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1. PURPOSE

ONE CARD PROGRAMS THAT PROVIDE THE C.E. WITH THE ABILITY TO EXERCISE VARIOUS FUNCTIONS OF THE 1130 SYSTEM. EACH CARD IS IDENTIFIED BY THE NUMBER IN COLUMNS 79 AND 80. THIS NUMBER REFERES TO A PARAGRAPH WITHIN THE APPENDIX.

2. REQUIREMENTS

THE C.E. MUST HAVE THE 1130 SYSTEM AND A MEANS TO ENTER THE PROGRAM.

3. USE PROCEDURE

3.1 SETUP AND OPERATION

CHECK EACH WRITE-UP FOR SWITCH SETTINGS BEFORE AND AFTER LOADING.

3.2 LOADING

THE PROGRAM IS LOADED IN IPL MODE FROM CARDS, PAPER TAPE OR MAY BE BIT-SWITCHED IN.

3.3 WAITS

WAITS ARE IDENTIFIED BY THE B-REGISTER. THEY HAVE THE FOLLOWING MEANING,

B-REG	3001	BIT SWITCH SETTINGS REQUIRED.
	3002	ONE PASS OF THE PROGRAM HAS BEEN COMPLETED.
	3003	NO INTERRUPT RECEIVED AFTER A WRITE COMMAND.
	3004	NO INTERRUPT RECEIVED AFTER A READ COMMAND.
	3005	NO INTERRUPT RECEIVED AFTER A CONTROL COMMAND.
	3006	ERROR, SEE INDIVIDUAL PROGRAM.
	3007	ERROR, SEE INDIVIDUAL PROGRAM.

3.4 TERMINATION

PRESS IMMEDIATE STOP. IF PROGRAM STOP IS PRESSED THE PROGRAM MAY NOT RUN BY PRESSING START BECAUSE INTERRUPT 5 IS ON.

3.5 RESTART

PRESS IMMEDIATE STOP AND RESET. PRELOADING SWITCHES MAY BE SET AS DESIRED. PRESS START. AT WAIT 1 MAKE REQUIRED BIT SWITCH SETTINGS.

4. PRINTOUTS

NONE EXCEPT FOR DEVICES THAT PRINT CHARCTERS ENTERED FROM THE BIT SWITCHES.

5. COMMENTS

IN MOST CASES A SPECIFIFIED 'LDX' MAY REPLACE A WAIT TO ALLOW RUNNING WITHOUT INTERRUPT. ERROR WAITS MAY BE REPLACED BY A 'NOP'. OTHER COMMENTS WILL BE FOUND IN EACH PROGRAM. AN INSTRUCTION FOLLOWED BY *A* WILL BE ALTERED. THIS IS DUE TO THE LIMITATIONS OF 1130 IPL MODE. THE ALTERED INSTRUCTION WILL FOLLOW THE *A*.

6. APPENDIX A

CHAR	1132	1403	KEY/BD	CON/PTR U/C	CON/PTR L/C	
A	C1	64	A000	3E	3C	3A001130
B	C2	25	8800	1A	18	3A001140
C	C3	26	8400	1E	1C	3A001150
D	C4	67	8200	32	30	3A001160
E	C5	68	8100	36	34	3A001170
F	C6	29	8080	12	10	3A001180
G	C7	2A	8040	16	14	3A001190
H	C8	6B	8020	26	24	3A001200
I	C9	2C	8010	22	20	3A001210
J	D1	58	5000	7E	7C	3A001220
K	D2	19	4800	5A	58	3A001230
L	D3	1A	4400	5E	5C	3A001240
M	D4	5B	4200	72	70	3A001250
N	D5	1C	4100	76	74	3A001260
O	D6	5D	4080	52	50	3A001270
P	D7	5E	4040	56	54	3A001280
Q	D8	1F	4020	66	64	3A001290
R	D9	20	4010	62	60	3A001300
S	E2	0D	2800	9A	98	3A001310
T	E3	0E	2400	9E	9C	3A001320
U	E4	4F	2200	B2	B0	3A001330
V	E5	10	2100	B6	B4	3A001340
W	E6	51	2080	92	90	3A001350
X	E7	52	2040	96	94	3A001360
Y	E8	13	2020	A6	A4	3A001370
Z	E9	54	2010	A2	A0	3A001380
0	F0	49	2000	C4		3A001390
1	F1	40	1000	FC		3A001400
2	F2	01	0800	D8	CONSOLE	3A001410
3	F3	02	0400	DC	PRINTER	3A001420
4	F4	43	0200	F0	CONTROLS	3A001430
5	F5	04	0100	F4	CARRIER	3A001440
6	F6	45	0080	D0	RETURN	3A001450
7	F7	46	0040	D4	81	3A001460
8	F8	07	0020	E4	TAB	3A001470
9	F9	08	0010	E0	41	3A001480
=	7E	4A	00A0	C2		3A001490
$	5B	62	4420	40	SPACE	3A001500
.	4B	6E	8420	00	21	3A001510
'	7D	08	0120	E6		3A001520
,	6B	16	2420	80	BACK/SPACE	3A001530
(	4D	57	8120	FE	11	3A001540
-	60	61	4000	84		3A001550
)	5D	2F	4120	F6	SHIFT TO RED	3A001560
+	4E	6D	80A0	DA	09	3A001570
/	61	4C	3000	BC		3A001580
*	5C	23	4220	D6	SHIFT TO BLACK	3A001590
&	50	15	8000	44	05	3A001600
SPACE	00	7F	0000	21		3A001610
NUMBER			0420	C0		3A001620
AT			0220	04	LINE FEED	3A001630
LS THN			8220	DE	SHIFT TO BLACK	3A001640
LOG/NOT			4060	F2	05	3A001650
SEM/CLM			40A0	D2		3A001660
QUOTE			0060	E2		3A001670
LOG/OR			8060	C6		3A001680
UNSCORE			2120	BE		3A001690
QST MK			2060	86		3A001700
COLON			0820	82		3A001710
GRT THN			20A0	46		3A001720
EXCLAIM			4820	42		3A001730
PERCENT			2220	06		3A001740
CENT			8820	02		3A001750
EOF			0008			3A001760
ER CHR			0004			3A001770
ER FLD			0002			3A001780
0-8-2			2820			3A001790


```
*************************************************** 3A001800
* PLOTTER BIT SWITCH CONTROL  * PAPER TAPE BIT SW * 3A001810
********************************* CONTROL AND BINARY* 3A001820
*                               * PATTERN DATA.     * 3A001830
*  BIT SWS     FUNCTION         ********************* 3A001840
*  0 AND 8 --- PEN DOWN         *                     3A001850
*  1 AND 9 --- DRUM DOWN        *                     3A001860
*  2 AND 10 -- DRUM UP          **      **    *      * 3A001870
*  3 AND 11 -- CARR. RIGHT      * *    *  * * * *  * * 3A001880
*  4 AND 12 -- CARR. LEFT       *   * *   0*.  * * *  3A001890
*  5 AND 13 -- PEN UP           *    *0   0 .    * 0 * 3A001900
* SET CHAR. 1 IN BIT SWS 0-5    *     0   0 .        * 3A001910
* SET CHAR. 2 IN BIT SWS 8-13   *     0     . 0 0 0 * 3A001920
*********************************     0     . 0 0   * 3A001930
*                               *     0     . 0   0 * 3A001940
*                               *     0     . 0     * 3A001950
*                               *     0     .   0 0 * 3A001960
*********************          *     0     .   0   * 3A001970
* DECIMAL TO HEX    *          *     0     .     0 * 3A001980
* CONVERSION TABLE  *          *     0     .       * 3A001990
*********************          *       0 0 . 0 0 0 * 3A002000
*   CYL   * BIT SW  *          *       0 0 . 0 0   * 3A002010
* NUMBER  * SETTING *          *       0 0 . 0   0 * 3A002020
* IN HEX  * IN HEX  *          *       0 0 . 0     * 3A002030
*********************          *       0 0 .   0 0 * 3A002040
*   10    *   0A    *          *       0 0 .   0   * 3A002050
*   20    *   14    *          *       0 0 .     0 * 3A002060
*   30    *   1E    *          *       0 0 .       * 3A002070
*   40    *   28    *          *       0   . 0 0 0 * 3A002080
*   50    *   32    *          *       0   . 0 0   * 3A002090
*   60    *   3C    *          *       0   . 0   0 * 3A002100
*   70    *   46    *          *       0   . 0     * 3A002110
*   80    *   50    *          *       0   .   0 0 * 3A002120
*   90    *   5A    *          *       0   .   0   * 3A002130
*   100   *   64    *          *       0   .     0 * 3A002140
*   110   *   6E    *          *       0   .       * 3A002150
*   120   *   78    *          *         0 . 0 0 0 * 3A002160
*   130   *   82    *          *         0 . 0 0   * 3A002170
*   140   *   8C    *          *         0 . 0   0 * 3A002180
*   150   *   96    *          *         0 . 0     * 3A002190
*   160   *   A0    *          *         0 .   0 0 * 3A002200
*   170   *   AA    *          *         0 .   0   * 3A002210
*   180   *   B4    *          *         0 .     0 * 3A002220
*   190   *   BE    *          *         0 .       * 3A002230
*   200   *   C8    *          *           . 0 0 0 * 3A002240
*********************          *           . 0 0   * 3A002250
*                               *           . 0   0 * 3A002260
*                               *           . 0     * 3A002270
*                               *           .   0 0 * 3A002280
*                               *           .   0   * 3A002290
* TO READ/COMPARE BINARY        *           .     0 * 3A002300
* PATTERN, LOAD TAPE HERE ----* *           .       * 3A002310
*                               *           .       * 3A002320
*                    PAPER      *           .       * 3A002330
*                    TAPE       ********************* 3A002340
*                    CHANNEL -- 8 7 6 5 4   3 2 1   3A002350
*                                                   3A002360
*              CHAR 1 BIT SWS -- 0 1 2 3 4   5 6 7   3A002370
*                                                   3A002380
*              CHAR 2 BIT SWS -- 8 9 1 1 1   1 1 1   3A002390
*                                0 0 0   0 0 0       3A002400
*                                                   3A002410
*************************************************** 3A002420
```

```
                *************************************************** 3A002440
                *                                                   3A002450
6. 1 STORAGE CHECK  *  EACH CORE LOCATION IS CHECKED WITH A PATTERN  3A002460
                *  SET IN THE BIT SWITCHES. IF BIT 14 IS ON THE BIT 3A002470
                *  SWITCHES ARE USED AS AN ADDRESS TO BE CHECKED    3A002480
                *  AND THE PATTERN IS /5555.                        3A002490
                *                                                   3A002500
   A. PRELOAD SWS   *  BIT SW 15- HALT AFTER ONE PASS.              3A002510
                *        14- USE ONE ADDRESS                        3A002520
                *         3-  4 K MEMORY                            3A002530
                *         2-  8 K                                   3A002540
                *         1- 16 K                                   3A002550
                *         0- 32 K                                   3A002560
                *                                                   3A002570
   B. LOADING       *  IPL MODE FROM CARDS OR PAPER TAPE.           3A002580
                *                                                   3A002590
   C. WAIT      1   *  SET PATTERN OR ADDRESS IN BIT SWITCHES.       3A002600
                *                                                   3A002610
                2   *  ONE PASS COMPLETED, PRESS START TO CONTINUE.  3A002620
                *                                                   3A002630
                6   *  PATTERN CHANGED. THE BIT THAT WAS DROPPED OR  3A002640
                *  PICKED IS ON IN THE ACCUMULATOR. FAILING ADDRESS 3A002650
                *  IS IN ADDRESS LOCATION 2. PRESS START TO         3A002660
                *  CONTINUE OR DO A RESTART.                        3A002670
                *                                                   3A002680
   D. RESTART       *  PRESS IMMEDIATE STOP AND RESET. PRELOADING   3A002690
                *  SWITCHES MAY BE SET AS DESIRED. PRESS START.     3A002700
                *                                                   3A002710
   E. COMMENTS      *  THIS PROGRAM WILL WRITE AND READ ALL CORE     3A002720
                *  ADDRESSES OUT SIDE THE PROGRAM AREA.             3A002730
                *  EACH ADDRESS IS WRITTEN AND CHECKED 2 TIMES.     3A002740
                *  IF AN ADDRESS IS FOUND TO BE A PROBLEM, SET BIT  3A002750
                *  14 ON AND RESTART. PLACE THE ADDRESS IN THE BIT  3A002760
                *  SWITCHES AT WAIT 1.                              3A002770
                *  THE PROGRAM WILL CHECK ONLY THAT ADDRESS WITH    3A002780
                *  THE PATTERN /5555.                               3A002790
                *                                                   3A002800
                *************************************************** 3A002810
                      ABS                                          3A002820
0000                  ORG    0                                     3A002830
0000 0 6009           LDX    STGST                                 3A002840
0001 0 0000     STGSW DC     *-*       BIT SWITCH STG              3A002850
0002 0 0000     STGLC DC     *-*       ADRS LOCATION               3A002860
0003 0 0000     STGPN DC     *-*       STORAGE PATTERN             3A002870
0004 0 0000     STGCR DC     *-*       SIZE OF CORE                3A002880
0005 0 0000     STGHL DC     *-*       BIT 15- HALT                3A002890
                *                      BIT 14- USE 1 ADRS          3A002900
0006 0 0001     STGRD DC     /0001                                 3A002910
0007 0 003A           DC     /003A  *A* DC     /3A00  RD BIT SW    3A002920
0008 0 0015     STGXX DC     /0015     CONSTANT                    3A002930
0009 0 603F     STGST LDX    STGBD  *A* LD     STGXX               3A002940
000A 0 1006           SLA    6         * PATTERN TO USE            3A002950
000B 0 E8FC           OR     STGXX     * UNLESS ALTERNATE          3A002960
000C 0 1006           SLA    6         * IS SELECTED               3A002970
000D 0 E8FA           OR     STGXX                                 3A002980
000E 0 D0F4           STO    STGPN                                 3A002990
000F 0 08F6           XIO    STGRD     READ BIT SWS                3A003000
0010 0 C0F0           LD     STGSW     GET BIT SW SETTINGS         3A003010
0011 0 D0F3           STO    STGHL     SET HALT IF B 15 ON         3A003020
0012 0 1802           SRA    2                                     3A003030
0013 0 1002           SLA    2                                     3A003040
0014 0 90F1           S      STGRD     ADJ CORE SIZE               3A003050
0015 0 D0FE           STO    STGCR     STORE CORE SIZE             3A003060
0016 0 3001           WAIT   1         SET SWS FOR PATTERN          3A003070
                *                      * OR ADDRESS                3A003080
0017 0 08EE           XIO    STGRD     READ BIT SWS                3A003090
0018 0 C0E8           LD     STGSW     GET BIT SW SETTINGS         3A003100
0019 0 1800           RTE    16        * AND SAVE IN Q REG         3A003110
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001A 0 C0EA           LD     STGHL     GET CNTL WORD               3A003120
001B 0 1801           SRA    1                                     3A003130
001C 0 4804           BSC    E         USE SWS AS ADRS             3A003140
001D 0 7003           MDX    STG7      * YES                       3A003150
001E 0 18D0           RTE    16        * NO                        3A003160
001F 0 D0E3           STO    STGPN                                 3A003170
0020 0 7002           MDX    STG0                                  3A003180
0021 0 18D0     STG7  RTE    16                                    3A003190
0022 0 D0E1           STO    STGCR     SET ADRS IN CORE SIZE       3A003200
0023 0 C0E0     STG0  LD     STGCR     LD CORE SIZE                3A003210
0024 0 D0DD           STO    STGLC     STORE IN XR 2               3A003220
0025 0 C0DD     STG1  LD     STGPN     LD PATTERN TO USE           3A003230
0026 0 00D2     STG2  DC     /00D2  *A* TO STO  2 0                3A003240
0027 0 00C2           DC     /00C2  *A* TO LD   2 0                3A003250
0028 0 1000           NOP                                          3A003260
0029 0 F0DC           EOR    STGRD     CHG BIT 15                  3A003270
002A 0 00D2     STG3  DC     /00D2  *A* TO STO  2 0                3A003280
002B 0 00C2           DC     /00C2  *A* TO LD   2 0                3A003290
002C 0 F0D9           EOR    STGRD     CHG BIT 15 BACK             3A003300
002D 0 F0D5           EOR    STGPN     CK STARTING PATTERN         3A003310
002E 0 4820           BSC    Z         IS PATTERN THE SAME         3A003320
002F 0 3006           WAIT   6         * NO                        3A003330
0030 0 C0D4           LD     STGHL     * YES                       3A003340
0031 0 1801           SRA    1                                     3A003350
0032 0 4804           BSC    E         USE ONLY 1 ADRS             3A003360
0033 0 7006           MDX    STG10     * YES                       3A003370
0034 0 C0CD           LD     STGLC     * NO, GET ADRS              3A003380
0035 0 90D0           S      STGRD     REDUCE ADRS                 3A003390
0036 0 D0CB           STO    STGLC     STORE IN XR 2               3A003400
0037 0 9006           S      STGPG     SUB PROG SIZE               3A003410
0038 0 4830           BSC    Z-        REACHED LAST ADRS           3A003420
0039 0 70EB           MDX    STG1      * NO                        3A003430
003A 0 C0CA     STG10 LD     STGHL     * YES                       3A003440
003B 0 4804           BSC    E         HALT PROGRAM                3A003450
003C 0 3002           WAIT   2         * YES                       3A003460
003D 0 70E5           MDX    STG0      * NO                        3A003470
003E 0 003E     STGPG DC     STGPG     LAST ADRS OF PROG           3A003480
                *                                                  3A003490
                *             INITIALIZATION ROUTINE               3A003500
                *                                                  3A003510
003F 0 C009     STGBD LD     STGSP                                 3A003520
0040 0 D0C8           STO    STGST                                 3A003530
0041 0 C0C5           LD     STGRD+1   BUILD RD BIT SW IOCC        3A003540
0042 0 1008           SLA    8                                     3A003550
0043 0 D0C3           STO    STGRD+1                               3A003560
0044 0 C8E1           LDD    STG2      BUILD STO AND LD            3A003570
0045 0 18D8           RTE    24        * WITH XR 2                 3A003580
0046 0 D8DF           STD    STG2                                  3A003590
0047 0 D8E2           STD    STG3                                  3A003600
0048 0 6009     STGRS LDX    STGST     GO TO PGM START             3A003610
0049 0 C0FE     STGSP LD   X STGXX-1-STGST                         3A003620
                ************************************************** 3A003630
004A 0 0000           DC     0         SPACE FILLER                3A003640
004B 0 0040           DC     /0040     THE LAST FIVE WORDS ARE     3A003650
004C 0 9000           DC     /9000     * USED FOR PROGRAM          3A003660
004D 0 2000           DC     /2000     * IDENTIFICATION. THREE     3A003670
004E 0 2000           DC     /2000     * FOR THE PID AND TWO FOR   3A003680
004F 0 1000           DC     /1000     * SEQUENCE.                 3A003690
```

