I  .Z+BG /Z8|-.9E|"  /0HE T<..<BG /Y  6J£% =E8FC800002
T+←D0**BG SHI"3-  B -72DA88A H(0A  .. 0CE90.Y|HGF0  8H Y+0A ..<BGB"U  8A H(0I .Z60CB90  .Z< ‡88FC800003
T+←../0HE S%.X<B  GBV5 8>TS88PN£<T  A8UCB5>|N£+|H1NC  5°|L4£<GN1DC38"L  0£<LI8_I 1<PF2)P  E1D 4£YFC800004
T+←%W2)N 8_¬U84C  T0*.L1N_ 5°|E0:.  E£<XD1)PT2+$Y£<X  N5=LT£<LE9*XC1NC  F5_V 8>TS88PN£<L  I8_H 01-FC800005
T+←_/£(¬A0°I.£+|  U6)N 5_N 5_PL:DC  C£*N £%PN£%N £>8  I88|N£E1*£+.S9UC  21NCF5_V °¬L4°DA  *PD  080FC800006
T+←>*8>.W£|.D£<8  O6NC38"L0K4CF5>L  N1DCT2<GT£+.S9UC  21DCA5*J 8>.W£|.  E£<GR1NCE5>|N£(8  F1U% ‡-%FC800007
T+←?P5%$FK°$N£D%  8N DN8Y)(|C<HV*B  G /YG+ ?8OH*BHYX  "8Y*8£(¬L0*|E£+.  Y£>|E5DCP0*|K£(8  N£<£ Q.NFC800008
T+←0K6*XV1NC2K4A  5<GK1NCR1*6D:D_  £(XE8%PT£<TA4=(  .|¬ -A|HACLOJC_8  < £:2FD#2/0Y8B6#  ¬C 0 88BFC800009
T+←1(C.MQL 0 C>Q  +73--8/G2DF-86J/  D||DOS88G /YA|AS  .|<QQET3OFH? /0H  E LOQS88G /YFE/S  /0H* 9L4FC800010
T+←2H SHI"3 DKU  #8ADZ|£ JH¬HA1L4  ACKX £0UCAN01JS  /0H*8F-DPE"T /0H  EAS-Q1*8G SHI8C2  #C|6 =.NFC800011
T+←3C8Y)K0-0POTD  D<8 /0".0H*668B  GC5C A 2<(£D|KA4  AE7N 8YD<G6DP:0C  2-K. /02<|.%<°C4  38ZN JKUFC800012
T+←3=8YDP+Y £1%H  AE=. /0".0H*£6"H  GAC2:C|LB /-Y(-H  J*T£BC|D5 - 6 /E  O8YD.>0- 0-H <8  GC+H E9UFC800013
T+←49+8 MD¬N£Y*8  G /YAKATZOH*BF-D  )F£8 /0HEA/GOV*B  G SHI"3 DKU8BAD  Z|£DJH¬HAYL4 DKX  £4 EL-FC800014
T+←54A%BG /YA£1V  IOH*BF-D1FEP /0H  EAS%R) 0EE5HPCL3  1COS8 /)(0N*BHYX  1< JHQ0 ADZ|N  JH¬H "/$FC800015
T+←6?-JD+ 5WDPC  S -D°°05W0 D(Q£0  EF*<PN%BG /YA(JX  EOH*BF-QDFHG /0H  SS-C2/6.8 J)=+Y  £1TY 3-8FC800016
T+←7D-AC<0H*|2BH  AE#| /0".+8 £3 £  AD<8&3%BGD(? /0°  £8Y&|C NPH-7S8Y*  %05?N0°XI|&N|K*8  DC|8 &8NFC800017
T+←8VC NPN/3RC  +A0°IC +A-°IO-H  PLLNAC4S* 0 C D  J)J)<0H*JL/0ADPN  %0H*JLTO<E5(°"0C  2-K* *JNFC800018
T+←9-L&NPE5.2-E?  K JN| A)LDPC £8  -C-DJ)JE:<F J)*  $CT? /08O0H*BF%*  >CDHI=*8G SHI=*8  G /0 ¬:UFC800019
T+←:8OH*BF%*6C_S  I°8BG SHI°8BG /8  C5>LL1DCA5>( 1%X  N1DCN2*|R5WCC5%L  E6(9B4*PC84CF2)|  E6(0 3 MFC800020
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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-8O5NCD2:.K&+|	M1)XE&<GR1MCN5>(	9=) 8%PC8*8R8UC	A4*|O08GT1*J 8*R	5<XC6)R-0*8D1MA	1%U 9&DFC800021
T+-8J488* JE5BG4	E<BBCWD8 A)L(&D	- L&AC?Q<"1)M C	/1D%COD+*/D.C0	PM1E00 D+8*8G /Y	GH-8 LL<FC800022
T+-*<&<BG /8N2*|	REWCC5%LE&<TA8UC	B1*PN&<|O58XE1DC	TSUCS:+.T1)J 586	C4U HD0Y*8/<	- :.MFC800023
T+-=GA AO-D|6X&	H:7MBAG3"A44AA V-	-8YJ-1M 8-DGP-D	DC)8GEM4AA Y-8Y&	*1M 8YDD?D% 8YD	&P- 08DFC800024
T+-"8A054 -8S -E	4 -L&/3A5 -J(&&	HG"HOO.5 |HAE85	. |HAAE8.J 5*"0-	2-6(5A ? /0 P-D	DC) O&8FC800025