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                *************************************************** 3A003710
                *                                                   3A003720
6.02 CONSOLE    *  1. THE PROGRAM PRINTS ALTERNATE CHARACTERS OR    3A003730
     PRINTER    *     EXECUTES ALTERNATE CONTROL FUNCTIONS WHICH    3A003740
                *     HAVE BEEN SELECTED IN THE BIT SWITCHES.       3A003750
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE   3A003760
                *     DELAY BETWEEN XIO WRITE EXECUTIONS.           3A003770
                *  3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM    3A003780
                *     AFTER THE COMPLETION OF THE EXECUTION OF      3A003790
                *     AN ALTERNATE XIO SEQUENCE.                    3A003800
                *                                                   3A003810
   A. PRELOAD SWS *  1. IF DELAY IS DESIRED, SET DELAY CONTROL      3A003820
                *     VALUE IN BIT SWITCHES 1 THRU 13.              3A003830
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.       3A003840
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.       3A003850
                *  2. IF A WAIT AFTER EACH PROGRAM PASS IS          3A003860
                *     DESIRED, TURN ON BIT SWITCH 15.               3A003870
                *                                                   3A003880
   B. LOADING   *  LOAD IPL FROM CARD OR PAPER TAPE.                3A003890
                *                                                   3A003900
   C. WAITS   1 *  SET DESIRED CHAR/CONTROL CODES IN BIT SWITCHES   3A003910
                *  0 THRU 15. SEE PAGE 2 FOR BIT SW CODES.          3A003920
                *        1ST CHAR/CONTROL IN SWS 0 THRU 7.          3A003930
                *        2ND CHAR/CONTROL IN SWS 8 THRU 15.         3A003940
                *  DEPRESS START.                                   3A003950
                *                                                   3A003960
              2 *  NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN    3A003970
                *  SELECTED. DEPRESS START TO MAKE ANOTHER PASS.    3A003980
                *                                                   3A003990
              3 *  NO INTERRUPT GENERATED AFTER XIO WRITE           3A004000
                *  COMMAND WAS GIVEN. SEE COMMENTS.                 3A004010
                *                                                   3A004020
   D. RESTART   *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD   3A004030
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE            3A004040
                *     STOP AND RESET PUSH BUTTONS.                  3A004050
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.      3A004060
                *  3. DEPRESS START.                                3A004070
                *                                                   3A004080
   E. COMMENTS  *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.    3A004090
                *  2. IF PROGRAM LOOPS, CHECK Q REG FOR NOT RDY     3A004100
                *     OR BUSY DSW BITS BEING ON.                    3A004110
                *  3. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON     3A004120
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /602D   3A004130
                *     INTO LOCATION /002A AND DO A PROGRAM RESTART. 3A004140
                *  4. TO SET UP LOOP TO EXECUTE XIO, LOAD /602D     3A004150
                *     INTO LOCATION /002A AND LOAD /1000 INTO       3A004160
                *     LOCATION /0031 AND DO A PROGRAM RESTART.      3A004170
                *                                                   3A004180
                *************************************************** 3A004190
0000                    ORG     0                                   3A004200
0000 0 6012     CPBGN LDX       CPBLD   *A* TO LDX  CPRDS /6024     3A004210
0001 0 0001     CPONE DC        1         CONSTANT ONE              3A004220
0002 0 0006     CPBSW DC        CPDSW     BIT SW SAVE AREA          3A004230
0003 0 003A           DC        /003A   *A* TO /3A00 RD BIT SW      3A004240
0004 0 0006     CPWRT DC        CPDSW     CHARACTER ADDRESS         3A004250
0005 0 9000           DC        /9000   *A* TO /0900 XIO PRINT      3A004260
0006 0 0000     CPDSW DC        *-*       BIT SW READIN AREA        3A004270
0007 0 F010           DC        /F010   *A* TO /0F01 XIO SENSE      3A004280
0008 0 0000     CPSET DC        *-*       SW OPTION/DELAY SAVE      3A004290
0009 0 601D     CPCTL LDX       CPRDS     2ND CHAR SW/RESET MOD     3A004300
000A 0 0000           DC        *-*                                 3A004310
000B 0 0000     CPDSV DC        *-*       DSW SAVE AREA             3A004320
000C 0 002C           DC        CPIN4     INTERRUPT ADDRESS         3A004330
000D 0 1810     CPALT SRA       16        CLR 2ND CHAR SW           3A004340
000E 0 D0FA           STO       CPCTL     *                         3A004350
000F 0 7012           MDX       CPSEN     GO CHK IF PRINT BUSY      3A004360
0010 0 3002           WAIT      2         COMPLETED PROG PASS       3A004370
0011 0 700F           MDX       CPSEN-1   RESTART PROGRAM           3A004380
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```
0012 0 C0F2     CPBLD LD        CPWRT&1   BUILD WRITE IOCC          3A004390
0013 0 1804           SRA       4         *                         3A004400
0014 0 D0F0           STO       CPWRT&1   *                         3A004410
0015 0 C0F1           LD        CPDSW&1   BUILD SENSE RESET         3A004420
0016 0 1804           SRA       4         * DSW IOCC                3A004430
0017 0 D0EF           STO       CPDSW&1   *                         3A004440
0018 0 C0EA           LD        CPBSW&1   BUILD READ BIT SW         3A004450
0019 0 1008           SLA       8         * IOCC                    3A004460
001A 0 D0E8           STO       CPBSW&1   *                         3A004470
001B 0 C0ED           LD        CPCTL     SET UP RESET AND          3A004480
001C 0 D0E3           STO       CPBGN     * START BRANCH            3A004490
001D 0 08E4     CPRDS XIO       CPBSW     READ BIT SWS FOR          3A004500
001E 0 C0E7           LD        CPDSW     * PROG OPTS/DELAY         3A004510
001F 0 D0E8           STO       CPSET     *                         3A004520
0020 0 3001           WAIT      1         SET CHARS IN SWS          3A004530
0021 0 08E0           XIO       CPBSW     READ BIT SWS              3A004540
0022 0 C8E7     CPSEN LDD       CPDSV-1   LOAD LAST DSW IN Q        3A004550
0023 0 08E2           XIO       CPDSW     CHK DEVICE NOT BUSY       3A004560
0024 0 D0E6           STO       CPDSV     * OR NOT READY AND        3A004570
0025 0 1004           SLA       4         * SAVE DSW                3A004580
0026 0 4820           BSC       Z         *                         3A004590
0027 0 70FA           MDX       CPSEN     *                         3A004600
0028 0 C8E1           LDD       CPDSV-1   LOAD LAST DSW IN Q        3A004610
0029 0 08DA           XIO       CPWRT     WRITE CHARACTER           3A004620
002A 0 3003           WAIT      3         WAIT FOR INTERUPT         3A004630
002B 0 7006           MDX       CPRET     BRANCH TO DELAY           3A004640
002C 0 0000     CPIN4 DC        *-*       INTERRUPT LEVEL 4         3A004650
002D 0 08D8           XIO       CPDSW     SENSE RESET DSW           3A004660
002E 0 D0DC           STO       CPDSV     SAVE DSW                  3A004670
002F 0 C8DB           LDD       CPDSV     LOAD DSW INTO Q REG       3A004680
0030 0 4850           BOSC      -         RESET INT LEVEL           3A004690
0031 0 70FB           MDX       CPIN4&1   RESENSE DSW               3A004700
0032 0 C8D7     CPRET LDD       CPDSV-1   LOAD LAST DSW IN Q        3A004710
0033 0 C0D4           LD        CPSET     SET UP DELAY AND          3A004720
0034 0 1804           SRA       4         * EXECUTE DELAY           3A004730
0035 0 1003           SLA       3         *                         3A004740
0036 0 90CA     CPLOP S         CPONE     *                         3A004750
0037 0 4810           BSC       -         *                         3A004760
0038 0 70FD           MDX       CPLOP     *                         3A004770
0039 0 C0CC           LD        CPDSW     LD, SET UP 2ND CHAR       3A004780
003A 0 1008           SLA       8         *                         3A004790
003B 0 D0CA           STO       CPDSW     *                         3A004800
003C 0 C0CC           LD        CPCTL     CHK IF 2ND CHAR SW        3A004810
003D 0 4820           BSC       Z         * OFF                     3A004820
003E 0 70CE           MDX       CPALT     NO, BRANCH                3A004830
003F 0 68C9           STX       CPCTL     YES, SET 2ND CHAR SW      3A004840
0040 0 C0C7           LD        CPSET     CHK 1 PASS OPTION SW      3A004850
0041 0 4804           BSC       E         *                         3A004860
0042 0 70CD           MDX       CPALT&3   SW ON, GO TO WAIT 2       3A004870
0043 0 70DD           MDX       CPSEN-1   SW OFF, LOOP PROGRAM      3A004880
                ************************************************* 3A004890
0044 0 0000           DC        0         SPACE FILLER              3A004900
0045 0 0000           DC        0         *                         3A004910
0046 0 0000           DC        0         *                         3A004920
0047 0 0000           DC        0         *                         3A004930
0048 0 0000           DC        0         *                         3A004940
0049 0 0000           DC        0         *                         3A004950
004A 0 0000           DC        0         *                         3A004960
004B 0 0040           DC        /0040     THE LAST FIVE WORDS ARE   3A004970
004C 0 9000           DC        /9000     * USED FOR PROGRAM        3A004980
004D 0 2000           DC        /2000     * IDENTIFICATION. THREE   3A004990
004E 0 2000           DC        /2000     * FOR THE PID AND TWO FOR 3A005000
004F 0 0800           DC        /0800     * SEQUENCE.               3A005010
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                *************************************************** 3A005030
                *                                                   3A005040
6.03 KEYBOARD   *  1. THE PROGRAM SELECTS KEYBOARD AND DISPLAYS      3A005050
                *     THE CHARACTER READ OR THE DSW SENSED WHEN A   3A005060
                *     KEY IS DEPRESSED.                            3A005070
                *  2. THE PROGRAM ALSO CHECKS THE INTERRUPT REQUEST 3A005080
                *     KEY OPERATION.                               3A005090
                *  3. AN OPTION IS AVAILABLE TO HALT PROGRAM BEFORE 3A005100
                *     A KEY IS DEPRESSED, OR LOOP IN A SELECT      3A005110
                *     KEYBOARD AND SENSE DSW MODE.                 3A005120
                *  4. SEE PAGE 2 FOR KEYBOARD CHAR CODES.          3A005130
                *                                                   3A005140
A. PRELOAD SWS  *  NONE, SWITCHES MAY BE CHANGED AT ANY TIME.       3A005150
                *                                                   3A005160
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                3A005170
                *                                                   3A005180
C. WAITS     1  *  SET DESIRED PROGRAM OPTIONS IN BIT SWS 14 AND 15.3A005190
                *        14 ON -- DISPLAY LAST CHAR READ IN Q REG.  3A005200
                *        14 OFF - DISPLAY LAST DSW IN Q REG.        3A005210
                *        15 ON -- WAIT AFTER EACH PROGRAM PASS.     3A005220
                *        15 OFF - LOOP IN SELECT KEYBOARD AND SENSE 3A005230
                *             DSW MODE.                             3A005240
                *  DEPRESS START.                                   3A005250
                *                                                   3A005260
               2*  NORMAL PROGRAM WAIT IF BIT SW 15 IS ON. SELECT   3A005270
                *  LIGHT SHOULD BE ON.                              3A005280
                *  LAST CHAR READ AND LAST DSW ARE DISPLAYED IN     3A005290
                *  ACCUMULATOR OR Q REG, DEPENDING ON BIT SW 14.    3A005300
                *  DEPRESS DESIRED KEYBOARD KEY OR DEPRESS INT. REQ.3A005310
                *                                                   3A005320
D. RESTART      *  1. TO RESTART PROGRAM, DEPRESS IMMEDIATE STOP    3A005330
                *     AND RESET PUSH BUTTONS.                       3A005340
                *  2. DEPRESS START.                                3A005350
                *                                                   3A005360
E. COMMENTS     *  1. LAST DSW SENSED OR LAST CHARACTER READ IS     3A005370
                *     DISPLAYED IN THE Q REG. SEE WAIT 1.           3A005380
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON,    3A005390
                *     EXECUTE BIT SW 15 OFF OPTION.                 3A005400
                *                                                   3A005410
                *************************************************** 3A005420
0000                    ORG     0                                   3A005430
0000 0 6024     KYBGN   LDX     KYBLD   *A* TO /6032 LDX KYRST      3A005440
0001 0 0001     KYONE   DC      1         CONSTANT 1                3A005450
0002 0 0004     KYBSW   DC      KYDSW     BIT SW SAVE AREA          3A005460
0003 0 003A             DC      /003A   *A* TO /3A00 RD BIT SWS     3A005470
0004 0 6032     KYDSW   LDX     KYRST     RESET VECT/BIT SWS        3A005480
0005 0 F010             DC      /F010   *A* TO /0F01 XIO SENSE DSW  3A005490
0006 0 0000     KYSEL   DC      0                                   3A005500
0007 0 C000             DC      /C000   *A* TO /0C00 XIO SEL KYBD  3A005510
0008 0 000A     KYRD    DC      KYKEY     KEYED RD/IN AREA          3A005520
0009 0 A000             DC      /A000   *A* TO /0A00 XIO KEY RD     3A005530
000A 0 0000     KYKEY   DC      *-*       KEYED RD/IN AREA          3A005540
000B 0 0000     KYDSV   DC      *-*       LAST DSW SENSED           3A005550
000C 0 0011             DC      KYIN4     INTERRUPT ADDR            3A005560
000D 0 C8FC     KYDCH   LDD     KYKEY     LOAD LAST CHAR READ       3A005570
000E 0 18D0             RTE     16        SWAP LAST CHAR/DSW        3A005580
000F 0 D8FA             STD     KYKEY     *                         3A005590
0010 0 7011             MDX     KYDSP                               3A005600
0011 0 0000     KYIN4   DC      *-*       INTERRUPT ENTRY           3A005610
0012 0 08EF             XIO     KYBSW     READ BIT SWS              3A005620
0013 0 08F0             XIO     KYDSW     SENSE RESET DSW           3A005630
0014 0 D0F6             STO     KYDSV     SAVE DSW                  3A005640
0015 0 1001             SLA     1         CK IF RESPONSE            3A005650
0016 0 4850             BOSC    -         *                         3A005660
0017 0 7001             MDX     KYRFQ     NO, CHK IF REQUEST        3A005670
0018 0 7003             MDX     KYRDW     YES, READ CHAR CODE       3A005680
0019 0 1001     KYREQ   SLA     1         CHECK IF REQUEST          3A005690
001A 0 4850             BOSC    -         *                         3A005700
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001B 0 701A             MDX     KYSET     NO, RESENSE DSW           3A005710
001C 0 08EB     KYRDW   XIO     KYRD      YES, READ LAST CHAR       3A005720
001D 0 08E8             XIO     KYSEL     SELECT KEYBOARD           3A005730
001E 0 C0F5             LD      KYDSW     CK IF CHAR/DSW IN Q       3A005740
001F 0 100F             SLA     14        *                         3A005750
0020 0 4828             BSC     &Z        *                         3A005760
0021 0 70EB             MDX     KYDCH     DISPLAY CHAR IN Q         3A005770
0022 0 C8E7     KYDSP   LDD     KYKEY     DISPLAY DSW IN Q          3A005780
0023 0 7012             MDX     KYSET     GO SELECT KEYBOARD        3A005790
0024 0 C0DE     KYBLD   LD      KYBSW&1   BUILD IOCCS AND           3A005800
0025 0 1008             SLA     8         * RESET/START VECT        3A005810
0026 0 D0DC             STO     KYBSW&1   *                         3A005820
0027 0 C0DD             LD      KYDSW&1   *                         3A005830
0028 0 1804             SRA     4         *                         3A005840
0029 0 D0DB             STO     KYDSW&1   *                         3A005850
002A 0 C0DC             LD      KYSEL&1   *                         3A005860
002B 0 1804             SRA     4         *                         3A005870
002C 0 D0DA             STO     KYSEL&1   *                         3A005880
002D 0 C0D8             LD      KYRD&1    *                         3A005890
002E 0 1804             SRA     4         *                         3A005900
002F 0 D0D9             STO     KYRD&1    *                         3A005910
0030 0 C0D3             LD      KYDSW     *                         3A005920
0031 0 D0CE             STO     KYBGN     *                         3A005930
0032 0 3001     KYRST   WAIT    1         SET PROGRAM OPTIONS       3A005940
0033 0 08D2             XIO     KYSEL     SELECT KEYBOARD           3A005950
0034 0 1010             SLA     16        CL LAST CHAR KEYED        3A005960
0035 0 D0D4             STO     KYKEY     *                         3A005970
0036 0 08CB     KYSET   XIO     KYBSW     RD BIT SWS FOR OPTS       3A005980
0037 0 C0CC             LD      KYDSW     CHK IF SEL/RD LOOP        3A005990
0038 0 100F             SLA     15        *                         3A006000
0039 0 4810             BSC     -         * OPTION IS SELECTED      3A006010
003A 0 70D7             MDX     KYIN4&1   YES, GO SENSE DSW         3A006020
003B 0 C8CE             LDD     KYKEY     DISPLAY CHAR/DSW IN Q     3A006030
003C 0 3002             WAIT    2         DEPRESS DESIRED KEY       3A006040
003D 0 70D4             MDX     KYIN4&1   GO SENSE DSW              3A006050
                ************************************************** 3A006060
003E 0 0000             DC      0         SPACE FILLER              3A006070
003F 0 0000             DC      0         *                         3A006080
0040 0 0000             DC      0         *                         3A006090
0041 0 0000             DC      0         *                         3A006100
0042 0 0000             DC      0         *                         3A006110
0043 0 0000             DC      0         *                         3A006120
0044 0 0000             DC      0         *                         3A006130
0045 0 0000             DC      0         *                         3A006140
0046 0 0000             DC      0         *                         3A006150
0047 0 0000             DC      0         *                         3A006160
0048 0 0000             DC      0         *                         3A006170
0049 0 0000             DC      0         *                         3A006180
004A 0 0000             DC      0         *                         3A006190
004B 0 0040             DC      /0040     THE LAST FIVE WORDS ARE   3A006200
004C 0 9000             DC      /9000     * USED FOR PROGRAM        3A006210
004D 0 2000             DC      /2000     * IDENTIFICATION. THREE   3A006220
004E 0 2000             DC      /2000     * FOR THE PID AND TWO FOR 3A006230
004F 0 0040             DC      /0040     * SEQUENCE.               3A006240
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                *************************************************** 3A006260
                *                                                   3A006270
6.04 PAPER TAPE *  1. THE PROGRAM PUNCHES ALTERNATE CHARACTERS      3A006280
     PUNCH      *     WHICH HAS BEEN SELECTED IN THE BIT SWS,       3A006290
                *     OR A BINARY PATTERN.                          3A006300
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE   3A006310
                *     DELAY BETWEEN XIO PUNCH EXECUTIONS.           3A006320
                *  3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM    3A006330
                *     AFTER THE COMPLETION OF THE EXECUTION OF      3A006340
                *     A PROGRAM PASS.                               3A006350
                *  4. SEE PAGE 2A FOR BIT SW CONTROL BINARY PATTERN.3A006360
                *  5. THIS TAPE MAY BE USED IN THE PAPER TAPE       3A006370
                *     READER SCOPE LOOP, 6.05.                      3A006380
                *                                                   3A006390
A. PRELOAD SWS  *  1. IF DELAY IS DESIRED, SET DELAY CONTROL        3A006400
                *     VALUE IN BIT SWITCHES 1 THRU 13.              3A006410
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.       3A006420
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.       3A006430
                *  2. IF A BINARY PATTERN IS DESIRED, TURN ON       3A006440
                *     BIT SWITCH 14.                                3A006450
                *  3. IF A WAIT AFTER EACH PROGRAM PASS IS          3A006460
                *     DESIRED, TURN ON BIT SWITCH 15.               3A006470
                *                                                   3A006480
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                3A006490
                *                                                   3A006500
C. WAITS     1  *  SET DESIRED CHARACTERS TO BE PUNCHED IN BIT SWS   3A006510
                *  0 THRU 15. SEE PAGE    FOR BIT SW CODES.         3A006520
                *        1ST CHARACTER IN SWS 0 THRU 7.             3A006530
                *        2ND CHARACTER IN SWS 8 THRU 15.            3A006540
                *  MAKE PAPER TAPE PUNCH READY.                     3A006550
                *  DEPRESS START.                                   3A006560
                *                                                   3A006570
             2  *  NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN    3A006580
                *  SELECTED. DEPRESS START TO MAKE ANOTHER PASS.    3A006590
                *                                                   3A006600
             3  *  NO INTERRUPT GENERATED AFTER XIO PUNCH           3A006610
                *  COMMAND WAS GIVEN. SEE COMMENTS.                 3A006620
                *                                                   3A006630
D. RESTART      *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD    3A006640
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE            3A006650
                *     STOP AND RESET PUSH BUTTONS.                  3A006660
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.      3A006670
                *  3. DEPRESS START.                                3A006680
                *                                                   3A006690
E. COMMENTS     *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.     3A006700
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON      3A006710
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /6034   3A006720
                *     INTO LOCATION /0031 AND DO A PROGRAM RESTART. 3A006730
                *  3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6034     3A006740
                *     INTO LOCATION /0031 AND LOAD /603A INTO       3A006750
                *     LOCATION /0039 AND DO A PROGRAM RESTART.      3A006760
                *                                                   3A006770
                *************************************************** 3A006780
0000                    ORG     0                                   3A006790
0000 0 600D     TPBGN LDX       TPBLD   *A* TO LDX TPRDS /6024      3A006800
0001 0 0001     TPONE DC        1          CONSTANT ONE             3A006810
0002 0 0006     TPBSW DC        TPDSW      BIT SW SAVE AREA         3A006820
0003 0 003A           DC        /003A   *A* TO /3A00 RD BIT SWS     3A006830
0004 0 0006     TPWRT DC        TPDSW      CHARACTER ADDRESS        3A006840
0005 0 0019           DC        /0019   *A* TO /1900 XIO PUNCH     3A006850
0006 0 0000     TPDSW DC        *-*        BIT SW READIN AREA       3A006860
0007 0 001F           DC        /001F   *A* TO /1F01 SENSE DSW      3A006870
0008 0 0000     TPSET DC        *-*        SW OPTION/DELAY SAVE     3A006880
0009 0 601C     TPCTL LDX       TPRDS      2ND CHAR SW/RESET MOD    3A006890
000A 0 0000     TP100 DC        *-*     *A* TO /0100 PATT BUILD     3A006900
000B 0 0000     TPDSV DC        *-*        DSW SAVE AREA            3A006910
000C 0 0033           DC        TPIN4      INTERRUPT ADDRESS        3A006920
000D 0 C0F7     TPBLD LD        TPWRT&1    BUILD WRITE IOCC         3A006930
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000E 0 1008             SLA     8          *                        3A006940
000F 0 D0F5             STO     TPWRT&1    *                        3A006950
0010 0 C0F6             LD      TPDSW&1    BUILD SENSE RESET        3A006960
0011 0 1008             SLA     8          *                        3A006970
0012 0 E8EE             OR      TPONE      *                        3A006980
0013 0 D0F3             STO     TPDSW&1    *                        3A006990
0014 0 C0EE             LD      TPBSW&1    BUILD READ BIT SW        3A007000
0015 0 1008             SLA     8          * IOCC                   3A007010
0016 0 D0EC             STO     TPBSW&1    *                        3A007020
0017 0 C0E9             LD      TPONE      BUILD PATTERN WORD       3A007030
0018 0 1008             SLA     8          *                        3A007040
0019 0 D0F0             STO     TP100      *                        3A007050
001A 0 C0EE             LD      TPCTL      SET UP RESET AND         3A007060
001B 0 D0E4             STO     TPBGN      * START BRANCH           3A007070
001C 0 08E5     TPRDS XIO       TPBSW      READ BIT SWS FOR         3A007080
001D 0 C0E8             LD      TPDSW      * PROG OPTS/DELAY        3A007090
001E 0 D0E9             STO     TPSET      *                        3A007100
001F 0 3001             WAIT    1          SET CHARS IN SWS         3A007110
0020 0 1010             SLA     16         CLR PUNCH WD LOC         3A007120
0021 0 D0E4             STO     TPDSW                               3A007130
0022 0 C0E5             LD      TPSET      CHK PUNCH OPTION         3A007140
0023 0 100E             SLA     14         *                        3A007150
0024 0 4828             BSC     &Z         *                        3A007160
0025 0 7002             MDX     TPPAT      BIT 14 ON, PCH PATT      3A007170
0026 0 08DB             XIO     TPBSW      READ BIT SWS             3A007180
0027 0 7005             MDX     TPSEN      GO SENSE DSW             3A007190
0028 0 C0DD     TPPAT LD        TPDSW      LOAD PATTERN WORD        3A007200
0029 0 80E0             A       TP100      BUILD NEXT WORD          3A007210
002A 0 D0DB             STO     TPDSW      *                        3A007220
002B 0 1010     TPALT SLA       16         CLR 2ND CHAR SW          3A007230
002C 0 D0DC             STO     TPCTL      *                        3A007240
002D 0 08D8     TPSEN XIO       TPDSW      SENSE DSW                3A007250
002E 0 D0DC             STO     TPDSV      SAVE DSW                 3A007260
002F 0 C8DA             LDD     TPDSV-1    LOAD LAST DSW IN Q       3A007270
0030 0 08D3             XIO     TPWRT      PUNCH CHARACTER          3A007280
0031 0 3003             WAIT    3          WAIT FOR INTERUPT        3A007290
0032 0 7007             MDX     TPRET      BRANCH TO DELAY          3A007300
0033 0 0000     TPIN4 DC        *-*        INTERRUPT LEVEL 4        3A007310
0034 0 C8D5             LDD     TPDSV-1    LOAD LAST DSW INTO Q     3A007320
0035 0 08D0             XIO     TPDSW      SENSE RESET DSW          3A007330
0036 0 D0D4             STO     TPDSV      SAVE DSW                 3A007340
0037 0 1003             SLA     3          CK IF PUNCH RESPONSE     3A007350
0038 0 4850             BOSC    -          RESET INT LEVEL          3A007360
0039 0 70FA             MDX     TPIN4&1    RESENSE DSW              3A007370
003A 0 C0CD     TPRET LD        TPSET      SET UP DELAY AND         3A007380
003B 0 1801             SRA     1          * EXECUTE DELAY          3A007390
003C 0 90C4     TPLOP S         TPONE      *                        3A007400
003D 0 4810             BSC     -          *                        3A007410
003E 0 70FD             MDX     TPLOP      *                        3A007420
003F 0 C0C9             LD      TPCTL      CHK IF 2ND CHAR SW       3A007430
0040 0 4818             BSC     &-         * CLEARED                3A007440
0041 0 7004             MDX     TPNOT      YES                      3A007450
0042 0 C0C3             LD      TPDSW      NO, SET UP 2ND CHAR      3A007460
0043 0 1008             SLA     8          *                        3A007470
0044 0 D0C1             STO     TPDSW      *                        3A007480
0045 0 70E5             MDX     TPALT      PUNCH 2ND CHAR           3A007490
0046 0 68C2     TPNOT STX       TPCTL      SET 2ND CHAR SW          3A007500
0047 0 C0C0             LD      TPSET      CHK 1 PASS OPTION SW     3A007510
0048 0 4804             BSC     E          *                        3A007520
0049 0 3002             WAIT    2          COMPLETED PROG PASS      3A007530
004A 0 70D7             MDX     TPRDS&6    LOOP PROGRAM             3A007540
                ************************************************** 3A007550
004B 0 0040             DC      /0040      THE LAST FIVE WORDS ARE  3A007560
004C 0 9000             DC      /9000      * USED FOR PROGRAM       3A007570
004D 0 2000             DC      /2000      * IDENTIFICATION. THREE  3A007580
004E 0 2000             DC      /2000      * FOR THE PID AND TWO FOR 3A007590
004F 0 0020             DC      /0020      * SEQUENCE.              3A007600
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                *************************************************** 3A007620
6.05 PAPER TAPE *  1. THE PROGRAM READS CHARACTERS WHICH HAVE BEEN   3A007630
     READER     *     PUNCHED IN THE TAPE AND COMPARES THEM WITH     3A007640
                *     A BINARY PATTERN OR ALTERNATE BIT SWITCH       3A007650
                *     CHARACTERS.                                    3A007660
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE    3A007670
                *     DELAY BETWEEN XIO READ EXECUTIONS.             3A007680
                *  3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6        3A007690
                *     ON COMPARE ERRORS.                             3A007700
                *                                                    3A007710
A. PRELOAD SWS  *  1. IF DELAY IS DESIRED, SET DELAY CONTROL        3A007720
                *     VALUE IN BIT SWITCHES 1 THRU 13.               3A007730
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.        3A007740
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.        3A007750
                *  2. IF A BINARY PATTERN IS DESIRED, TURN ON        3A007760
                *     BIT SWITCH 14.                                 3A007770
                *  3. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS       3A007780
                *     DESIRED, TURN ON BIT SWITCH 15.                3A007790
                *                                                    3A007800
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                 3A007810
                *                                                    3A007820
C. WAITS     1  *  LOAD PAPER TAPE INTO READER. SEE PAGE 2A FOR     3A007830
                *  LOADING A BINARY PATTERN TAPE.                    3A007840
                *  PLACE 1ST CHARACTER TO BE READ FROM THE TAPE,     3A007850
                *  JUST BEHIND SENSING PINS.                         3A007860
                *  SET DESIRED CHARACTERS TO COMPARE IN BIT SWS      3A007870
                *  0 THRU 15. SEE PAGE 2A FOR BIT SW CODES.          3A007880
                *        1ST CHARACTER IN SWS 0 THRU 7.              3A007890
                *        2ND CHARACTER IN SWS 8 THRU 15.             3A007900
                *  DEPRESS START.                                    3A007910
                *                                                    3A007920
             5  *  NO INTERRUPT GENERATED AFTER XIO TAPE ADVANCE     3A007930
                *  COMMAND WAS GIVEN. SEE COMMENTS.                  3A007940
                *                                                    3A007950
             6  *  COMPARE ERROR. ACCUMULATOR CONTAINS THE CHAR      3A007960
                *  READ. THIS CHARACTER IS NOW LOCATED 1 CHARACTER   3A007970
                *  PAST THE SENSING PINS.                            3A007980
                *  TO READ/COMPARE NEXT CHARACTER, DEPRESS START.    3A007990
                *  TO LOOP ON COMPARE ERROR, SEE PRELOAD SWS.        3A008000
                *                                                    3A008010
D. RESTART      *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD    3A008020
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE             3A008030
                *     STOP AND RESET PUSH BUTTONS.                   3A008040
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.       3A008050
                *  3. DEPRESS START.                                 3A008060
                *                                                    3A008070
E. COMMENTS     *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.     3A008080
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON      3A008090
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /6002    3A008100
                *     INTO LOCATION /0042 AND DO A PROGRAM RESTART.  3A008110
                *  3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6002      3A008120
                *     INTO LOCATION /0042 AND LOAD /601A INTO        3A008130
                *     LOCATION /0006 AND DO A PROGRAM RESTART.       3A008140
0000                    ORG     0                                   3A008150
0000 0 6021     TRBGN   LDX     TRBLD   *A* TO /602F LDX TRRST      3A008160
0001 0 602F     TRIN4   LDX     TRRST     INTERRUPT ENTRY           3A008170
0002 0 0809             XIO     TRDSW     SENSE DSW                 3A008180
0003 0 D021             STO     TRDSV     SAVE DSW                  3A008190
0004 0 1001             SLA     1         CK FOR OP COMPLETE        3A008200
0005 0 4850             BOSC    -         *                         3A008210
0006 0 70FB             MDX     TRIN4&1   NO, RESENSE DSW           3A008220
0007 0 0806             XIO     TRRD      YES, READ TAPE            3A008230
0008 0 C01B             LD      TRARA     COMPARE TO EXPECTED       3A008240
0009 0 7008             MDX     TRI4A     GO TO TRI4A               3A008250
000A 0 D000     TRADV   DC      /D000     BUILD CONSTANT            3A008260
000B 0 E000             DC      /E000   *A* TO /1C00 XIO ADVANCE    3A008270
000C 0 0001     TRDSW   DC      /0001     INT ADR/CONSTANT 1        3A008280
000D 0 F808             DC      /F808   *A* TO /1F01 XIO SENSE      3A008290
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000E 0 0024     TRRD    DC      TRARA     READ/IN ADDR              3A008300
000F 0 001A             DC      /001A   *A* TO /1A00 XIO READ       3A008310
0010 0 0023     TRBSW   DC      TRSBW     BIT SW SAVE ADDR          3A008320
0011 0 003A             DC      /003A   *A* TO /3A00 RD BIT SWS     3A008330
0012 0 F010     TRI4A   FOR     TRSBW     *                         3A008340
0013 0 4818             BSC     &-        *                         3A008350
0014 0 7005             MDX     TRLOP-3   OK, GO TO DELAY           3A008360
0015 0 C00B             LD      TRBLD     ERR, CK LOOP/ERR OPT      3A008370
0016 0 4804             BSC     E         *                         3A008380
0017 0 7002             MDX     TRLOP-3   LOOP/ERR SELECTED         3A008390
0018 0 C80B             LDD     TRARA     LD WD READ AND DSW        3A008400
0019 0 3006             WAIT    6         COMPARE ERROR WAIT        3A008410
001A 0 C809             LDD     TRARA     LOAD DSW INTO Q           3A008420
001B 0 C005             LD      TRBLD     SET UP DELAY              3A008430
001C 0 1801             SRA     1         *                         3A008440
001D 0 90EE     TRLOP   S       TRDSW     *                         3A008450
001E 0 4810             BSC     -         *                         3A008460
001F 0 70FD             MDX     TRLOP     *                         3A008470
0020 0 7014             MDX     TRSTR     CK ON PATT OPT            3A008480
0021 0 C0EF     TRBLD   LD      TRBSW&1   BUILD PROGRAM             3A008490
0022 0 1008     TR100   SLA     8       *A* TO /0100 PATT, BUILD    3A008500
0023 0 D0ED     TRSBW   STO     TRBSW&1 *A* TO *-* COMP S/B WORD     3A008510
0024 0 C0E8     TRARA   LD      TRDSW&1 *A* TO *-* WORD READ         3A008520
0025 0 1803     TRDSV   SRA     3       *A* TO *-* SAVED DSW         3A008530
0026 0 D0E6     TRCTL   STO     TRDSW&1 *A* TO *-* ALT CHAR SW       3A008540
0027 0 1008             SLA     8         *                         3A008550
0028 0 D0F9             STO     TR100     *                         3A008560
0029 0 C8E0             LDD     TRADV     *                         3A008570
002A 0 18C3             RTE     3         *                         3A008580
002B 0 D0E3             STO     TRRD&1    *                         3A008590
002C 0 D8DD             STD     TRADV     *                         3A008600
002D 0 C0D3             LD      TRIN4     *                         3A008610
002E 0 D0D1             STO     TRBGN     *                         3A008620
002F 0 08E0     TRRST   XIO     TRBSW     RD SWS DELAY/OPTIONS      3A008630
0030 0 C0F2             LD      TRSBW     SAVE DELAY/OPTIONS        3A008640
0031 0 D0EF             STO     TRBLD     *                         3A008650
0032 0 3001             WAIT    1         SET CHARACTERS IN SWS     3A008660
0033 0 1010             SLA     16        INITIALIZE S/B WD         3A008670
0034 0 D0EE             STO     TRSBW     *                         3A008680
0035 0 C0EB     TRSTR   LD      TRBLD     CK WHICH PATT OPTION      3A008690
0036 0 100E             SLA     14        *                         3A008700
0037 0 4828             BSC     &Z        *                         3A008710
0038 0 700F             MDX     TRPAT     BINARY PATT SELECTED      3A008720
0039 0 08D6             XIO     TRBSW     READ BIT SWS-CHARS        3A008730
003A 0 C0EB             LD      TRCTL     CK WHICH CHAR             3A008740
003B 0 4820             BSC     Z         *                         3A008750
003C 0 7006             MDX     TRNOT     SEL LEFT CHAR             3A008760
003D 0 68E8             STX     TRCTL     SET ALT CHAR SW           3A008770
003E 0 C0E4             LD      TRSBW     LOAD BIT SWS              3A008780
003F 0 1008     TRALT   SLA     8         SET UP RIGHT CHAR         3A008790
0040 0 D0E2             STO     TRSBW     SAVE IN S/B               3A008800
0041 0 08C8             XIO     TRADV     ADVANCE TAPE              3A008810
0042 0 3005             WAIT    5         WAIT FOR INTERRUPT        3A008820
0043 0 1010     TRNOT   SLA     16        CL ALT CHAR SW            3A008830
0044 0 D0E1             STO     TRCTL     *                         3A008840
0045 0 C0DD             LD      TRSBW     SET UP RIGHT CHAR         3A008850
0046 0 1808             SRA     8         *                         3A008860
0047 0 70F7             MDX     TRALT     *                         3A008870
0048 0 C0DA     TRPAT   LD      TRSBW     SET UP BINARY PATT        3A008880
0049 0 80D8             A       TR100     *                         3A008890
004A 0 70F5             MDX     TRALT&1   *                         3A008900
                ******************************************************* 3A008910
004B 0 0040             DC      /0040     THE LAST FIVE WORDS ARE   3A008920
004C 0 9000             DC      /9000     * USED FOR PROGRAM        3A008930
004D 0 2000             DC      /2000     * IDENTIFICATION. THREE   3A008940
004E 0 2000             DC      /2000     * FOR THE PID AND TWO FOR 3A008950
004F 0 0010             DC      /0010     * SEQUENCE.               3A008960
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                        ************************************************** 3A008980
                        *                                                3A008990
6.06 1442 PUNCH         *  THIS PROGRAM WILL PUNCH THE DATA IN BIT SWITCHES 3A009000
                        *  0-11 IN ALL COLUMN UNLESS BIT 12 IS ON AND THEN 3A009010
                        *  ONLY THE FIRST COLUMN IS PUNCHED. THESE CARDS   3A009020
                        *  MAY BE USED IN THE READER SCOPE LOOP 6.07 AND   3A009030
                        *  6.11.                                           3A009040
                        *                                                  3A009050
    A. PRELOAD SWS      *  NONE, SWITCHES MAY BE SET AT ANY TIME.          3A009060
                        *                                                  3A009070
    B. LOADING          *  IPL MODE FROM CARDS OR PAPER TAPE.              3A009080
                        *                                                  3A009090
    C. WAIT       1     *  SET DESIRED BIT SWITCHES AS FOLLOWS,            3A009100
                        *                        BIT 15- HALT              3A009110
                        *                        BIT 14- STACKER SELECT    3A009120
                        *                        BIT 13- FEED A CARD       3A009130
                        *                        BIT 12- TERMINATE PUNCHING 3A009140
                        *                      0 TO 11- PUNCHING PATTERN   3A009150
                        *                                                  3A009160
                  2     *  ONE PASS COMPLETED, PRESS START TO CONTINUE.    3A009170
                        *                                                  3A009180
                  3     *  LOST PUNCH INTERRUPT.                           3A009190
                        *                                                  3A009200
                  5     *  LOST FEED OR INTIATE PUNCH INTERRUPT.           3A009210
                        *                                                  3A009220
    D. RESTART          *  PRESS IMMEDIATE STOP AND RESET. PRELOADING      3A009230
                        *  SWITCHES MAY BE SET AS DESIRED. PRESS START.    3A009240
                        *                                                  3A009250
    E. COMMENTS         *  1. TO RUN THE PROG WITH INTERRUPT DELAY SWITCH  3A009260
                        *     ON OR BYPASS THE INTERRUPT WAIT LOAD /6012   3A009270
                        *     INTO LOCATION /0021 AND /0032 AND RESTART.   3A009280
                        *                                                  3A009290
                        *  2. TO GET A FASTER LOOP THAN THE ABOVE PLACE    3A009300
                        *     /70FF IN THE NEXT LOCATION AFTER THE XIO. THE 3A009310
                        *     XIO WILL BE EXECUTED AFTER EACH BRANCH.      3A009320
                        *                                                  3A009330
                        ************************************************** 3A009340
0000                            ORG   0                                   3A009350
0000 0 6037             PHFED   LDX   PHBLD   *A* TO /600F  LDX   PH1      3A009360
0001 0 0003                     DC    /0003   *A* DC     /1402 FD A CD      3A009370
0002 0 0000             PHCTR   DC    *-*       COLUMN COUNTER             3A009380
0003 0 0000             PHSWS   DC    *-*       BIT SWITCH STG             3A009390
0004 0 0003             PHBSW   DC    /0003     READ IN ADRS               3A009400
0005 0 003A                     DC    /003A   *A* DC     /3A00              3A009410
0006 0 0003             PHPCH   DC    PHSWS     PCH I/O AREA               3A009420
0007 0 0011                     DC    /0011   *A* DC     /1100              3A009430
0008 0 0011             PHPST   DC    PHINT     COL INTR ADRS              3A009440
0009 0 A008                     DC    /A008   *A* DC     /1401              3A009450
000A 0 0008             PHDSW   DC    /0008     PCH TERMINATOR             3A009460
000B 0 B818                     DC    /B818   *A* DC     /1703              3A009470
000C 0 0011             PHSTK   DC    PHINT     OP COMP INTR ADRS          3A009480
000D 0 0029                     DC    /0029   *A* DC     /1480              3A009490
000E 0 00F0             PHK50   DC    /00F0     80 COLS TIMES 3            3A009500
000F 0 3001             PH1     WAIT  1         SET BIT SWS                3A009510
0010 0 701F                     MDX   PH2                                  3A009520
0011 0 0000             PHINT   DC    *-*       INTERREPT ENTRY            3A009530
0012 0 08F7                     XIO   PHDSW     SENSE DSW                  3A009540
0013 0 1001                     SLA   1                                    3A009550
0014 0 4850                     BOSC  -         COL INTR ON                3A009560
0015 0 700C                     MDX   PH6       * NO, TRY OP COMP          3A009570
0016 0 08ED                     XIO   PHBSW                                3A009580
0017 0 C0EA                     LD    PHCTR     COLUMN COUNTER             3A009590
0018 0 80EB                     A     PHBSW     ADD THREE                  3A009600
0019 0 D0E8                     STO   PHCTR                                3A009610
001A 0 F0F3                     EOR   PHK50     CHECK FOR LAST COLUMN      3A009620
001B 0 4820                     BSC   Z         IS IT LAST COLUMN          3A009630
001C 0 7003                     MDX   PH4                                  3A009640
001D 0 C0E5                     LD    PHSWS     GET DATA TO BE PUNCHED     3A009650
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001E 0 E8EB                     OR    PHDSW     * AND OR IN PCH TERM       3A009660
001F 0 D0E3                     STO   PHSWS     * ANS STORE BACK           3A009670
0020 0 08E5             PH4     XIO   PHPCH     PUNCH A COLUMN             3A009680
0021 0 3003                     WAIT  3         WAIT FOR INTERRUPT         3A009690
0022 0 1003             PH6     SLA   3                                    3A009700
0023 0 4850                     BOSC  -         OP COMP ON                 3A009710
0024 0 6012                     LDX   PHINT&1   * NO, SENSE AGAIN           3A009720
0025 0 1010                     SLA   16        * LEVEL 4- OP COMP         3A009730
0026 0 D0DB                     STO   PHCTR     CLEAR COLUMN COUNTER       3A009740
0027 0 08DC                     XIO   PHBSW     READ BIT SWITCHES          3A009750
0028 0 C0DA                     LD    PHSWS     GET SW SETTING             3A009760
0029 0 4804                     BSC   E         HALT PROGRAM               3A009770
002A 0 3002                     WAIT  2         * YES                      3A009780
002B 0 1801                     SRA   1         * NO                       3A009790
002C 0 4804                     BSC   E         DO STACKER SELECT          3A009800
002D 0 7005                     MDX   PH8       * YES                      3A009810
002E 0 1801                     SRA   1         * NO                       3A009820
002F 0 4804                     BSC   E         WHAT OPERATION             3A009830
0030 0 08CF             PH2     XIO   PHFED     FEED A CARD                3A009840
0031 0 08D6                     XIO   PHPST     START THE PUNCH            3A009850
0032 0 3005                     WAIT  5         * PCH FROM SWS             3A009860
0033 0 08D8             PH8     XIO   PHSTK     GIVE STACKER COMMAND       3A009870
0034 0 C0CE                     LD    PHSWS     RESTORE ACC                3A009880
0035 0 1802                     SRA   2                                    3A009890
0036 0 70F8                     MDX   PH2-1                                3A009900
                        *                       BUILD XIO COMMANDS         3A009910
0037 0 C012             PHBLD   LD    PHRES     SET UP RESTART             3A009920
0038 0 D0C7                     STO   0                                    3A009930
0039 0 C0CF                     LD    PHPST+1   * INIT PCH                 3A009940
003A 0 1803                     SRA   3         *                          3A009950
003B 0 D0CD                     STO   PHPST+1   *                          3A009960
003C 0 F0C4                     EOR   PHFED&1   * FEED A CARD              3A009970
003D 0 D0C3                     STO   PHFED&1   *                          3A009980
003E 0 C0C6                     LD    PHBSW+1   * READ BIT SWITCHES        3A009990
003F 0 1008                     SLA   8         *                          3A010000
0040 0 D0C4                     STO   PHBSW+1   *                          3A010010
0041 0 C0C9                     LD    PHDSW+1   * SENSE DSW                3A010020
0042 0 1803                     SRA   3         *                          3A010030
0043 0 D0C7                     STO   PHDSW+1   *                          3A010040
0044 0 C0C2                     LD    PHPCH+1   * PCH A COLUMN             3A010050
0045 0 1008                     SLA   8         *                          3A010060
0046 0 D0C0                     STO   PHPCH+1   *                          3A010070
0047 0 C0C5                     LD    PHSTK+1   * STACK SELECT             3A010080
0048 0 1007                     SLA   7         *                          3A010090
0049 0 D0C3                     STO   PHSTK&1   *                          3A010100
004A 0 600F             PHRES   LDX   PH1                                  3A010110
                        ************************************************** 3A010120
004B 0 0040                     DC    /0040     THE LAST FIVE WORDS ARE    3A010130
004C 0 9000                     DC    /9000     * USED FOR PROGRAM         3A010140
004D 0 2000                     DC    /2000     * IDENTIFICATION. THREE    3A010150
004E 0 2000                     DC    /2000.    * FOR THE PID AND TWO FOR  3A010160
004F 0 0008                     DC    /0008     * SEQUENCE.                3A010170
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                *****************************************************  3A010190
                *                                                   *  3A010200
6.07 1442 READER*  1. THE PROGRAM READS A COLUMN OF DATA FROM        *  3A010210
                *     THE CARD AND COMPARES IT WITH THE BIT SWS.     *  3A010220
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE    *  3A010230
                *     DELAY BETWEEN XIO READ EXECUTIONS.             *  3A010240
                *  3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6        *  3A010250
                *     ON COMPARE ERRORS.                             *  3A010260
                *                                                   *  3A010270
A. PRELOAD SWS  *  1. IF DELAY IS DESIRED, SET DELAY CONTROL        *  3A010280
                *     VALUE IN BIT SWITCHES 1 THRU 13.              *  3A010290
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.       *  3A010300
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.       *  3A010310
                *  2. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS       *  3A010320
                *     DESIRED, TURN ON BIT SWITCH 15.               *  3A010330
                *                                                   *  3A010340
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                *  3A010350
                *                                                   *  3A010360
C. WAITS     1  *  SET BIT SWITCHES 0 THRU 11 TO EXPECTED COLUMN    *  3A010370
                *  DATA AND SET BITS 12 THRU 15 OFF.                *  3A010380
                *  LOAD PREPUNCHED CARDS INTO READER AND MAKE RDY.  *  3A010390
                *  DEPRESS START.                                   *  3A010400
                *                                                   *  3A010410
             4  *  NO INTERRUPT GENERATED AFTER XIO READ.           *  3A010420
                *  COMMAND WAS GIVEN. SEE COMMENTS.                 *  3A010430
                *                                                   *  3A010440
             6  *  COMPARE ERROR. ACCUMULATOR CONTAINS BITS READ.   *  3A010450
                *  IF ACCUMULATOR CONTAINS /00FF, COLUMN READ WAS   *  3A010460
                *  NOT STORED INTO READ/IN AREA.                    *  3A010470
                *  DEPRESS START TO READ NEXT CARD.                 *  3A010480
                *  TO BYPASS COMPARE ERROR WAIT, SEE PRELOAD.       *  3A010490
                *                                                   *  3A010500
D. RESTART      *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD   *  3A010510
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE            *  3A010520
                *     STOP AND RESET PUSH BUTTONS.                  *  3A010530
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.      *  3A010540
                *  3. DEPRESS START.                                *  3A010550
                *                                                   *  3A010560
E. COMMENTS     *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.    *  3A010570
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON     *  3A010580
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /6010   *  3A010590
                *     INTO LOCATION /0037 AND DO A PROGRAM RESTART. *  3A010600
                *  3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6010     *  3A010610
                *     INTO LOCATION /0037 AND LOAD /1000 INTO       *  3A010620
                *     LOCATION /003A AND DO A PROGRAM RESTART.      *  3A010630
                *                                                   *  3A010640
                *****************************************************  3A010650
0000                    ORG     0                                      3A010660
0000 0 601F     RDBGN LDX       RDBLD   *A* TO /602D LDX RDRST         3A010670
0001 0 00FF     RDARA DC        /00FF      READ IN AREA                3A010680
0002 0 0006     RDBSW DC        RDDSW      BIT SW SAVE AREA            3A010690
0003 0 003A             DC      /003A   *A* TO /3A00 RD BIT WSW        3A010700
0004 0 0001     RDRRD DC        RDARA      READ IN AREA ADDR           3A010710
0005 0 0012             DC      /0012   *A* TO /1200 XIO READ          3A010720
0006 0 602D     RDDSW LDX       RDRST      BIT SW SAVE AREA            3A010730
0007 0 8818             DC      /8818   *A* TO /1703 XIO SENSE         3A010740
0008 0 000F     RDRGO DC        RDI04      INTERRUPT ADDR              3A010750
0009 0 2808             DC      /2808   *A* TO /1404 XIO START         3A010760
000A 0 0000     RDERR DC        *-*        LAST RDR COMPARE ERR        3A010770
000B 0 0000     RDDSV DC        *-*        LAST DSW SENSED             3A010780
000C 0 000F             DC      RDI04      INTERRUPT ADDR              3A010790
000D 0 00FF     RDOFF DC        /00FF      CONSTANT /00FF              3A010800
000E 0 0001     RDONE DC        1          CONSTANT 1                  3A010810
000F 0 0000     RDI04 DC        *-*        INTERRUPT ENTRY             3A010820
0010 0 08F5             XIO     RDDSW      SENSE AND SAVE DSW          3A010830
0011 0 00F9             STO     RDDSV      *                           3A010840
0012 0 4850             BOSC    -          CK FOR RD RESPONSE          3A010850
0013 0 7024             MDX     RDCOP      NO, CK OP COMPLETE          3A010860
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0014 0 08FF             XIO     RDRRD      YES, READ COLUMN            3A010870
0015 0 C0F0             LD      RDDSW      CK IF COMPARE TO SWS        3A010880
0016 0 1804             SRA     4          *                           3A010890
0017 0 1004             SLA     4          *                           3A010900
0018 0 F0E8             EOR     RDARA      *                           3A010910
0019 0 4818             BSC     &-         *                           3A010920
001A 0 701C             MDX     RDINT      YES, WAIT NXT INTRPT        3A010930
001B 0 C0E5             LD      RDARA      NO,SAVE COL READ            3A010940
001C 0 D0ED             STO     RDERR      *                           3A010950
001D 0 6802             STX     RDESW      SET ERR SW                  3A010960
001F 0 7018             MDX     RDINT      WAIT FOR NXT INTRPT         3A010970
001F 0 C0E3     RDBLD   LD      RDBSW&1    BUILD IOCCS AND             3A010980
0020 0 1008     RDESW   SLA     8          * RESET/START BRANCH        3A010990
0021 0 D0E1             STO     RDBSW&1    *                           3A011000
0022 0 C0E4             LD      RDDSW&1    *                           3A011010
0023 0 1803             SRA     3          *                           3A011020
0024 0 D0E2             STO     RDDSW&1    *                           3A011030
0025 0 C0F3             LD      RDRGO&1    *                           3A011040
0026 0 1801             SRA     1          *                           3A011050
0027 0 D0E1             STO     RDRGO&1    *                           3A011060
0028 0 C0DC             LD      RDRRD&1    *                           3A011070
0029 0 1008             SLA     8          *                           3A011080
002A 0 D0DA             STO     RDRRD&1    *                           3A011090
002B 0 C0DA             LD      RDDSW      *                           3A011100
002C 0 D0D3             STO     RDBGN      *                           3A011110
002D 0 08D4     RDRST   XIO     RDBSW      READ SWS DELAY/OPT          3A011120
002E 0 C0D7             LD      RDDSW      * SAVE DELAY/OPTION         3A011130
002F 0 D0EF             STO     RDBLD      *                           3A011140
0030 0 3001             WAIT    1          SET READ PATTERN            3A011150
0031 0 C0DB             LD      RDOFF      *                           3A011160
0032 0 D0CE             STO     RDARA      *                           3A011170
0033 0 1010             SLA     16         INITIALIZE AND READ         3A011180
0034 0 D0EB             STO     RDESW      * BIT SWS                   3A011190
0035 0 08CC             XIO     RDBSW      *                           3A011200
0036 0 08D1             XIO     RDRGO      START READER                3A011210
0037 0 3004     RDINT   WAIT    4          WAIT FOR INTERRUPT          3A011220
0038 0 1004     RDCOP   SLA     4          CK FOR OP COMPLETE          3A011230
0039 0 4850             BOSC    -          *                           3A011240
003A 0 70D5             MDX     RDI04&1    NO, RESENSE DSW             3A011250
003B 0 C8CE             LDD     RDDSV-1    YES, LOAD DSW IN Q          3A011260
003C 0 C0E2             LD      RDBLD      SET UP DELAY                3A011270
003D 0 1801             SRA     1          *                           3A011280
003E 0 90CF     RDLOP   S       RDONE      *                           3A011290
003F 0 4810             BSC     -          *                           3A011300
0040 0 70FD             MDX     RDLOP      *                           3A011310
0041 0 C0DE             LD      RDESW      CK IF ERR SW ON             3A011320
0042 0 4818             BSC     &-         *                           3A011330
0043 0 70ED             MDX     RDRST&4    NO, RD NXT CARD             3A011340
0044 0 C0DA             LD      RDBLD      YES, CK IF LOOP             3A011350
0045 0 100F             SLA     15         * ON ERROR(BIT 15)          3A011360
0046 0 4820             BSC     Z          *                           3A011370
0047 0 70ED             MDX     RDINT-2    YES, RD BIT SWS             3A011380
0048 0 C8C1             LDD     RDDSV-1    NO, DISPLAY RD ERR          3A011390
0049 0 3006             WAIT    6          * AND DSW AT WAIT 6         3A011400
004A 0 70E6             MDX     RDRST&4    RD NEXT CARD                3A011410
                *****************************************************  3A011420
004B 0 0040             DC      /0040      THE LAST FIVE WORDS ARE     3A011430
004C 0 9000             DC      /9000      * USED FOR PROGRAM          3A011440
004D 0 2000             DC      /2000      * IDENTIFICATION. THREE     3A011450
004E 0 2000             DC      /2000      * FOR THE PID AND TWO FOR   3A011460
004F 0 0004             DC      /0004      * SEQUENCE.                 3A011470
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                ************************************************** 3A011490
                *                                                  3A011500
6.08 2310 DISK SEEK *  1. THE PROGRAM ALLOWS THE HEAD TO ACCESS BACK  3A011510
                *     AND FORTH BETWEEN 2 CYLINDERS WHICH ARE      3A011520
                *     CONTROLLED BY THE OPERATOR.                  3A011530
                *  2. AN OPTION IS AVAILABLE TO ALLOW A WAIT AFTER  3A011540
                *     EACH SEEK OPERATION.                         3A011550
                *  3. THE PROGRAM CAN BE USED TO POSITION THE HEAD  3A011560
                *     BEFORE LOADING THE 2310 WRT/RD/COMPARE       3A011570
                *     PROGRAM. 6.09                                3A011580
                *                                                  3A011590
   A. PRELOAD SWS *  1. SET DESIRED DISK DRIVE AREA CODE IN BIT    3A011600
                *     SWITCHES 0 THRU 7.                           3A011610
                *              DRIVE 0 --- 20XX                    3A011620
                *              DRIVE 1 --- 88XX                    3A011630
                *              DRIVE 2 --- 90XX                    3A011640
                *              DRIVE 3 --- 98XX                    3A011650
                *              DRIVE 4 --- A0XX                    3A011660
                *  2. IF WAIT AFTER EACH SEEK OPERATION IS DESIRED, 3A011670
                *     SET BIT SWITCH 15 ON.                        3A011680
                *                                                  3A011690
   B. LOADING   *  LOAD IPL FROM CARD OR PAPER TAPE.               3A011700
                *                                                  3A011710
   C. WAITS   1 *  SET DESIRED HEX CYLINDER ADDRESS IN BIT         3A011720
                *  SWITCHES 0 THRU 7. SEE PAGE 2A.                 3A011730
                *  SET DESIRED HEX NUMBER OF CYLINDERS TO SEEK IN  3A011740
                *  BIT SWITCHES 8 THRU 15.                         3A011750
                *  DEPRESS START.                                  3A011760
                *                                                  3A011770
              5 *  NO INTERRUPT GENERATED AFTER INITIAL XIO SEEK   3A011780
                *  HOME WAS EXECUTED. SEE COMMENTS                 3A011790
                *                                                  3A011800
              6 *  NO INTERRUPT GENERATED AFTER XIO SEEK WAS       3A011810
                *  EXECUTED. SEE COMMENTS                          3A011820
                *                                                  3A011830
   D. RESTART   *  1. TO RESTART PROGRAM OR RESET SWITCH SETTINGS,  3A011840
                *     DEPRESS IMMEDIATE STOP AND RESET PUSH BUTTONS.3A011850
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.     3A011860
                *  3. DEPRESS START.                               3A011870
                *                                                  3A011880
   E. COMMENTS  *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.   3A011890
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON     3A011900
                *     AND TO BYPASS THE INTERRUPT WAIT, LOAD /6012 3A011910
                *     INTO LOCATIONS /0039 AND /0041.              3A011920
                *     DO A PROGRAM RESTART.                        3A011930
                *                                                  3A011940
                ************************************************** 3A011950
0000                    ORG     0                                  3A011960
0000 0 601B     DKBGN LDX       DKBLD   *A* TO /6020 LDX DKRST     3A011970
0001 0 0000     DKENT DC        *-*        INTERRUPT ENTRY SW      3A011980
0002 0 000E     DKBSW DC        DKBIT      BIT SW SAVE             3A011990
0003 0 003A           DC        /003A   *A* TO /3A00 RD BIT SWS    3A012000
0004 0 00CA     DKHME DC        202        MAX NUMBER OF SEEKS     3A012010
0005 0 0000           DC        *-*        IOCC-SEEK HOME          3A012020
0006 0 0000     DKSEK DC        *-*        NUMBER OF SEEKS         3A012030
0007 0 0000           DC        *-*        IOCC-SEEK               3A012040
0008 0 0000     DKDSW DC        *-*        AREA CODE/SW OPTIONS    3A012050
0009 0 0000           DC        *-*        IOCC-SENSE RESET DSW    3A012060
000A 0 0011           DC        DKIN2      INTERRUPT ADDRESS       3A012070
000B 0 0000     DKDSV DC        *-*        LAST DSW                3A012080
000C 0 0004     DK004 DC        /0004      CONSTANT 4              3A012090
000D 0 00FF     DKOFF DC        /00FF      CONSTANT FF             3A012100
000E 0 6020     DKBIT LDX       DKRST      RESET VECTER            3A012110
000F 0 7010     DKBD1 DC        /7010      DSW BUILD WORD          3A012120
0010 0 0808     DKBD2 DC        /0808      SEEK BUILD WORD         3A012130
0011 0 0000     DKIN2 DC        *-*        OP COMPLETE INTRPT      3A012140
0012 0 08F5           XIO       DKDSW      SENSE RESET DSW         3A012150
0013 0 D0F7           STO       DKDSV      SAVE DSW                3A012160
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0014 0 1002           SLA       2          CK RDY, NOT BUSY        3A012170
0015 0 4868           BOSC      &Z         *                       3A012180
0016 0 6012           LDX       DKIN2&1    NO, LOOP                3A012190
0017 0 C0E9           LD        DKENT      LD INTERRUPT ENTRY SW   3A012200
0018 0 4820           BSC       Z          CHECK IF ON             3A012210
0019 0 7020           MDX       DKMOV   NO, SEEK HOME ENTRY        3A012220
001A 0 7027           MDX       DKCON      YES, SEEK ENTRY         3A012230
001B 0 C0F2     DKBLD LD        DKBIT      BUILD RD BIT SW IOCC    3A012240
001C 0 D0E3           STO       DKBGN      * AND SET PROG RESET    3A012250
001D 0 C0E5           LD        DKBSW&1    * AND START VECTER      3A012260
001E 0 1008           SLA       8          *                       3A012270
001F 0 D0E3           STO       DKBSW&1    *                       3A012280
0020 0 08E1     DKRST XIO       DKBSW      RD AREA CODE AND        3A012290
0021 0 C0EC           LD        DKBIT      * PROG OPTIONS          3A012300
0022 0 D0E5           STO       DKDSW      SAVE SWS                3A012310
0023 0 180B           SRA       11         SET UP AREA CODE        3A012320
0024 0 100B           SLA       11         *                       3A012330
0025 0 D0E8           STO       DKBIT      SAVE AREA CODE          3A012340
0026 0 C0E8           LD        DKBD1      BUILD DSW AND SEEK      3A012350
0027 0 1804           SRA       4          * IOCCS                 3A012360
0028 0 E8E5           OR        DKBIT      *                       3A012370
0029 0 D0DF           STO       DKDSW&1    *                       3A012380
002A 0 C0E5           LD        DKBD2      *                       3A012390
002B 0 1801           SRA       1          *                       3A012400
002C 0 E8E1           OR        DKBIT      *                       3A012410
002D 0 D0D7           STO       DKHME&1    *                       3A012420
002E 0 D0D8           STO       DKSEK&1    *                       3A012430
002F 0 3001           WAIT      1          SET STARTING CYL.       3A012440
0030 0 08D1           XIO       DKBSW      * AND NUM OF CYLS.      3A012450
0031 0 C0DC           LD        DKBIT      * TO SEEK IN BIT SWS    3A012460
0032 0 1808           SRA       8          SET UP START CYL.       3A012470
0033 0 D0D2           STO       DKSEK      *                       3A012480
0034 0 08D3           XIO       DKDSW      SENSE DSW               3A012490
0035 0 D0D5           STO       DKDSV      SAVE DSW                3A012500
0036 0 C8D3           LDD       DKDSV-1    LOAD DSW IN Q REG       3A012510
0037 0 68C9           STX       DKENT      TURN ON INTRPT ENTRY SW 3A012520
0038 0 08CB           XIO       DKHME      SEEK HOME               3A012530
0039 0 3005           WAIT      5          WAIT FOR INTERRUPT      3A012540
003A 0 C0CC     DKMOV LD        DKSEK&1    SET UP SEEK             3A012550
003B 0 F0D0           EOR       DK004      * DIRECTION             3A012560
003C 0 D0CA           STO       DKSEK&1    *                       3A012570
003D 0 C8CC           LDD       DKDSV-1    LOAD DSW IN Q REG       3A012580
003E 0 1010           SLA       16         TURN OFF INTERRUPT      3A012590
003F 0 D0C1           STO       DKENT      * ENTRY SW              3A012600
0040 0 08C5           XIO       DKSEK      SEEK                    3A012610
0041 0 3006           WAIT      6          WAIT FOR INTERRUPT      3A012620
0042 0 C0CB     DKCON LD        DKBIT      SET UP NUM OF SEEKS     3A012630
0043 0 E0C9           AND       DKOFF      *                       3A012640
0044 0 D0C1           STO       DKSEK      *                       3A012650
0045 0 C0C2           LD        DKDSW      CK FOR SEEK AND WAIT    3A012660
0046 0 4804           BSC       E          *                       3A012670
0047 0 3002           WAIT      2          YES, WAIT               3A012680
0048 0 70F1           MDX       DKMOV      NO, GO SEEK             3A012690
                ************************************************** 3A012700
0049 0 0000           DC        0          SPACE FILLER            3A012710
004A 0 0000           DC        0          *                       3A012720
004B 0 0040           DC        /0040      THE LAST FIVE WORDS ARE 3A012730
004C 0 9000           DC        /9000      * USED FOR PROGRAM      3A012740
004D 0 2000           DC        /2000      * IDENTIFICATION. THREE 3A012750
004E 0 2000           DC        /2000      * FOR THE PID AND TWO FOR 3A012760
004F 0 0002           DC        /0002      * SEQUENCE.             3A012770
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                *****************************************************  3A012790
                *                                                     3A012800
6.09 2310 WRITE-*  THIS PROGRAM WRITES ON SECTOR 0, A DATA PATTERN    3A012810
     READ-COMPARE*  WHICH WAS SET IN THE BIT SWS. THE DATA IS THEN    3A012820
                *  READ AND COMPARED TO THE BIT SWITCHES. THE HEAD    3A012830
                *  MAY BE POSITIONED WITH SCOPE LOOP 6.08. THIS       3A012840
                *  WILL DESTROY THE SECTOR ADDRESS. IT MAY BE RE-     3A012850
                *  STORED BY PLACING THE SECTOR NUMBER IN THE BIT     3A012860
                *  SWITCHES AND EXECUTING THE PROGRAM ONCE.           3A012870
                *  THE PROGRAM WILL HALT AT WAIT 2 AFTER EACH PASS.   3A012880
                *                                                     3A012890
A. PRELOAD SWS  *  SET THE AREA CODE IN 0-7 FOR THE DISC TO BE USED   3A012900
                *            DRIVE 0 --- 20XX                         3A012910
                *            DRIVE 1 --- 88XX                         3A012920
                *            DRIVE 2 --- 90XX                         3A012930
                *            DRIVE 3 --- 98XX                         3A012940
                *            DRIVE 4 --- A0XX                         3A012950
                *                                                     3A012960
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                  3A012970
                *                                                     3A012980
C. WAITS     1  *  SET DATA IS BE WRITTEN IN SWITCHES 0-15.           3A012990
                *                                                     3A013000
             2  *  HALT AFTER ONE PASS. TO LOOP PROGRAM, LOAD /1000   3A013010
                *  INTO LOCATION /001E.                               3A013020
                *                                                     3A013030
             3  *  LOST WRITE INTERRUPT. SEE COMMENTS.                3A013040
                *                                                     3A013050
             4  *  LOST READ INTERRUPT. SEE COMMENTS.                 3A013060
                *                                                     3A013070
             6  *  COMPARE ERROR BETWEEN THE DATA READ AND THE BIT    3A013080
                *  SWITCHES. THE BITS IN ERROR WILL BE ON IN THE      3A013090
                *  ACCUMULATOR. TO LOOP ON ERROR, LOAD /1000 INTO     3A013100
                *  LOCATION /0017.                                    3A013110
                *                                                     3A013120
D. RESTART      *  1. TO RESTART PROGRAM OR RESET SWITCH SETTINGS,    3A013130
                *     DEPRESS IMMEDIATE STOP AND RESET PUSH BUTTONS   3A013140
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.        3A013150
                *  3. DEPRESS START.                                  3A013160
                *                                                     3A013170
E. COMMENTS     *  1. TO RUN THE PROG WITH INTERRUPT DELAY SWITCH     3A013180
                *     ON OR BYPASS THE INTERRUPT WAIT LOAD /600C      3A013190
                *     INTO LOCATION /0047 AND /004A AND RESTART.      3A013200
                *                                                     3A013210
                *  2. TO GET A FASTER LOOP THAN THE ABOVE PLACE       3A013220
                *     /70FE IN THE NEXT LOCATION AFTER THE XIO. THE   3A013230
                *     XIO WILL BE EXECUTED AFTER EACH BRANCH.         3A013240
                *                                                     3A013250
                *  3. IF INTERRUPT IS LOST, B REG WILL CONTAIN        3A013260
                *     DATA WORD AND ARITH REG WILL CONTAIN WAIT        3A013270
                *     NUMBER /0003 OR /0004.                          3A013280
                *                                                     3A013290
                *****************************************************  3A013300
0000                    ORG     0                                    3A013310
0000 0 6020     DCBGN LDX       DCBLD       GO TO PROG               3A013320
0001 0 0000     DCSWS DC        *-*         SW READ IN AREA          3A013330
0002 0 003A     DCON5 DC        /003A       CONSTANT                 3A013340
0003 0 0000     DCXR3 DC        *-*         INDEX REG 3              3A013350
0004 0 6000     DCON1 DC        /6000       CONSTANT                 3A013360
0005 0 7010           DC        /7010       CONSTANT                 3A013370
0006 0 2820     DCON2 DC        /2820       CONSTANT                 3A013380
0007 0 00C3           DC        /00C3       CONSTANT                 3A013390
0008 0 0001.    DCBSW DC        DCSWS       SW READ IN ADRS          3A013400
0009 0 0000           DC        /0000   *A* DC    /3A00  READ BIT SWS 3A013410
000A 0 0008           DC        DCINT       INTERRUPT ADRS           3A013420
0008 0 0000     DCINT DC        *-*         INTERRUPT ENTRY          3A013430
000C 0 083F           XIO       DCDSW       SENSE DSW                3A013440
000D 0 1001     DCON3 SLA       1           ALSO A CONSTANT          3A013450
000E 0 1001           SLA       1           *                        3A013460
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000F 0 4868           BOSC    &Z          IS DISK READY            3A013470
0010 0 600C           LDX     DCINT&1     * NO                     3A013480
0011 0 C03A           LD      DCDSW       * YES                    3A013490
0012 0 4818           BSC     &-          WAS LAST OP A READ       3A013500
0013 0 7034           MDX     DC6         * NO                     3A013510
0014 0 0000     DC5   DC      /0000   *A* LD   3 1                 3A013520
0015 0 F0EB           EOR     DCSWS       COMPARE SWS              3A013530
0016 0 4820           BSC     Z           ANY ERRORS               3A013540
0017 0 3006           WAIT    6           * YES                    3A013550
0018 0 C0EA           LD      DCXR3       ADJ I/O ADRS             3A013560
0019 0 80EE           A       DCBSW       *                        3A013570
001A 0 D0E8           STO     DCXR3       *                        3A013580
001B 0 F02F           EOR     DCEND       *                        3A013590
001C 0 4820           BSC     Z           REACHED LIMIT            3A013600
001D 0 70F6           MDX     DC5         * NO                     3A013610
001E 0 3002           WAIT    2           ONE PASS COMPLETE        3A013620
001F 0 701C           MDX     DC1         START OVER               3A013630
                *             INITIALIZATION                       3A013640
0020 0 C0E1     DCBLD LD      DCON5       GET CONSTANT             3A013650
0021 0 1008           SLA     8                                    3A013660
0022 0 D0E6           STO     DCBSW&1     READ BIT SW IOCC         3A013670
0023 0 08E4           XIO     DCBSW       READ SWS                 3A013680
0024 0 C8DC           LDD     DCSWS       GET AREA CODE            3A013690
0025 0 18CC           RTE     12          A- /000X  Q- /000X       3A013700
0026 0 88DD           AD      DCON1       A- /600X  Q- /701X       3A013710
0027 0 18C4           RTE     4           A- /X600  Q- /X701       3A013720
0028 0 D823           STD     DCDSW       SET DSW IOCC             3A013730
0029 0 18D0           RTE     16          A- /X701  Q- /X600       3A013740
002A 0 C0D9           LD      DCON1       A- /6000  Q- /X600       3A013750
002B 0 1808           SRA     8           A- /0060  Q- /X600       3A013760
002C 0 D821           STD     DCRD        SET READ IOCC            3A013770
002D 0 18CB           RTE     11          A- /C000  Q- /0C0X       3A013780
002E 0 F0D5           EOR     DCON1       A- /A000  Q- /0C0X       3A013790
002F 0 18D5           RTE     21          A- /0060  Q- /X500       3A013800
0030 0 D81F           STD     DCWR        SET WRITE IOCC           3A013810
0031 0 C8D4           LDD     DCON2       A- /2820  Q- /00C3       3A013820
0032 0 1805           SRA     5           A- /0141  Q- /00C3       3A013830
0033 0 D02C           STO     /0060       SET WORD COUNT           3A013840
0034 0 801B           A       DCWR        A- /01A1  Q- /00C3       3A013850
0035 0 D0CD           STO     DCXR3       SET INDEX REG 3          3A013860
0036 0 D014           STO     DCEND       SET LIMIT CNTL           3A013870
0037 0 18C8           RTE     8           A- /C301  Q- /A100       3A013880
0038 0 D0DB           STO     DC5         SET  LD    3 1           3A013890
0039 0 F0D3           EOR     DCON3       A- /D300  Q- /A100       3A013900
003A 0 D003           STO     DC3         SET  STO   3 0           3A013910
003B 0 3001           WAIT    1           SET DATA PATTERN         3A013920
003C 0 08CB     DC1   XIO     DCBSW       READ BIT SWS             3A013930
003D 0 C0C3           LD      DCSWS       GET BIT SWS              3A013940
003E 0 0000     DC3   DC      /0000   *A* STO  3 0                 3A013950
003F 0 C0C3           LD      DCXR3       ADJ I/O ADRS             3A013960
0040 0 90C7           S       DCBSW       *                        3A013970
0041 0 D0C1           STO     DCXR3       *                        3A013980
0042 0 F00D           EOR     DCWR                                 3A013990
0043 0 4820           BSC     Z           REACHED LIMIT            3A014000
0044 0 70F8           MDX     DC3-1       * NO                     3A014010
0045 0 D006           STO     DCDSW       * YES, CLEAR SW          3A014020
0046 0 0809           XIO     DCWR        WRITE A RECORD           3A014030
0047 0 3003           WAIT    3           WAIT FOR WRITE INTR      3A014040
0048 0 6803     DC6   STX     DCDSW       SET SWITCH               3A014050
0049 0 0804           XIO     DCRD        READ A RECORD            3A014060
004A 0 3004           WAIT    4           WAIT FOT READ INTR       3A014070
                *****************************************************  3A014080
004B 0 0040     DCEND DC      /0040       THE NEXT FIVE WORDS ARE  3A014090
004C 0 9000     DCDSW DC      /9000       * USED FOR PROGRAM       3A014100
004D 0 2000           DC      /2000       * IDENTIFICATION. THREE  3A014110
004E 0 2000     DCRD  DC      /2000       * FOR THE PID AND TWO FOR 3A014120
004F 0 0001           DC      /0001       * SEQUENCE.              3A014130
0050 0          DCWR  EQU     DCRD&2                               3A014140
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                *****************************************************  3A014160
                *                                                     3A014170
6.10 1627 PLOTTER *  1. THE PROGRAM EXECUTES ALTERNATE FUNCTIONS       3A014180
                *     WHICH HAVE BEEN SELECTED IN THE BIT SWS         3A014190
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE     3A014200
                *     DELAY BETWEEN XIO WRITE EXECUTIONS.             3A014210
                *  3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM      3A014220
                *     AFTER THE COMPLETION OF THE EXECUTION OF        3A014230
                *     AN ALTERNATE XIO SEQUENCE.                      3A014240
                *                                                     3A014250
   A. PRELOAD SWS *  1. IF DELAY IS DESIRED, SET DELAY CONTROL        3A014260
                *     VALUE IN BIT SWITCHES 1 THRU 13.                3A014270
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.         3A014280
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.         3A014290
                *  2. IF A WAIT AFTER EACH PROGRAM PASS IS            3A014300
                *     DESIRED, TURN ON BIT SWITCH 15.                 3A014310
                *                                                     3A014320
   B. LOADING   *  LOAD IPL FROM CARD OR PAPER TAPE.                  3A014330
                *                                                     3A014340
   C. WAITS   1 *  SET DESIRED FUNCTION CODES IN BIT SWITCHES         3A014350
                *  0 THRU 15. SEE PAGE 2A FOR BIT SW CODES.           3A014360
                *        1ST FUNCTION CODE IN SWS 0 THRU 5.           3A014370
                *        2ND FUNCTION CODE IN SWS 8 THRU 13.          3A014380
                *  TURN ON PLOTTER AND MAKE READY.                    3A014390
                *  DEPRESS START.                                     3A014400
                *                                                     3A014410
              2 *  NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN      3A014420
                *  SELECTED. DEPRESS START TO MAKE ANOTHER PASS.       3A014430
                *                                                     3A014440
              3 *  NO INTERRUPT GENERATED AFTER XIO WRITE             3A014450
                *  COMMAND WAS GIVEN. SEE COMMENTS.                   3A014460
                *                                                     3A014470
   D. RESTART   *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD     3A014480
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE              3A014490
                *     STOP AND RESET PUSH BUTTONS.                    3A014500
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.        3A014510
                *  3. DEPRESS START.                                  3A014520
                *                                                     3A014530
   E. COMMENTS  *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.      3A014540
                *  2. IF NO FUNCTION ENTERED IN BIT SWS, PROGRAM      3A014550
                *     STOPS AT WAIT 1.                                3A014560
                *  3. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON       3A014570
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /600D     3A014580
                *     INTO LOCATION /0034 AND DO A PROGRAM RESTART.   3A014590
                *  4. TO SET UP LOOP TO EXECUTE XIO, LOAD /600D       3A014600
                *     INTO LOCATION /0034 AND LOAD /6035 INTO         3A014610
                *     LOCATION /0010 AND DO A PROGRAM RESTART.        3A014620
                *                                                     3A014630
                *****************************************************  3A014640
0000                    ORG     0                                     3A014650
0000 0 6012     PLBGN LDX       PLBLD   *A* TO /601E LDX PLRDS        3A014660
0001 0 0001     PLONE DC        1          CONSTANT ONE               3A014670
0002 0 0006     PLBSW DC        PLDSW      BIT SW SAVE AREA           3A014680
0003 0 003A           DC        /003A   *A* TO /3A00 RD BIT SWS       3A014690
0004 0 0006     PLOT  DC        PLDSW      CHARACTER ADDRESS          3A014700
0005 0 0029           DC        /0029   *A* TO /2900 XIO WRITE        3A014710
0006 0 0000     PLDSW DC        *-*        BIT SW READIN AREA         3A014720
0007 0 002F           DC        /002F   *A* TO /2F01 XIO SENSE        3A014730
0008 0 601E     PLRST LDX       PLRDS      RESET START MOD            3A014740
0009 0 0000     PLDSV DC        *-*        DSW SAVE AREA              3A014750
000A 0 0000     PLSET DC        *-*        SW OPTION/DELAY SAVE       3A014760
000B 0 000C           DC        PLIN3      INTERRUPT ADDRESS          3A014770
000C 0 0000     PLIN3 DC        *-*        INTERRUPT LEVEL 3          3A014780
000D 0 08F8           XIO       PLDSW      SENSE RESET DSW            3A014790
000E 0 D0FA           STO       PLDSV      SAVE DSW                   3A014800
000F 0 4850           BOSC      -          RESET INT LEVEL            3A014810
0010 0 70FC           MDX       PLIN3&1    RESENSE DSW                3A014820
0011 0 7023           MDX       PLRET      BRANCH TO DELAY            3A014830
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0012 0 C0F2     PLBLD LD        PLOT&1     BUILD WRITE IOCC           3A014840
0013 0 1008     PLCTL SLA       8          * 2ND CHAR SW              3A014850
0014 0 D0F0           STO       PLOT&1     *                          3A014860
0015 0 C0F1           LD        PLDSW&1    BUILD SENSE RESET          3A014870
0016 0 1008           SLA       8          *                          3A014880
0017 0 E8E9           OR        PLONE      *                          3A014890
0018 0 D0EE           STO       PLDSW&1    *                          3A014900
0019 0 C0E9           LD        PLBSW&1    BUILD READ BIT SW          3A014910
001A 0 1008           SLA       8          * IOCC                     3A014920
001B 0 D0E7           STO       PLBSW&1    *                          3A014930
001C 0 C0EB           LD        PLRST      SET UP RESET AND           3A014940
001D 0 D0E2           STO       PLBGN      * START BRANCH             3A014950
001E 0 08E3     PLRDS XIO       PLBSW      READ BIT SWS FOR           3A014960
001F 0 C0E6           LD        PLDSW      * PROG OPTS/DELAY          3A014970
0020 0 D0E9           STO       PLSET      *                          3A014980
0021 0 3001           WAIT      1          SET CHARS IN SWS           3A014990
0022 0 08DF     PLSTR XIO       PLBSW      READ BIT SWS               3A015000
0023 0 C0E2           LD        PLDSW      CK FOR NO COMMAND          3A015010
0024 0 180A           SRA       10         * ENTERED                  3A015020
0025 0 4808           BSC       &          *                          3A015030
0026 0 70FA           MDX       PLSTR-1    * NO, SENSE SWS            3A015040
0027 0 C0DE           LD        PLDSW      *                          3A015050
0028 0 1008           SLA       8          *                          3A015060
0029 0 180A           SRA       10         *                          3A015070
002A 0 4808           BSC       &          *                          3A015080
002B 0 70F5           MDX       PLSTR-1    * NO, SENSE SWS            3A015090
002C 0 C8DB     PLSEN LDD       PLDSV-1    LOAD LAST DSW IN Q .       3A015100
002D 0 08D8           XIO       PLDSW      CHK DEVICE NOT BUSY        3A015110
002E 0 D0DA           STO       PLDSV      SAVE DSW                   3A015120
002F 0 1004           SLA       4          *                          3A015130
0030 0 4828           BSC       &Z         *                          3A015140
0031 0 70FA           MDX       PLSEN      *                          3A015150
0032 0 C8D5           LDD       PLDSV-1    LOAD LAST DSW IN Q .       3A015160
0033 0 08D0           XIO       PLOT       WRITE CHARACTER            3A015170
0034 0 3003           WAIT      3          WAIT FOR INTERUPT          3A015180
0035 0 C8D2     PLRET LDD       PLDSV-1    LOAD LAST DSW IN Q .       3A015190
0036 0 C0D3           LD        PLSET      SET UP DELAY AND           3A015200
0037 0 1801           SRA       1          * EXECUTE DELAY            3A015210
0038 0 90C8     PLLOP S         PLONE      *                          3A015220
0039 0 4810           BSC       -          *                          3A015230
003A 0 70FD           MDX       PLLOP      *                          3A015240
003B 0 C0CA           LD        PLDSW      LD, SET UP 2ND CHAR        3A015250
003C 0 4804           BSC       E          CHK IF WAIT REQUSTED       3A015260
003D 0 3002           WAIT      2          YES                        3A015270
003F 0 1802           SRA       2          NO, CHK 2ND CHAR OK        3A015280
003F 0 4818           BSC       &-         *                          3A015290
0040 0 70E0           MDX       PLSTR-1    NO, GO TO WAIT 1           3A015300
0041 0 100A           SLA       10         YES, SET UP 2ND CHAR       3A015310
0042 0 D0C3           STO       PLDSW      *                          3A015320
0043 0 C0CF           LD        PLCTL      CHK IF 2ND CHAR SW         3A015330
0044 0 4820           BSC       Z          * OFF                      3A015340
0045 0 7002           MDX       PLALT      NO, BRANCH                 3A015350
0046 0 68CC           STX       PLCTL      YES, SET 2ND CHAR SW       3A015360
0047 0 70DA           MDX       PLSTR      GO LOOP PROGRAM            3A015370
0048 0 1010     PLALT SLA       16         CLR 2ND CHAR SW            3A015380
0049 0 D0C9           STO       PLCTL      *                          3A015390
004A 0 70E1           MDX       PLSEN      GO CHK IF PRINT BUSY       3A015400
                *****************************************************  3A015410
004B 0 0040           DC        /0040      THE LAST FIVE WORDS ARE    3A015420
004C 0 9000           DC        /9000      * USED FOR PROGRAM         3A015430
004D 0 2000           DC        /2000      * IDENTIFICATION. THREE    3A015440
004E 0 1000           DC        /1000      * FOR THE PID AND TWO FOR  3A015450
004F 0 2000           DC        /2000      * SEQUENCE.                3A015460
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                *************************************************** 3A015480
                *                                                   3A015490
6.11 2501 READER*  1. THE PROGRAM READS 80 COLUMNS OF DATA AND      3A015500
                *     COMPARES EACH WORD WITH THE BIT SWITCHES.     3A015510
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE   3A015520
                *     DELAY BETWEEN XIO READ EXECUTIONS.            3A015530
                *  3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6       3A015540
                *     ON COMPARE ERRORS.                            3A015550
                *                                                   3A015560
A. PRELOAD SWS  *  1. IF DELAY IS DESIRED, SET DELAY CONTROL       3A015570
                *     VALUE IN BIT SWITCHES 1 THRU 13.              3A015580
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.       3A015590
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.       3A015600
                *  2. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS      3A015610
                *     DESIRED, TURN ON BIT SWITCH 15.               3A015620
                *                                                   3A015630
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                3A015640
                *                                                   3A015650
C. WAITS     1  *  SET BIT SWS 0 THRU 11 TO EXPECTED COLUMN         3A015660
                *  DATA AND SET BITS 12 THRU 15 OFF.                3A015670
                *  LOAD PREPUNCHED CARDS INTO READER AND MAKE READY.3A015680
                *  DEPRESS START.                                   3A015690
                *                                                   3A015700
             4  *  NO INTERRUPT GENERATED AFTER XIO READ.           3A015710
                *  COMMAND WAS GIVEN. SEE COMMENTS.                 3A015720
                *                                                   3A015730
             6  *  COMPARE ERROR. ACCUMULATOR CONTAINS BITS READ.   3A015740
                *  IF ACCUMULATOR CONTAINS /DOCB, COLUMN READ WAS   3A015750
                *  NOT STORED INTO READ/IN AREA.                    3A015760
                *  DEPRESS START TO COMPARE NEXT COLUMN.            3A015770
                *  TO BYPASS COMPARE ERROR WAIT, SEE PRELOAD.       3A015780
                *                                                   3A015790
D. RESTART      *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD   3A015800
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE            3A015810
                *     STOP AND RESET PUSH BUTTONS.                  3A015820
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.      3A015830
                *  3. DEPRESS START.                                3A015840
                *                                                   3A015850
E. COMMENTS     *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.    3A015860
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON     3A015870
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /600F   3A015880
                *     INTO LOCATION /002F AND DO A PROGRAM RESTART. 3A015890
                *  3. TO SET UP LOOP TO EXECUTE XIO, LOAD /600F     3A015900
                *     INTO LOCATION /002F AND LOAD /6027 INTO       3A015910
                *     LOCATION /0013 AND DO A PROGRAM RESTART.      3A015920
                *                                                   3A015930
                *************************************************** 3A015940
0000                    ORG     0                                   3A015950
0000 0 6035     CRBGN LDX       CRBLD   *A* TO /6030 LDX CRRST      3A015960
0001 0 0001     CRONE DC        1          CONSTANT 1               3A015970
0002 0 0004     CRBSW DC        CRDSW      BIT SW SAVE ADDR         3A015980
0003 0 003A           DC        /003A      *A* TO /3A00 RD BIT SWS  3A015990
0004 0 6030     CRDSW LDX       CRRST      BIT SW SAVE AREA         3A016000
0005 0 0027           DC        /0027   *A* TO /4F01 XIO SENSE DSW  3A016010
0006 0 0036     CRRDR DC        CRARA      CARD READ IN ADDR        3A016020
0007 0 0027           DC        /0027   *A* TO /4E00 XIO START RDR  3A016030
0008 0 00FF     CRERR DC        /00FF      SAVE READ ERROR          3A016040
0009 0 0000     CRDSV DC        *-*        LAST DSW SENSED          3A016050
000A 0 0000     CREND DC        *-*     *A* TO /D11A END OF RD AREA 3A016060
000B 0 C022     CRSRA DC        /C022      LD READ AREA             3A016070
000C 0 000E           DC        CRIN4      INTERRUPT ADDR           3A016080
000D 0 0005     CR080 DC        /0005   *A* TO /0050 CONSTANT 80    3A016090
000F 0 0000     CRIN4 DC        *-*        INTERRUPT ENTRY          3A016100
000F 0 08F4           XIO       CRDSW      SENSE DSW                3A016110
0010 0 00F8           STO       CRDSV      SAVE DSW                 3A016120
0011 0 1004           SLA       4          CK FOR OP COMPLETE       3A016130
0012 0 4850           BOSC      -          *                        3A016140
0013 0 70FB           MDX       CRIN4&1    NO, RESENSE DSW          3A016150
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0014 0 C022     CRLD  LD        CRARA&1    LOAD COLUMN READ         3A016160
0015 0 00F2           STO       CRERR      SAVE BITS READ           3A016170
0016 0 F0ED           EOR       CRDSW      COMPARE WITH PATT WD     3A016180
0017 0 4818           BSC       &-         CK FOR COMPARE ERR       3A016190
0018 0 7006           MDX       CRMOD      NO, SET UP NEXT CHK      3A016200
0019 0 C01B           LD        CRBLD      YES, CK LOOP OPT         3A016210
001A 0 100F           SLA       15         *                        3A016220
001B 0 4828           BSC       &Z         *                        3A016230
001C 0 700A           MDX       CRLOP-3    LOOP ERR OPTION ON       3A016240
001D 0 C8EA           LDD       CRERR      LD DSW AND ERR BITS      3A016250
001E 0 3006           WAIT      6          COMPARE ERROR WAIT       3A016260
001F 0 C0F4     CRMOD LD        CRLD       SET UP NEXT COMPARE      3A016270
0020 0 80E0           A         CRONE      *                        3A016280
0021 0 00F2           STO       CRLD       *                        3A016290
0022 0 90E7           S         CREND      CK IF ALL COLUMNS        3A016300
0023 0 4828           BSC       &Z         * CHECKED                3A016310
0024 0 70EF           MDX       CRLD       NO, COMPARE NXT COL      3A016320
0025 0 C0F5           LD        CRSRA      SET UP FOR NXT CARD      3A016330
0026 0 00ED           STO       CRLD       *                        3A016340
0027 0 C8E0           LDD       CRERR      LOAD LAST DSW IN Q       3A016350
0028 0 C00C           LD        CRBLD      SET UP DELAY             3A016360
0029 0 1801           SRA       1          *                        3A016370
002A 0 90D6     CRLOP S         CRONE      *                        3A016380
002B 0 4810           BSC       -          *                        3A016390
002C 0 70FD           MDX       CRLOP      *                        3A016400
002D 0 08D4     CRSTR XIO       CRBSW      RD BIT SWS PATT WD       3A016410
002E 0 08D7           XIO       CRRDR      READ A CARD              3A016420
002F 0 3004           WAIT      4          WAIT FOR INTERRUPT       3A016430
0030 0 08D1     CRRST XIO       CRBSW      RD SWS FOR DELAY/OPT     3A016440
0031 0 C0D2           LD        CRDSW      SAVE DELAY/OPTIONS       3A016450
0032 0 00D2           STO       CRBLD      *                        3A016460
0033 0 3001           WAIT      1          SET PATTERN IN SWS       3A016470
0034 0 70F8           MDX       CRSTR      GO READ BIT SWS          3A016480
0035 0 C0CD     CRBLD LD        CRBSW&1    BUILD PROGRAM            3A016490
0036 0 1008     CRARA SLA       8       *A* TO /0050 WD CNT 80      3A016500
0037 0 00CB           STO       CRBSW&1 *A* TO *-* READ/IN AREA     3A016510
0038 0 C0CB           LD        CRDSW      *                        3A016520
0039 0 00C6           STO       CRBGN      *                        3A016530
003A 0 C0CA           LD        CRDSW&1    *                        3A016540
003B 0 1001           SLA       1          *                        3A016550
003C 0 E8C4           OR        CRONE      *                        3A016560
003D 0 1008           SLA       8          *                        3A016570
003E 0 E8C2           OR        CRONE      *                        3A016580
003F 0 00C5           STO       CRDSW&1    *                        3A016590
0040 0 C0C6           LD        CRRDR&1    *                        3A016600
0041 0 1009           SLA       9          *                        3A016610
0042 0 00C4           STO       CRRDR&1    *                        3A016620
0043 0 C0C9           LD        CR080      *                        3A016630
0044 0 1004           SLA       4          *                        3A016640
0045 0 00F0           STO       CRARA      *                        3A016650
0046 0 80C4           A         CRSRA      *                        3A016660
0047 0 00C2           STO       CREND      *                        3A016670
0048 0 70E7           MDX       CRRST      EXECUTE PROGRAM          3A016680
                *************************************************** 3A016690
0049 0 0000           DC        0          SPACE FILLER             3A016700
004A 0 0000           DC        0          *                        3A016710
004B 0 0040           DC        /0040      THE LAST FIVE WORDS ARE  3A016720
004C 0 9000           DC        /9000      * USED FOR PROGRAM       3A016730
004D 0 2000           DC        /2000      * IDENTIFICATION. THREE  3A016740
004E 0 1000           DC        /1000      * FOR THE PID AND TWO FOR 3A016750
004F 0 1000           DC        /1000      * SEQUENCE.              3A016760
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                         ************************************************** 3A016780
                         *                                                3A016790
6.12 1403 PRINTER        *  THIS PROGRAM WILL PRINT ANY CHARACTER ENTERED  3A016800
                         *  IN THE BIT SWITCHES 1-7 AND 9-15. IF BIT 14 IS ON3A016810
                         *  THE BIT SWS 1-12 WILL BE THE CHANNEL THAT THE  3A016820
                         *  CARRIAGE WILL SKIP TO AFTER PRINTING.          3A016830
                         *                                                3A016840
   A. PRELOAD SWS        *  BIT SW 15- HALT AFTER ONE PASS.                3A016850
                         *         14- CARR SKIP FUNCTION.                 3A016860
                         *  1 THRU 12- CHANNEL NUMBER TO USE FOR SKIP.     3A016870
                         *                                                3A016880
   B. LOADING            *  IPL MODE FROM CARDS OR PAPER TAPE.             3A016890
                         *                                                3A016900
   C. WAIT          1    *  SET CHARACTER TO PRINT, 1-7 AND 9-15.          3A016910
                         *                                                3A016920
                    2    *  ONE PASS COMPLETED, PRESS START TO CONTINUE.   3A016930
                         *                                                3A016940
                    3    *  LOST PRINTER INTERRUPT.                        3A016950
                         *                                                3A016960
                    5    *  LOST CARRIAGE INTERRUPT.                       3A016970
                         *                                                3A016980
                    6    *  PARITY ERROR FOUND IN THE DSW.                 3A016990
                         *                                                3A017000
   D. RESTART            *  PRESS IMMEDIATE STOP AND RESET. PRELOADING     3A017010
                         *  SWITCHES MAY BE SET AS DESIRED. PRESS START.   3A017020
                         *                                                3A017030
   E. COMMENTS           *  1. TO RUN THE PROG WITH INTERRUPT DELAY SWITCH 3A017040
                         *     ON OR BYPASS THE INTERRUPT WAIT LOAD /601F  3A017050
                         *     INTO LOCATION /001D AND /0030 AND RESTART.  3A017060
                         *                                                3A017070
                         *  2. TO GET A FASTER LOOP THAN THE ABOVE PLACE   3A017080
                         *     /70FE IN THE NEXT LOCATION AFTER THE XIO. THE 3A017090
                         *     XIO WILL BE EXECUTED AFTER EACH BRANCH.     3A017100
                         *                                                3A017110
                         ************************************************** 3A017120
0000                           ORG    0                                    3A017130
0000 0 6033                    LDX    FPBLD   *A* LDX   FPSTR              3A017140
0001 0 0000              FPSWS DC     *-*        BIT SWITCH STG            3A017150
0002 0 D000              FPDSW DC     /D000   *A* WORD COUNTER             3A017160
0003 0 F010                    DC     /F010   *A* DC    /AF01              3A017170
0004 0 9000              FPCAR DC     /9000      CHANNEL BITS              3A017180
0005 0 C000                    DC     /C000   *A* DC    /AC00 CARR CNTL    3A017190
0006 0 0001              FPBSW DC     FPSWS      BIT SW STG ADRS & ONE     3A017200
0007 0 003A                    DC     /003A   *A* DC    /3A00  READ BIT SWS 3A017210
0008 0 0004              FPSKP DC     FPCAR      CARR CHAN ADRS            3A017220
0009 0 9000                    DC     /9000   *A* DC    /A900  SKIP IOCC   3A017230
000A 0 0033              FPPRT DC     FPOUT&1    PRINT AREA ADRS           3A017240
000B 0 000A                    DC     /000A   *A* DC    /AD00 PRINT IOCC   3A017250
000C 0 001E                    DC     FPINT      INTERRUPT ADRS            3A017260
                         *                                                3A017270
                         *              START AND RESTART OF PROGRAM      3A017280
                         *                                                3A017290
000D 0 08F8              FPSTR XIO      FPBSW      READ BIT SWITCHES         3A017300
000E 0 C0F2                    LD       FPSWS      GET SW SETTINGS           3A017310
000F 0 D0EE                    STO      FPSWS-3    * AND SAVE                3A017320
0010 0 1803                    SRA      3                                    3A017330
0011 0 D0F2                    STO      FPCAR      SET CHAN NUMBER           3A017340
0012 0 3001                    WAIT     1          SET CONSOLE SWS           3A017350
0013 0 08F2              FP1   XIO      FPBSW      READ PRINTER CODE         3A017360
0014 0 C01D                    LD       FPOUT      GET WORD COUNT            3A017370
0015 0 D0EC                    STO      FPDSW      LOAD XR 2                 3A017380
0016 0 C0EA                    LD       FPSWS      GET PRINT CODE            3A017390
0017 0 00D2              FP2   DC       /00D2   *A* STO  2 FPOUT             3A017400
0018 0 C0E9                    LD       FPDSW      GET COUNT AND             3A017410
0019 0 90EC                    S        FPBSW      * SUB ONE                 3A017420
001A 0 4820                    BSC      Z          AREA FILLED               3A017430
001B 0 70F9                    MDX      FP2-2      * NO                      3A017440
001C 0 08ED                    XIO      FPPRT      PRINT A LINE              3A017450
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001D 0 3003                    WAIT   3          WAIT FOR PRINT INTERRUPT   3A017460
001E 0 0000              FPINT DC     *-*        INTERRUPT ENTRY           3A017470
001F 0 08E2                    XIO    FPDSW      SENSE DSW                 3A017480
0020 0 4844                    BOSC   E          IS PRINTER READY          3A017490
0021 0 601F                    LDX    FPINT&1    * NO                      3A017500
0022 0 4828                    BSC    &Z         PARITY ERROR              3A017510
0023 0 3006                    WAIT   6          * YES                     3A017520
0024 0 1002                    SLA    2          * NO                      3A017530
0025 0 4810                    BSC    -          PRINT COMPLETE            3A017540
0026 0 70EC                    MDX    FP1        * NO, CARR INTR           3A017550
0027 0 C0D6                    LD     FPSWS-3    GET CONTROLS              3A017560
0028 0 4804                    BSC    E          HALT ON                   3A017570
0029 0 3002                    WAIT   2          * YES                     3A017580
002A 0 100E                    SLA    14         * NO                      3A017590
002B 0 4810                    BSC    -          CARR SKIP FUNC            3A017600
002C 0 7002                    MDX    FP8        * NO                      3A017610
002D 0 08DA                    XIO    FPSKP      SKIP TO CHAN              3A017620
002E 0 7001                    MDX    FP8&1      GO WAIT INTERRUPT         3A017630
002F 0 08D4              FP8   XIO    FPCAR      * YES, SPACE              3A017640
0030 0 3005                    WAIT   5          WAIT FOR CARR INTR        3A017650
                         *                                                3A017660
0031 0 0001              FPO01 DC     /0001      CONSTANT                  3A017670
0032 0 003C              FPOUT DC     60         WORD COUNT                3A017680
                         *                                                3A017690
                         *              THIS WILL BE THE PRINT AREA AFTER 3A017700
                         *              INITIALIZATION                    3A017710
                         *                                                3A017720
0033 0 C013              FPBLD LD     FPRES                                3A017730
0034 0 D0CB                    STO    0          * SET RESTART             3A017740
0035 0 C8D5                    LDD    FPPRT+1    *  A- /000A  Q- /000A     3A017750
0036 0 88CD                    AD     FPCAR      *  A- /C00A  Q- /900A     3A017760
0037 0 18C4                    RTE    4          *  A- /AC00  Q- /A900     3A017770
0038 0 D8CB                    STD    FPCAR      * CONTROL IOCC            3A017780
0039 0 D0CF                    STO    FPSKP&1    * SKIP IOCC               3A017790
003A 0 C8D0                    LDD    FPPRT+1    *  A- /000A  Q- /000A     3A017800
003B 0 88C6                    AD     FPDSW      *  A- /D00A  Q- /F01A     3A017810
003C 0 18C4                    RTE    4          *  A- /AD00  Q- /AF01     3A017820
003D 0 D8C4                    STD    FPDSW      * SENSE DSW IOCC          3A017830
003E 0 D0CC                    STO    FPPRT&1    * PRINT IOCC              3A017840
003F 0 C0C7                    LD     FPBSW&1    *                         3A017850
0040 0 1008                    SLA    8          *                         3A017860
0041 0 D0C5                    STO    FPBSW&1    * READ BIT SW IOCC        3A017870
0042 0 C0D4                    LD     FP2        *                         3A017880
0043 0 1008                    SLA    8          *                         3A017890
0044 0 E8C5                    OR     FPPRT      *                         3A017900
0045 0 90EB                    S      FP001      ADJUST DISPLACEMENT       3A017910
0046 0 D0D0                    STO    FP2        * BUILD  STO   2 FPPRT     3A017920
0047 0 600D              FPRES LDX    FPSTR      GO TO PROGRAM             3A017930
                         ************************************************** 3A017940
0048 0 0000                    DC     0          SPACE FILLER              3A017950
0049 0 0000                    DC     0          *                         3A017960
004A 0 0000                    DC     0          *                         3A017970
004B 0 0040                    DC     /0040      THE LAST FIVE WORDS ARE   3A017980
004C 0 9000                    DC     /9000      * USED FOR PROGRAM        3A017990
004D 0 2000                    DC     /2000      * IDENTIFICATION. THREE   3A018000
004E 0 1000                    DC     /1000      * FOR THE PID AND TWO FOR 3A018010
004F 0 0800                    DC     /0800      * SEQUENCE.               3A018020
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                ******************************************************* 3A018040
                *                                                       3A018050
6.13 1132 PRINTER * THE CHARACTER ENTERED IN SWS 0-7 IS PRINTED IN      3A018060
                *  ALL PRINT POSITIONS.                                 3A018070
                *                                                       3A018080
    A. PRELOAD SWS *  BIT SW 15--HALT AFTER EACH LINE PRINTED.  SW 15   3A018090
                *             ALSO CAUSES ONE EXTRA IDLE SCAN CYCLE.    3A018100
                *             THIS HAS A NEGLIGIBLE AFFECT ON SPEED.    3A018110
                *       8-15--PRINT SPEED CONTROL--ENTER THE            3A018120
                *             DESIRED NUMBER OF IDLE SCAN CYCLES        3A018130
                *             TO BE TAKEN BETWEEN PRINT CYCLES.         3A018140
                *       0-7=VALID CHARACTER--PRINT CHARACTER AS         3A018150
                *                   SHOWN ON PAGE 2.                    3A018160
                *       0-7=INVALID CHARACTER--IDLE CONTINOUSLY.        3A018170
                *                                                       3A018180
                *  NOTE--PROGRAM ALWAYS TURNS ON BIT 10 TO PREVENT      3A018190
                *        OPERATING AT EXCESSIVE SPEEDS.  SPEED MAY      3A018200
                *        BE INCREASED BY MANUALLY CHANGING CONSTANT     3A018210
                *        AT CORE LOCATION 0008. USE CAUTION.            3A018220
                *                                                       3A018230
                *  SWITCH SETTINGS MAY BE CHANGED AT ANY TIME.          3A018240
                *                                                       3A018250
    B. LOADING  *  IPL MODE FROM CARDS OR PAPER TAPE                    3A018260
                *                                                       3A018270
    C. WAIT  2  *  ONE PASS COMPLETED, PRESS START TO CONTINUE.         3A018280
                *                                                       3A018290
             3  *  NO EMITTER RESPONSE INTRPT, RESTART TO CONTINUE      3A018300
                *                                                       3A018310
             5  *  NO SPACE RESPONSE INTERRUPT, RESTART TO CONTINUE     3A018320
                *                                                       3A018330
    D. RESTART  *  PRESS IMMEDIATE STOP AND RESET. PRELOADING          3A018340
                *  SWITCHES MAY BE SET AS DESIRED. PRESS START.         3A018350
                *                                                       3A018360
    E. COMMENTS *  TO RUN WITHOUT INTERRUPTS..MANUALLY ENTER            3A018370
                *  HEX 600B AT CORE LOCATIONS 0001 AND 003A.            3A018380
                *                                                       3A018390
                *  TO CHANGE POSITIONS PRINTED..MANUALLY ENTER          3A018400
                *  DESIRED PATTERN IN CORE LOCATIONS 001E AND 001F.     3A018410
                *  AT LEAST ONE BIT MUST BE ON IN SECOND WORD 001F.     3A018420
                *                                                       3A018430
                ******************************************************* 3A018440
0000 ,              ORG     0                                           3A018450
0000 0 6017     PRGO  LDX     PRDSW-1 *A* XIO     PRSPS  SPACE PTR      3A018460
0001 0 3005           WAIT    5           WAIT FOR INTERRUPT            3A018470
                *                                                       3A018480
0002 0 001A     PRRDS DC      PRSWS                                     3A018490
0003 0 00FF           DC      /00FF   *A* DC      /3A32  RD SWS         3A018500
0004 0 0018     PRRD  DC      PREMT                                     3A018510
0005 0 E8C8           DC      /E8C8   *A* DC      /3200  RD EMITTER      3A018520
0006 0 7013           DC      /7013                                     3A018530
0007 0 4803           DC      /4803                                     3A018540
0008 0 0020     PRIDL DC      /0020       MINIMUM IDLE SCAN CYCLES      3A018550
0009 0 000A           DC      PRINT       INTERRUPT ADDRESS             3A018560
000A 0 0827     PRINT DC      /0827       INTERRUPT ENTRY               3A018570
000B 0 080C           XIO     PRDSW                                     3A018580
000C 0 4850           BOSC    -           EMITTER RESPONSE              3A018590
000D 0 7023           MDX     PRSPR       * NO, TRY SPACE RESPONSE      3A018600
000E 0 C018           LD      PRSCN+7                                   3A018610
000F 0 4820           BSC     Z           SCAN FIELD ZERO               3A018620
0010 0 7018           MDX     PREND       * NO, GO STOP PRINTER         3A018630
0011 0 C039           LD      PRDLY                                     3A018640
0012 0 4808           BSC     +           LAST IDLE SCAN CYCLE          3A018650
0013 0 7027           MDX     PRPRT       * YES, GO PRINT               3A018660
0014 0 9034           S       PR          DECRE IDLE COUNT BY ONE       3A018670
0015 0 D035           STO     PRDLY                                     3A018680
0016 0 7023           MDX     PRWT3                                     3A018690
0017 0 C0F2           LD      PRINT                                     3A018700
0018 0 D0E7     PRDSW STO     PRGO                                      3A018710
```



```
0019 0 C8EC             LDD     PRRD+2  *A* DC      /3701 SENSE DSW   3A018720
001A 0 18C4     PRSTR RTE       4                                     3A018730
001B 0 D0FD           STO     PRDSW+1 *A* DC      /3480 START PTR   3A018740
001C 0 18D0     PRSTP RTE       16                                    3A018750
001D 0 D0FD           STO     PRSTR+1 *A* DC      /3440 STOP PTR    3A018760
001E 0 F02B     PRFLD EOR       PRDLY-1 *A* DC      /FFFF             3A018770
001F 0 D0FD           STO     PRSTP+1 *A* DC      /FFFF             3A018780
0020 0 C8F2     PRSCN LDD       PRRDS+1                               3A018790
0021 0 18C8           RTE     8                                     3A018800
0022 0 88E0           AD      PRRDS+1                               3A018810
0023 0 D8FA           STD     PRFLD                                 3A018820
0024 0 C0F0           LD      PRRD+1                                3A018830
0025 0 1802           SRA     2                                     3A018840
0026 0 D0DC           STO     PRRDS+1                               3A018850
0027 0 1008           SLA     8                                     3A018860
0028 0 D0DC     PRSPS STO     PRRD+1                                3A018870
0029 0 C01C           LD      PR-3    *A* DC      /3401 SPACE PTR   3A018880
002A 0 1802           SRA     2                                     3A018890
002B 0 D0FD           STO     PRSPS+1                               3A018900
002C 0 08EF     PREND XIO     PRSTP       STOP PRINTER              3A018910
002D 0 C0FC           LD      PRSWS                                 3A018920
002E 0 4804           BSC     E           BIT SW 15 ON              3A018930
002F 0 3002           WAIT    2           * YES, WAIT               3A018940
0030 0 70CF           MDX     PRGO                                  3A018950
001A 0          PRSWS EQU     PRSTR                                 3A018960
0018 0          PREMT EQU     PRDSW                                 3A018970
0031 0 1002     PRSPR SLA     2                                     3A018980
0032 0 4850           BOSC    -           SPACE RESPONSE            3A018990
0033 0 70D7           MDX     PRINT+1     * NO, CHECK DSW AGAIN     3A019000
0034 0 10E0           SLC     32                                    3A019010
0035 0 D8EA           STD     PRSCN       CLEAR                     3A019020
0036 0 D8EB           STD     PRSCN+2       OR SET                  3A019030
0037 0 D8EC           STD     PRSCN+4         SCAN                  3A019040
0038 0 D8ED           STD     PRSCN+6           FIELD               3A019050
0039 0 08E0           XIO     PRSTR       START PRINTER             3A019060
003A 0 3003     PRWT3 WAIT    3           WAIT FOR INTERRUPT        3A019070
003B 0 08C6     PRPRT XIO     PRRDS       READ BIT SWITCHES         3A019080
003C 0 08C7           XIO     PRRD        READ EMITTER              3A019090
003D 0 C0DC           LD      PRSWS       GET SWS                   3A019100
003E 0 E8C9           OR      PRIDL       OR MINIMUM IDLES          3A019110
003F 0 18C8           RTE     8                                     3A019120
0040 0 1008           SLA     8           ISOLATE CHARACTER         3A019130
0041 0 4820           BSC     Z           SKIP IF NO CHAR ENTERED   3A019140
0042 0 F0D5           EOR     PREMT       COMPARE WITH EMITTER      3A019150
0043 0 4820           BSC     Z           SKIP IF SAME CHAR         3A019160
0044 0 70F5           MDX     PRWT3                                 3A019170
0045 0 10C8           SLC     8                                     3A019180
0046 0 D004           STO     PRDLY       SET IDLE COUNT            3A019190
0047 0 C8D6           LDD     PRFLD                                 3A019200
0048 0 70EC           MDX     PRSPR+4                               3A019210
0049 0 0001     PR    DC      /0001                                 3A019220
004A 0 00C0           DC      /00C0                                 3A019230
                ******************************************************* 3A019240
004B 0 0040     PRDLY DC      /0040       THE LAST FIVE WORDS ARE   3A019250
004C 0 9000           DC      /9000       * USED FOR PROGRAM        3A019260
004D 0 2000           DC      /2000       * IDENTIFICATION. THREE   3A019270
004E 0 1000           DC      /1000       * FOR THE PID AND TWO FOR 3A019280
004F 0 0040           DC      /0040       * SEQUENCE.               3A019290
0050   0000           END     0                                     3A019300
  NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY
```