T+-"'/5J5A X6/7-	4B "OOH*|58BG	8"0/98/ FOH*8HYX	X||8M:*DQC="2/03	3FHC3F+ (GO"5C"M	8-A 78 FC800026
T+/ 81?M&&TP D(.	3F C50ACN81CA0H*	&UT> D<&2A2U8A/C	G<J &3TD8D(<1D/C	I(* &5-<&U*8GDIH	| A :Z<FC800027
T+/A311E0C D&M32	GDAU8& T"CHNH"-T	"0-HN-IO CK &E	C2-&-S -G /1A	K<J%&43D&D<81D/C	I<JM 3-0FC800028
T+/8>D(D&0ACN81B	JCH*&UTS D<32U 0	+ JC+D<X /0"L(-	&.CS D(& UA8D*8	&STUHD(-2U L /0	0H* :-"FC800029
T+/CZ SHI:<BGCH0	:-ACD<A066|<G 88	GC.8 A& U	R H-AE7 D.8	4BADK|D H"028B|8	H"3D &8HFC800030
T+/DUD/C.<JX|&TD	&D(D&0ACN81-AB1	0+*&UTP D(P /1B	K|L466< AD|H50AC	N81AJ0H*6U-0AC40	|6% K/*FC800031
T+/E-/0 C" C&	HDH?8 /ER8H*8B.0	G;8G| D> J0/>F	*CA J|8BG CB /E	D0-HJO8&HE:8G| S	8 A4).*FC800032
T+/FE8H*0B8NA.*H	B C /0 D -	B D J-0	|0J*1R.D0U	D08 DNW5 S>	4B18 =:DFC800033
T+/GN_&F-W +J <B	GD.61./6/V+D0.-N	9A0B5 6P2UDS1./?	3D&G/YU>9 132D 2	1.-?30 C/YVD8 A6	1.-H R8WFC800034
T+/HE- C8& AG-H	AH|HD8:0 /16- H*	A8Y*.:-D8X 8G E8	/158 ++ A4A%ED	L8: 8EML:0D88EB	X0-D #&UFC800035
T+/I. CB /ER4H*	AR&8N8:UA8EH_?6H	C8YOOCH*8F%+-D.2	I"<8G SHI".F>D-H	G #0AED0ABR"-/2M	H_&H "JWFC800036
T+/WFH:0AX0W% /U	C8H*VOH*8F%*2DZ2	I"=8G SHI">8GH&L	I8_I 5)8T&(XE0*L	YE4CN0).E6<818&FE	6-D 194FC800037
T+/.A&(XE0*LY6<G	N1DCR1:.E84CH0)|	T&<LI8_I 1)XR&_V	.&(XE8%PT6<TA4=(	8*R 64PT6:/ |L<	HV* O80FC800038
T+/.8 JF#C UN8AQ	8<<4&6<GHEHU8 AP	POH*0L<S DEA- C*8	32HXH%O	<8 G /DG<1<10H*8HYX	:0H* JH4FC800039
T+/<7 /8L5*G848N	8*R 0*8N9*PR84C	5*|L46<GC1(XE8>I	2)PT5UCA&!|3*|A	04LD6*PSEUT8 J.	YC D "RDFC800040
T+/(2D>YJ)H0 AAH	DP CA<H8C_*8D |	2U |S -J88 |2D |	S -H% A(I 0- A B	88 A:8 L2D (88 J	B =6*FC800041
T+/+_-6&A8YHW-*%	A0 HK*H8 J.:8YH	Z-6 A8YD8L- DPA	| DK7-HBE%8GD8/	G J.._8Y*(L-	DP KS-FC800042

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/|Y8Y*EL- AD_4	8 J.X-6 88YD/:H	8DZ EL0 8D__"" .	/A._C- K91E0L0	8D_3 J|.L 8D>*	< AM P0<FC800043
T+/&T6J.YC N61.	2C N7A.DC N=AH	D+"-N= 0 EE-N= 8	EE-N*8GHE 813/P	+<*0N4||H <GIEA7	A2/6 H3WFC800044
T+/J:I*GHEI8<BJP	4E: < JP3E-Q13/P	K<*CN4||I *GHEDC	A2AK<+ HN8-H6E3G	+E*813APN88U 0*Y	NOXD EL0FC800045
T+/KR2AKN0H*KC30	AE:D8 JPP0*YH8TG	+E)C32 CA2JJ90*Y	N-*GHEI 8 /16*8V*	/CA<N-AO&8V*0CA<	N-AM :14FC800046
T+/LNZ|HGC00LEP0	N>|HGA-0LEP0N3<B	G /.B+/N8S-X8&AN	8CAHN:1N8<<4&6<B	G /88D(-NI*8G /D	8F/H :38FC800047
T+/H|I*GHE(Q13AP	O8BUG0*YH8*GHE!-	/OH:FAQEEU. /0H	E-14N6X8G /DF<AR	HOH*8HYX#CH*8EUC	S88D 8/WFC800048
T+/NH8=LS&<.Y88P	S&|A.8HCA6*N 9=-	X94CR1*GD8<LI0*)	8>|A8=LS&<.Y88P	S&<GR1HA 8<LI8_I	1(U QR8FC800049
T+/DE2:PE6DC2&(P	08*CR1*GD:DA/&*L	N2:(C8TEC"I &DA	&DA &DA &DA &DA	&DA &DA 0*8T1)V	6*H QL0FC800050
T+/P 0*J 2<E HDC	R8D_ 0*8T1)V 6*J	/9_XT6<LA88E K4C	A1>|E6HCS1*PK6<|	05(LA5*J.6<GF88P	R6(U 5K8FC800051