```
CPALT   000D  003E 0042
CPBGN   0000  001C
CPBLD   0012  0000
CPBSW   0002  0018 001A 001D 0021
CPCTL   0009  000E 001B 003C 003F
CPDSV   000B  0022 0024 0028 002E 002F 0032
CPDSW   0006  0002 0004 0015 0017 001E 0023 002D 0039 003B
CPIN4   002C  000C 0031
CPLOP   0036  0038
CPONE   0001  0036
CPRDS   001D  0009
CPRET   0032  002B
CPSEN   0022  000F 0011 0027 0043
CPSET   0008  001F 0033 0040
CPWRT   0004  0012 0014 0029
CRARA   0036  0006 0014 0045
CRBGN   0000  0039
CRBLD   0035  0000 0019 0028 0032
CRBSW   0002  002D 0030 0035 0037
CRDSV   0009  0010
CRDSW   0004  0002 000F 0016 0031 0038 003A 003F
CREND   000A  0022 0047
CRERR   0008  0015 001D 0027
CRIN4   000E  000C 0013
CRLD    0014  001F 0021 0024 0026
CRLOP   002A  001C 002C
CRMOD   001F  0018
CRONE   0001  0020 002A 003C 003E
CRRDR   0006  002E 0040 0042
CRRST   0030  0004 0048
CRSRA   000B  0025 0046
CRSTR   002D  0034
CR080   000D  0043
DCBGN   0000
DCBLD   0020  0000
DCBSW   0008  0019 0022 0023 003C 0040
DCDSW   004C  000C 0011 0028 0045 0048
DCEND   004B  001B 0036
DCINT   000B  000A 0010
DCON1   0004  0026 002A 002E
DCON2   0006  0031
DCON3   000D  0039
DCON5   0002  0020
DCRD    004E  002C 0049
DCSWS   0001  0008 0015 0024 003D
DCWR    0050  0030 0034 0042 0046
DCXR3   0003  0018 001A 0035 003F 0041
DC1     003C  001F
DC3     003E  003A 0044
DC5     0014  001D 0038
DC6     0048  0013
DKBD1   000F  0026
DKBD2   0010  002A
DKBGN   0000  001C
DKBIT   000E  0002 001B 0021 0025 0028 002C 0031 0042
DKBLD   001B  0000
DKBSW   0002  001D 001F 0020 0030
DKCON   0042  001A
DKDSV   000B  0013 0035 0036 003D
DKDSW   0008  0012 0022 0029 0034 0045
DKENT   0001  0017 0037 003F
DKHME   0004  002D 0038
DKIN2   0011  000A 0016
DKMOV   003A  0019 0048
DKRST   0020  000E
DKSEK   0006  002E 0033 003A 003C 0040 0044
DKOFF   000D  0043
DK004   000C  003B
```



```
FPBLD   0033  0000
FPBSW   0006  000D 0013 0019 003F 0041
FPCAR   0004  0008 0011 002F 0036 0038
FPDSW   0002  0015 0018 001F 003B 003D
FPINT   001E  000C 0021
FPOUT   0032  000A 0014
FPPRT   000A  001C 0035 003A 003E 0044
FPRES   0047  0033
FPSKP   0008  002D 0039
FPSTR   000D  0047
FPSWS   0001  0006 000E 000F 0016 0027
FP001   0031  0045
FP1     0013  0026
FP2     0017  001B 0042 0046
FP8     002F  002C 002E
KYBGN   0000  0031
KYBLD   0024  0000
KYBSW   0002  0012 0024 0026 0036
KYDCH   000D  0021
KYDSP   0022  0010
KYDSV   000B  0014
KYDSW   0004  0002 0013 001E 0027 0029 0030 0037
KYIN4   0011  000C 003A 003D
KYKEY   000A  0008 000D 000F 0022 0035 003B
KYONE   0001
KYRD    0008  001C 002D 002F
KYRDW   001C  0018
KYREQ   0019  0017
KYRST   0032  0004
KYSEL   0006  001D 002A 002C 0033
KYSET   0036  001B 0023
PHBLD   0037  0000
PHBSW   0004  0016 0018 0027 003E 0040
PHCTR   0002  0017 0019 0026
PHDSW   000A  0012 001E 0041 0043
PHFED   0000  0030 003C 003D
PHINT   0011  0008 000C 0024
PHK50   000E  001A
PHPCH   0006  0020 0044 0046
PHPST   0008  0031 0039 003B
PHRES   004A  0037
PHSTK   000C  0033 0047 0049
PHSWS   0003  0006 001D 001F 0028 0034
PH1     000F  004A
PH2     0030  0010 0036
PH4     0020  001C
PH6     0022  0015
PH8     0033  002D
PLALT   0048  0045
PLBGN   0000  001D
PLBLD   0012  0000
PLBSW   0002  0019 001B 001E 0022
PLCTL   0013  0043 0046 0049
PLDSV   0009  000E 002C 002F 0032 0035
PLDSW   0006  0002 0004 000D 0015 0018 001F 0023 0027 002D 003B 0042
PLIN3   000C  000B 0010
PLLOP   0038  003A
PLONE   0001  0017 0038
PLOT    0004  0012 0014 0033
PLRDS   001E  0008
PLRET   0035  0011
PLRST   0008  001C
PLSEN   002C  0031 004A
PLSET   000A  0020 0036
PLSTR   0022  0026 002B 0040 0047
PR      0049  0014 0029
PRDLY   004B  0011 0015 001E 0046
PRDSW   0018  0000 000B 001B
```