T+/P#1*GD6<LI0*)	0*LDE)*N8JP.EU%	0 0	M2 D	6.YFC800052
TA/08 D				:!*FC800053
T+/:E / &DA &D	&DA &DA 9%XL44C	S:+.T1)J 586C4UC	R9(N 1_X0S0CR8HC	06HCF8O8 18XV1HC	T2<N EC8FC800054
T+/- 6(PA5<N 5%R	:(8U6HC38?-?6DC	H2*|RE%CC8%LE6DC	00_GE0=(1%XL1N	2:(9%XL44CD1*8	A9(< *!HFC800055
T+/-6E4CP5>&E6HC	U54CD21.K6<GN1DC	P6*PS8UCE5:|E6HC	C5HCT2<N 8".7*4%	DLQJO1ESD8-J>1G	GD*Y *88FC800057
T+//1D)<K AHED/4	K+JIHDEQJ|JHC"**	0=-G7 <XF6+.Y8>|	E5DCP0*|K6+8I4*(	O%N 5_N 6-E.6+.	E84 85&FC800058
T+/SX6*XG2+|H5>.	T6<LA88E 8>8I88|	H6+|O6|GR1:.E84C	H0)|T6+|O6<|O5:|	I5:LE2*R 8>TS88P	H&(* 51*FC800059
T+/TXO*|K6(LIO*X	OQ<|O1<N 5%.J1*|	T6<8I48N 5*GN1HC	I8UA8O*LC6*V.6+.	E84CD0:|A6+.W6|J	-U NJUFC800060
T+/USBN?O88TE6:8	I8%N.6+.E84CD0:|	A6+.W6|J -UCOK8P	N88PR6<8I48N 5*G	N1HC16<|H0)V.6<G	T6<D 3Q FC800061
T+/V)6+|I5<N 2)N	1*.C1<XC6<|O1<N	9+.I5*) 1<GTCHC	S9UC3E"J.6*PS1:(	2<GL8=I 1?E-1?R	0:H :!0FC800062
T+/WQ6<PA08/ 08T	A6N_ 2:I 1)PT1)X	E1D?H0:).6(PA5<N	2:I *UCC2<GRK4A	0_|A5)I 9%XL44C	T1)U 08WFC800063
T+/XL5<XN0:|E6<P	N8*XYK8&I48N 5*G	N1HCT5UC81HCU6%P	D6<X56+-X9=-X94_	5(XE8>|A6:(2*R	2)N "J6FC80C064

FC80 MOVE FC7 MICRO-CODE FROM DIAG PACK TO SYS PACK MOD 15

OBJECT CARD LISTING

```
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

TA/XE0'$R6*PC80                                                                                E2HFC800065

T J""BTO                                                                                       ST-FC800066

****************  ****************  ****************  ****************  ****************  *****   FC800067

*  THIS PROGRAM   COPIES THE FC7 M  ICROCODE TO A SY  STEM PACK.  IF T  HE SYSTEM PACK I  S   *   FC800068

*  ON A 3340, IT   MUST BE ON D2 A  ND R1 AND F1 WIL  L REFER TO THE 3  340 SIMULATED AR  EAS.*   FC800069

*  THE PROGRAM W  ILL FIRST CALL I  N 893 AND CAUSE   THE FC7 MICRO CO  DE TO BE LOADED.      *   FC800070

*  IF THE 3277 O  PERATOR CONSOLE   IS INSTALLED, KE  Y IN THE REQUEST  ED INFORMATION A  ND  *   FC800071

*  INPUT IT BY D  EPRESSING ENTER.    OTHERWISE, FOL  LOW PRINTER INST  RUCTIONS AND SUP  PLY *   FC800072

*  DATA THROUGH   THE CONSOLE SWIT  CHES.                                                     *   FC800073

*  CAUTION    UD  T MUST BE CORREC  T BEFORE RUNNING   THIS PROGRAM.                          *   FC800074

****************  ****************  ****************  ****************  ****************  *****   FC800075

E""*E7*=-DC"PH$  =""7M&F|   |   C     F%   ASC   R A  SO   Q                 09320608730  62675=Y0FC800076
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LAST PAGE