```
PREMT   0018  0004 0042
PREND   002C  0010
PRFLD   001E  0023 0047
PRGO    0000  0018 0030
PRIDL   0008  003E
PRINT   000A  0009 0017 0033
PRPRT   003B  0013
PRRD    0004  0019 0024 0028 003C
PRRDS   0002  0020 0022 0026 003B
PRSCN   0020  000E 0035 0036 0037 0038
PRSPR   0031  000D 0048
PRSPS   0028  002B
PRSTP   001C  001F 002C
PRSTR   001A  001D 0039
PRSWS   001A  0002 002D 003D
PRWT3   003A  0016 0044
RDARA   0001  0004 0018 001B 0032
RDBGN   0000  002C
RDBLD   001F  0000 002F 003C 0044
RDBSW   0002  001F 0021 002D 0035
RDCOP   0038  0013
RDDSV   000B  0011 003B 0048
RDDSW   0006  0002 0010 0015 0022 0024 002B 002E
RDERR   000A  001C
RDESW   0020  001D 0034 0041
RDINT   0037  001A 001E 0047
RDIO4   000F  0008 000C 003A
RDLOP   003E  0040
RDONE   000E  003E
RDRGO   0008  0025 0027 0036
RDRRD   0004  0014 0028 002A
RDRST   002D  0006 0043 004A
RDOFF   000D  0031
STGBD   003F  0009
STGCR   0004  0015 0022 0023
STGHL   0005  0011 001A 0030 003A
STGLC   0002  0024 0034 0036
STGPG   003E  0037 003E
STGPN   0003  000E 001F 0025 002D
STGRD   0006  000F 0014 0017 0029 002C 0035 0041 0043
STGRS   0048
STGSP   0049  003F
STGST   0009  0000 0040 0048 0049
STGSW   0001  0010 0018
STGXX   0008  000B 000D 0049
STG0    0023  0020 003D
STG1    0025  0039
STG10   003A  0033
STG2    0026  0044 0046
STG3    002A  0047
STG7    0021  001D
TPALT   002B  0045
TPBGN   0000  001B
TPBLD   000D  0000
TPBSW   0002  0014 0016 001C 0026
TPCTL   0009  001A 002C 003F 0046
TPDSV   000B  002E 002F 0034 0036
TPDSW   0006  0002 0004 0010 0013 001D 0021 0028 002A 002D 0035 0042 0044
TPIN4   0033  000C 0039
TPLOP   003C  003E
TPNOT   0046  0041
TPONE   0001  0012 0017 003C
TPPAT   0028  0025
TPRDS   001C  0009 004A
TPRET   003A  0032
TPSEN   002D  0027
TPSET   0008  001E 0022 003A 0047
TPWRT   0004  000D 000F 0030
```



```
TP100   000A  0019 0029
TRADV   000A  0029 002C 0041
TRALT   003F  0047 004A
TRARA   0024  0008 000E 0018 001A
TRBGN   0000  002E
TRBLD   0021  0000 0015 001B 0031 0035
TRBSW   0010  0021 0023 002F 0039
TRCTL   0026  003A 003D 0044
TRDSV   0025  0003
TRDSW   000C  0002 001D 0024 0026
TRIN4   0001  0006 002D
TRI4A   0012  0009
TRLOP   001D  0014 0017 001F
TRNOT   0043  003C
TRPAT   0048  0038
TRRD    000E  0007 002B
TRRST   002F  0001
TRSBW   0023  0010 0012 0030 0034 003E 0040 0045 0048
TRSTR   0035  0020
TR100   0022  0028 0049
END OF ASSEMBLY
```

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CORE STORAGE FUNCTION TEST

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CORE STORAGE FUNCTION TEST

1. PURPOSE

THE CORE TEST TESTS THE CORES, CORE READ/WRITE CIRCUITRY, AND THE CORE-ADDRESSING CIRCUITRY OF THE 1131 CENTRAL PROCESSING UNIT (CPU. THE TEST CONSISTS OF THREE PARTS, WHICH ARE LOADED AND EXECUTED IN THE FOLLOWING ORDER,

A. HIGH-CORE TEST. TESTS MEMORY LOCATIONS ABOVE 2048.

B. 0-THROUGH-9-TEST, TESTS THE THREE HIGHEST LOCATIONS OF CORE IN ADDITION TO LOCATIONS 0-9 IN ORDER TO TEST THE WRAP-AROUND FEATURE OF CORE.

C. LOW-CORE TEST. TESTS CORE LOCATIONS 9 THROUGH 2047.

2. PREREQUISITES

THE CORE TEST DECK MUST BE PRECEDED BY THE 1130 BASIC DIAGNOSTIC LOADER IN ORDER TO BE LOADED. EQUIPMENT REQUIRED CONSISTS OF THE 1442 CARD READ/PUNCH OR PAPER TAPE READER, AND 1131 CPU.

3. USE PROCEDURE

3.1 PROGRAM LOADING

1. PLACE CARDS/PAPER TAPE IN READER.
2. MAKE READER READY.
3. PRESS THE 1131 RESET KEY.
4. PRESS THE 1131 PROGRAM LOAD KEY.
5. IF PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW LOCATION 0120; REFER TO BASIC LOADER DOCUMENTATION SECT. 3.2.

3.2 OPERATION PROCEDURE

A. HIGH CORE TEST WILL LOAD AND RUN FOR ABOUT 2 TO 10 MINUTES, DEPENDING ON CORE SIZE. IF NO ERRORS OCCUR, AND CONSOLE ENTRY SWITCHES 13, 14 AND 15 ARE OFF, THE NEXT TEST SECTION WILL BE AUTOMATICALLY LOADED.

B. 0-9 CORE TEST WILL LOAD, AND RUN BRIEFLY. IF NO ERRORS OCCUR, AND CONSOLE ENTRY SWITCHES 13, 14 AND 15 ARE OFF, THE NEXT TEST SECTION WILL BE AUTOMATICALLY LOADED.

C. LO CORE TEST WILL LOAD AND RUN ABOUT 1 MINUTE, THEN STOP AT END OF TEST WAIT, 30FF, WITH C9CD IN INSTRUCTION ADDRESS REGISTER.

D. ERRORS ARE INDICATED BY ERROR WAITS. SEE PARAGRAPH 3.5

E. PROGRAM OPTIONS MAY BE ENTERED IN CONSOLE ENTRY SWITCHES AT ANY TIME. SEE TABLE 1.

CORE STORAGE FUNCTION TEST

TABLE 1. PROGRAM OPTIONS

DATA ENTRY SWITCHES	HIGH CORE	0-9 CORE	LOW CORE	
SW 15 ON	X	X		WAIT AT END OF TEST SECTION. TO RERUN SECTION PUSH PROG START.
SW 15 OFF	X	X		LOAD AND EXECUTE NEXT TEST SECTION.
SW 14 ON	X	X	X	LOOP TEST SECTION NOW RUNNING.
SW 13 ON	X	X	X	LOOP ROUTINE NOW RUNNING.
SW 12 ON	X	X	X	BYPASS ERROR WAIT.
SW 11 ON	X	X	X	LOOP ON A PARTICULAR ADDRESS. USED FOR SCOPING

3.3 PROGRAM TERMINATION

IN NORMAL OPERATION, THE PROGRAM WILL TERMINATE AFTER ALL THREE PARTS HAVE BEEN EXECUTED, UNLESS CONSOLE ENTRY SWITCH 13, OR 14 IS ON (LOOP ROUTINE, LOOP PROGRAM). TURN OFF SWITCH TO ALLOW PROGRAM TO TERMINATE.

3.4 NORMAL WAITS

IAR	ADDR	SBR	MEANING
0319	0318	3000	WAIT AT END OF TEST SECTION - SW 15 ON.
01FC	01FB	3000	
09CC	09CC	30FF	END OF PROGRAM WAIT - ALL SECTIONS COMPLETE.

3.5 ERROR WAITS

IAR	SBR	MEANING
0392	3000	ERROR IN HIGH-CORE TEST. A. THE ACCUMULATOR WILL DISPLAY THE SAME INFORMATION AS IT DID WHEN THE ERROR WAS DETECTED. B. THE ACCUMULATOR EXTENSION WILL DISPLAY THE CONTENTS OF THE INSTRUCTION ADDRESS REGISTER AT THE TIME THE ERROR WAS DETECTED. C. THE STATUS OF CARRY AND OVERFLOW WILL BE RESTORED. D. INDEX REGISTER XR1 WILL CONTAIN THE ADDRESS THAT FAILED UNDER TEST. E. INDEX REGISTER XR2 WILL CONTAIN THE CORRECT BIT PATTERN, IF THIS WAS AN ERROR-3 CONDITION.
021D	3XXX	ERROR IN 0-9 TEST. A. THE ACCUMULATOR WILL DISPLAY THE SAME INFORMATION AS IT DID WHEN THE ERROR WAS DETECTED. B. THE ACCUMULATOR EXTENSION WILL DISPLAY THE ADDRESS OF THE BSI L RSCOR INSTRUCTION THAT TRANSFERRED THE PROGRAM TO THE ERROR ROUTINE. C. THE STATUS OF CARRY AND OVERFLOW HAVE NO SIGNIFICANCE D. THE 11 LEAST SIGNIFICANT BITS OF THE VALUE OF THE ADDRESS UNDER TEST WILL BE STORED IN THE 11 LEAST SIGNIFICANT BIT POSITIONS OF THE ERROR WAIT. THIS WILL BE DISPLAYED IN THE STORAGE BUFFER REGISTER.

CORE STORAGE FUNCTION TEST

0A46	3000	ERROR IN LOW-CORE TEST. A. THE ACCUMULATOR WILL DISPLAY THE SAME INFORMATION AS IT DID WHEN THE ERROR WAS DETECTED. B. THE ACCUMULATOR EXTENSION WILL DISPLAY THE CONTENTS OF THE INSTRUCTION ADDRESS REGISTER AT THE TIME THE ERROR WAS DETECTED. C. THE STATUS OF CARRY AND OVERFLOW WILL BE RESTORED. D. INDEX REGISTER XR1 WILL CONTAIN THE ADDRESS THAT FAILED UNDER TEST. E. INDEX REGISTER XR2 WILL CONTAIN THE CORRECT BIT PATTERN, IF THIS WAS AN ERROR-3 CONDITION.

IF PROGRAM FAILS TO LOAD, OR IF ERROR WAITS OCCUR AT LOCATIONS BELOW 012C, SEE BASIC LOADER DOCUMENTATION.

4. PRINTOUTS (NONE)

5. COMMENTS

5.1 DESCRIPTION OF HIGH-CORE MEMORY TEST

5.1.1 INITIALIZATIONS (RSDKS)

THE INITIALIZATION ROUTINE ESTABLISHES THE BOOTSTRAP BRANCH, DETERMINES MACHINE TYPE, DETERMINES MEMORY SIZE, AND ESTABLISHES AREA CODES.

5.1.2 READ/WRITE-IN-MEMORY AND ADDRESSING TEST (RSABI)

THE READ/WRITE-IN-MEMORY AND ADDRESSING TEST LOADS EACH CORE POSITION WITH ITS OWN ADDRESS. THE TEST THEN COMPARES THE CONTENTS OF EACH CORE POSITION WITH THE ADDRESS INTERROGATED TO ASSURE THAT THE CORES CAN BE CORRECTLY ADDRESSED.

5.1.3 BIT-ISOLATION TEST (RSABR)

THE BIT-ISOLATION TEST IS IN TWO PARTS. THE FIRST PART CHECKS THE ABILITY TO READ AND WRITE ZEROS IN MEMORY. A FAILURE TO READ OR WRITE ZEROS WILL RESULT IN AN ERROR WAIT. THE SECOND PART IS A BIT-ISOLATION TEST. THIS TEST DETERMINES THE ABILITY OF MEMORY TO DISTINGUISH EACH ONE OF THE 16 BITS IN A STORED WORD. THE PATTERN READ INTO MEMORY HAS FIFTEEN 0 BITS AND A SINGLE 1 BIT IN EACH WORD. FIRST THE 1 BIT IS PLACED IN POSITION 0. THE BIT IS THEN MOVED TO THE RIGHT ONE POSITION PER PASS FOR A TOTAL 15 TIMES UNTIL THE ENTIRE CORE WORD HAS BEEN TESTED.

5.1.4 WORST-CASE-PATTERN TEST (RSACJ)

THE WORST-CASE-PATTERN TEST ESTABLISHES A WORST-CASE PATTERN CONSISTING OF BLOCKS OF WORDS CONTAINING EITHER ALL ONES OR ALL ZEROS. THIS PATTERN IS READ AND STORED INTO MEMORY AND IS THEN COMPLEMENTED AND STORED AGAIN. IF ANY BITS ARE OMITTED OR ADDED, BECAUSE OF THIS WORST-CASE(MAXIMUM NOISE) EXERCISE, AN ERROR WILL OCCUR.

5.1.5 COMMON-PROGRAM/PROGRAM-END ROUTINE (RSADA)

THIS ROUTINE CONTAINS THE PROGRAM-PASS COUNTER AND THE INSTRUCTIONS NECESSARY TO SENSE CONSOLE ENTRY SWITCHES 14 AND 15. WITH SWITCH 15 ON, A WAIT-AT-RSQAS INSTRUCTION SIGNIFIES PROGRAM END.

5.1.6 ERROR ROUTINE TO SERVICE NON-INTERRUPT ERRORS (RSDDD)

THIS ROUTINE PROCESSES AND IDENTIFIES THE ERRORS THAT ARE DETECTED BY THE PROGRAM'S TEST ROUTINES. AN ERROR WAIT IS EXECUTED. SEE SECTION 3.5, ERROR WAITS.

5.1.7 PROPER CONDITION OF SWITCHES

WITH CONSOLE ENTRY SWITCH 12 OFF (NORMAL), EACH ROUTINE IS EXECUTED FOUR TIMES PER EACH PROGRAM PASS, AND THE PROGRAM IS REPEATED THREE TIMES. THIS RESULTS IN A RUN TIME OF BETWEEN 1 AND 10 MINUTES DEPENDING ON MEMORY SPEED AND CORE SIZE.

5.2 DESCRIPTION OF MEMORY TEST (0 THROUGH 9 CORES)

5.2.1 INITIALIZATIONS (RSSTA)

THE INITIALIZATIONS DETERMINE THE MACHINE TYPE, ESTABLISH THE MEMORY SIZE, AND ESTABLISH PROPER IOCC AREA-CODE MODIFIERS.

5.2.2 LOAD-ZEROS-IN-CORES TEST (RSR01)

THIS TEST TESTS THE ABILITY OF THE MEMORY TO READ AND WRITE ALL ZEROS.

5.2.3 LOAD-ONES-IN-CORES TEST (RSR02)

THIS TEST TESTS THE ABILITY OF THE MEMORY TO READ AND WRITE ALL ONES.

5.2.4 ADDRESSING TEST (RSR03)

THIS TEST ATTEMPTS TO PLACE WITHIN EACH MEMORY WORD ITS OWN ADDRESS. THE MEMORY IS THEN READ TO ASSURE THAT PROPER ADDRESSING HAS TAKEN PLACE.

5.2.5 BIT-ISOLATION TEST (RSR04)

THIS TEST CHECKS BIT ISOLATION BY RIPPLING A 1 BIT THROUGH EACH BIT POSITION WITHIN THE MEMORY WORD. AT ANY TIME DURING THIS ROUTINE, THE WORD UNDER TEST SHOULD CONTAIN NO MORE THAN ONE 1 BIT IN ANY WORD.

5.2.6 PROGRAM-END ROUTINE (RSPER)

THIS ROUTINE INCREMENTS THE PROGRAM PASS COUNTER AND INTERROGATES CONSOLE ENTRY SWITCHES 14 AND 15.

5.2.7 ERROR ROUTINE (RSEOR)

THE ERROR ROUTINE IS USED WHENEVER AN ERROR OCCURS. THE ERROR ROUTINE EXECUTES A WAIT-AT-RSERW INSTRUCTION.

NOTE
THIS PART OF THE TEST DOES NOT HAVE THE BOOTSTRAP-BRANCH FEATURE. THE EXECUTION TIME FOR THIS PART OF THE TEST WILL BE LESS THAN 10 SECONDS IF NO ERRORS ARE DETECTED.

5.3 DESCRIPTION OF LOW-CORE MEMORY TEST

5.3.1 INITIALIZATIONS (RSDKS)

THE INITIALIZATIONS DETERMINE MACHINE TYPE AND ESTABLISH AREA CODES.

5.3.2 READ/WRITE-IN-MEMORY ADDRESSING TEST (RSABI)

THIS TEST LOADS EACH CORE POSITION WITH ITS OWN ADDRESS AND COMPARES THE CONTENTS OF EACH CORE POSITION WITH THE ADDRESS INTERROGATED TO ASSURE THAT THE CORES CAN BE CORRECTLY ADDRESSED.

5.3.3 BIT-ISOLATION TEST

THIS TEST DETERMINES THE ABILITY OF MEMORY TO DISTINGUISH EACH ONE OF THE 16 BITS IN A STORED WORD. FIRST THE 1 BIT IS PLACED IN POSITION ZERO. THEN, THE BIT MOVED TO THE RIGHT ONE POSITION PER PASS FOR A TOTAL 15 PASSES UNTIL THE ENTIRE CORE WORD HAS BEEN TESTED.

5.3.4 WORST-CASE-PATTERN TEST (RSACJ)

THE WORST-CASE-PATTERN TEST ESTABLISHES A WORST-CASE PATTERN CONSISTING OF BLOCKS OF WORDS CONTAINING EITHER ALL ONES OR ALL ZEROS. THIS PATTERN IS READ AND STORED INTO MEMORY AND IS THEN COMPLEMENTED AND STORED AGAIN. IF ANY BITS ARE DROPPED OR ADDED DURING THIS WORST-CASE (MAXIMUM NOISE) EXERCISE, AN ERROR WAIT WILL OCCUR.

5.3.5 COMMON-PROGRAM/PROGRAM-END ROUTINE (RSADA)

THIS ROUTINE CONTAINS THE PROGRAM-PASS COUNTER AND INTERROGATES CONSOLE ENTRY SWITCH 14. A WAIT-AT-RSEXI INSTRUCTION SIGNIFIES PROGRAM END.

5.3.6 ERROR ROUTINE TO SERVICE NON-INTERRUPT ERRORS (RSDDD)

THIS ROUTINE PROCESSES AND IDENTIFIES THE ERRORS THAT ARE DETECTED BY THE PROGRAM'S TESTS. AN ERROR WAIT INSTRUCTION IS EXECUTED.

NOTE
AFTER THIS PART OF THE TEST HAS COMPLETED ITS INITIALIZATION ON THE FIRST PASS, A BOOTSTRAP BRANCH IS AVAILABLE FOR RESTARTING THE PROGRAM. THIS BOOTSTRAP BRANCH IS INITIATED BY DEPRESSING THE STOP, RESET, AND START PUSHBUTTONS AND WILL RESULT IN A BRANCH TO THE START OF THE PROGRAM. EACH ROUTINE IS EXECUTED FOUR TIMES FOR EACH PROGRAM PASS AND THE PROGRAM IS REPEATED THREE TIMES. THIS RESULTS IN A RUN TIME OF BETWEEN ONE AND TWO MINUTES DEPENDING ON MEMORY SPEED. THE PROGRAM DESTROYS THE 1130 BASIC DIAGNOSTIC LOADER, MAKING IT IMPOSSIBLE TO CHAIN TO ANOTHER PROGRAM.

CORE STORAGE FUNCTION TEST
HIGH CORE TEST

```
                        *                                                       HCT00000
                        *                                                       HCT00010
                        *                                                       HCT00020
                        *                                                       HCT00030
                        *  MEMORY TEST-HIGH CORE                                HCT00040
                        *                                                       HCT00050
                        *                                                       HCT00060
                              ABS                                               HCT00070
028C                          ORG     300                                       HCT00080
012C 0  C839            RSDKR LDD     RSAAN                                     HCT00090
012D 00 DC000000              STD   L 0                                         HCT00100
012F 0  C834            RSDKS LDD     RSAAM                                     HCT00110
0130 00 DC000004              STD   L 4                                         HCT00120
0132 0  C015                  LD      RSAAE     CLEAR Q REGISTER                HCT00130
0133 0  1890                  SRT     16                                        HCT00140
0134 0  C018                  LD      RSFAC     INITIALIZE MEM SIZE             HCT00150
0135 0  D013                  STO     RSAAH                                     HCT00160
                        *                                                       HCT00170
                        *  MACHINE DETERMINATION ROUTINE                        HCT00180
                        *                                                       HCT00190
0136 0  C011                  LD      RSAAE                                     HCT00200
0137 00 D4000003              STO   L 3                                         HCT00210
0139 00 6700FFFF              LDX   L3 /FFFF                                    HCT00220
013B 00 C4000003              LD    L 3                                         HCT00230
013D 00 4C200141              BSC   L RSAAB,Z                                   HCT00240
013F 0  C007                  LD      RSAAD                                     HCT00250
0140 0  7001                  MDX   X 1                                         HCT00260
0141 0  C004            RSAAB LD      RSAAC                                     HCT00270
0142 0  D007                  STO     RSAAK                                     HCT00280
0143 00 67000000              LDX   L3 /0000    CLEAR XR 3                      HCT00290
0145 0  7008                  MDX     RSAAF                                     HCT00300
                        *                                                       HCT00310
                        *  STORAGE AREAS FOR INITIALIZATIONS                    HCT00320
                        *                                                       HCT00330
0146 0  0001            RSAAC DC      1         1130 CONSTANT                   HCT00340
0147 0  FFFE            RSAAD DC      -2        1800 CONSTANT                   HCT00350
0148 0  0000            RSAAE DC      0         CONSTANT ZERO                   HCT00360
0149 0  0800            RSAAH DC      /0800     MEMORY SIZE                     HCT00370
014A 0  0000            RSAAK DC      0         MACHINE TYPE                    HCT00380
014B 0  0003            RSFAA DC      3         NUMBER OF PROGRAM PA SES        HCT00390
014C 0  0000            RSFAB DC      0         PROGRAM PASS BUFFER             HCT00400
014D 0  0800            RSFAC DC      /0800     INITIALIZE MEM SIZE             HCT00410
                        *                                                       HCT00420
                        *  MEMORY SIZE ROUTINE                                  HCT00430
                        *                                                       HCT00440
014E 0  C0F9            RSAAF LD      RSAAE                                     HCT00450
014F 00 D4000000              STO   L 0                                         HCT00460
0151 0  C0F7                  LD      RSAAH                                     HCT00470
0152 0  0001            RSAAJ STO     RSAAG+1                                   HCT00480
0153 00 D4000149        RSAAG STO   L RSAAH                                     HCT00490
0155 00 C4000000              LD    L 0                                         HCT00500
0157 00 4C18015C              BSC   L RSAAI,+-                                  HCT00510
0159 0  90EC                  S       RSAAC                                     HCT00520
015A 0  D0EE                  STO     RSAAH                                     HCT00530
015B 0  7015                  MDX     RSABA                                     HCT00540
015C 0  C0EC            RSAAI LD      RSAAH                                     HCT00550
015D 0  1001                  SLA     1                                         HCT00560
015E 0  D0EA                  STO     RSAAH                                     HCT00570
015F 0  70F2                  MDX     RSAAJ                                     HCT00580
                        *                                                       HCT00590
                        *  STORAGE AREAS PART 1                                 HCT00600
                        *                                                       HCT00610
0160 0  7003            RSAAL MDX   X 3                                         HCT00620
0162    0002                  BSS   E 2                                         HCT00630
0164 00 4C00012F        RSAAM BSC   L RSDKS     BOOTSTRAP BRANCH INST           HCT00640
0166 00 4C00012F        RSAAN BSC   L RSDKS                                     HCT00650
0168 0  016E            RSQAF DC      RSQAL     READ BIT SWITCH IOCC            HCT00660
0169 0  3A40            RSQAO DC      /3A40     SECOND HALF IOCC-113            HCT00670
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CORE STORAGE FUNCTION TEST
HIGH CORE TEST

```
016A 0  0480            RSQAC DC      RSEND+2   END OF PROGRAM IN CORE          HCT00680
016B 0  031D            RSQAD DC      RSCCA     INTERRUPT LEVEL ZERO VECT       HCT00690
016C 0  0000            RSQAE DC      0         WORK AREA                       HCT00700
016D 0  0240            RSQAP DC      /0240     SECOND HALF IOCC-180            HCT00710
016E 0  0000            RSQAL DC      0         BIT SWITCH BUFFER AREA          HCT00720
016F 0  0F03            RSQAU DC      /0F03     2ND HALF IOCC-1800 D W          HCT00730
0170 0  0902            RSQAV DC      /0902     2ND HALF-1800 TYPE              HCT00740
                        *                                                       HCT00750
                        *  INITIALIZE MASKS AND INTERRUPTS TO LEVEL ZERO        HCT00760
                        *  1800 ONLY                                            HCT00770
                        *                                                       HCT00780
0171 0  C0EE            RSABA LD      RSAAL     STORE BOOTSTRAP BRAN H AT       HCT00790
0172 00 D4000000              STO   L 0         LOCATION ZERO                   HCT00800
0174 0  C0D5                  LD      RSAAK                                     HCT00810
0175 00 4C040182              BSC   L RSABI,E   IF 1130-GO TO FIRST ROUTI       HCT00820
0177 0  C0F5                  LD      RSQAP     CHANGE SECOND HALF I CC         HCT00830
0178 0  D0F0                  STO     RSQAO     FOR 1800 READ BIT SW            HCT00840
0179 0  C0F1                  LD      RSQAD     INTERRUPT LEVEL ERRO  VECT      HCT00850
017A 00 D4000008              STO   L 8                                         HCT00860
017C 0  C0F2                  LD      RSQAU     DSW 1800                        HCT00870
017D 00 D40003F7              STO   L TWSNS+1                       PRO1      HCT00880
017F 0  C0F9                  LD      RSQAV     XIO WRITE 1800                  HCT00890
0180 00 D40003F9              STO   L TWWRT+1                       PRO2      HCT00900
                        *                                                       HCT00910
                        *  FIRST ROUTINE-READ + WRITE IN MEMORY                 HCT00920
                        *                                                       HCT00930
0182 0  C0C8            RSABI LD      RSFAA     INITIALIZE PROGRAM              HCT00940
0183 0  D0C8                  STO     RSFAB     PASS COUNTER                    HCT00950
0184 0  6204            RSABH LDX   X2 4        ADDRESSING PASSES               HCT00960
0185 00 6580016A        RSABB LDX   I1 RSQAC                                    HCT00970
0187 0  69E4            RSABC STX     1 RSQAE                                   HCT00980
0188 0  C0E3                  LD      RSQAE                                     HCT00990
0189 00 D480016C              STO   I RSQAE                                     HCT01000
018B 0  F0BD                  EOR     RSAAH                                     HCT01010
018C 00 4C180190              BSC   L RSABD,+-                                  HCT01020
018E 0  7101                  MDX   X1 1        INCR TO NEXT ADDRESS            HCT01030
018F 0  70F7                  MDX     RSABC                                     HCT01040
0190 00 6580016A        RSABD LDX   I1 RSQAC                                    HCT01050
0192 0  69D9            RSABE STX     1 RSQAE                                   HCT01060
0193 00 C480016C              LD    I RSQAE                                     HCT01070
0195 0  F0D6                  EOR     RSQAE                                     HCT01080
0196 00 4C1801A5              BSC   L RSABF,+-  ERROR 1 DETECTED                HCT01090
0198 00 D400021F              STO   L RSQAN     STORE ACCUM FOR ERROR ROU       HCT01100
019A 00 0C000168              XIO   L RSQAF                                     HCT01110
019C 00 C400016E              LD    L RSQAL                                     HCT01120
019E 00 E400028C              AND   L RSRAI                                     HCT01130
01A0 00 4C200192              BSC   L RSABE,Z                                   HCT01140
01A2 00 4400037E              BSI   L RSDDD                                     HCT01150
01A4 0  FFFE                  DC      /FFFE     ERROR 1 CONSTANT                HCT01160
01A5 0  08C2            RSABF XIO     RSQAF     READ BIT SWITCHES               HCT01170
01A6 00 C400016E              LD    L RSQAL                                     HCT01180
01A8 00 E400028C              AND   L RSRAI     ISOLATE BIT SW 11               HCT01190
01AA 00 4C200192              BSC   L RSABE,Z   IF BIT SW 11 ON-REPEAT AD       HCT01200
01AC 0  C0BF                  LD      RSQAE                                     HCT01210
01AD 0  F09B                  EOR     RSAAH                                     HCT01220
01AE 00 4C1801B2              BSC   L RSABG,+-                                  HCT01230
01B0 0  7101                  MDX   X1 1        INCR TO NEXT ADDRESS            HCT01240
01B1 0  70E0                  MDX     RSABE                                     HCT01250
01B2 0  72FF            RSABG MDX   X2 -1       COUNT PASSES                    HCT01260
01B3 0  70D1                  MDX     RSABB                                     HCT01270
01B4 00 0C000168              XIO   L RSQAF       REPEAT ROUTINE IF SW13 ON     HCT01280
01B6 00 C400016E              LD    L RSQAL                                     HCT01290
01B8 00 E400028A              AND   L RSRAG                                     HCT01300
01BA 00 4C200184              BSC   L RSAEH,Z   REPEAT ADDRESSING RO TINE       HCT01310
                        *                                                       HCT01320
                        *  SECOND ROUTINE                                       HCT01330
                        *  BIT ISOLATION TEST-BIT BY BIT-ADRESS BY ADDRESS      HCT01340
                        *                                                       HCT01350
```

```
01BC 0  6304       RSABR LDX  X3 4          BIT ISOLATION PASSES       HCT01360
01BD 00 C400016A   RSABP LD   L  RSQAC                                 HCT01370
01BF 0  D05A       RSABN STO     RSQAH                                 HCT01380
01C0 00 6580021A         LDX  I1 RSQAH                                 HCT01390
01C2 0  C058             LD    RSQAI                                  HCT01400
01C3 00 D480021A         STO  I  RSQAH                                 HCT01410
01C5 00 C480021A         LD   I  RSQAH                                 HCT01420
01C7 00 4C130106         BSC  L  RSABJ,+-   ERROR 2 DETECTED           HCT01430
01C9 00 4400037E         BSI  L  RSDDD                                 HCT01440
01CB 0  FFED             DC      /FFED      ERROR 2 CONSTANT           HCT01441
01CC 00 D400021F         STO  L  RSQAN      STORE ACC FOR ERROR  OUTI  HCT01450
01CE 00 0C000168         XIO  L  RSQAF                                 HCT01460
01D0 00 C400016E         LD   L  RSQAL                                 HCT01470
01D2 00 E400028C         AND  L  RSRAI                                 HCT01480
01D4 00 4C2001C0         BSC  L  RSABN+1,Z                             HCT01490
01D6 00 0C000168   RSABJ XIO  L  RSQAF      IF BIT SW 11 ON REPE T AD  HCT01510
01D8 00 C400016E         LD   L  RSQAL                                 HCT01520
01DA 00 E400028C         AND  L  RSRAI                                 HCT01530
01DC 00 4C2001C0         BSC  L  RSABN+1,Z                             HCT01540
01DE 0  C03D             LD      RSQAJ                                 HCT01550
01DF 0  D03D             STO     RSQAK                                 HCT01560
01E0 0  C03C       RSABL LD      RSQAK                                 HCT01570
01E1 00 D480021A   RSABQ STO  I  RSQAH                                 HCT01580
01E3 00 6680021D         LDX  I2 RSQAK                                 HCT01590
01E5 00 C480021A         LD   I  RSQAH                                 HCT01600
01E7 0  E035             EOR     RSQAK                                 HCT01610
01E8 00 4C1801E7         BSC  L  RSABK,+-   ERROR 3 DETECTED           HCT01620
01EA 00 D400021F         STO  L  RSQAN                                 HCT01630
01EC 00 0C000168         XIO  L  RSQAF                                 HCT01640
01EE 00 C400016E         LD   L  RSQAL                                 HCT01650
01F0 00 E400028C         AND  L  RSRAI                                 HCT01660
01F2 00 4C2001E0         BSC  L  RSABL,Z                               HCT01670
01F4 00 4400037E         BSI  L  RSDDD                                 HCT01680
01F6 0  FFFB             DC      /FFFB      ERROR 3 CONSTANT           HCT01690
01F7 00 0C000168   RSABK XIO  L  RSQAF                                 HCT01700
01F9 00 C400016E         LD   L  RSQAL                                 HCT01710
01FB 00 E400028C         AND  L  RSRAI      ISOLATE BIT 11             HCT01720
01FD 00 4C2001E0         BSC  L  RSABL,Z    IF BIT SW 11 ON-REPE T BI  HCT01730
01FF 0  C01D             LD      RSQAK                                 HCT01740
0200 0  4804             BSC     E          IF ODD-BIT 15 IS REA HED   HCT01750
0201 0  7003             MDX     RSABM      BRANCH TO INCRE ADR ROUTI  HCT01760
0202 0  1801             SRA     1          INCREMENT BIT              HCT01770
0203 0  D019             STO     RSQAK      POSITION BY ONE            HCT01780
0204 0  70DC             MDX     RSABQ                                 HCT01790
0205 0  C014       RSABM LD      RSQAH      TEST FOR MEMORY END        HCT01800
0206 00 F4000149         EOR  L  RSAAH                                 HCT01810
0208 00 4C18020D         BSC  L  RSABO,+-                              HCT01820
020A 0  C00F             LD      RSQAH      INCREMENT TO TEST NE T     HCT01830
020B 0  9012             A       RSQAM      MEMORY LOCATION            HCT01840
020C 0  70B2             MDX     RSABN                                 HCT01850
020D 0  73FF       RSABO MDX  X3 -1         COUNT PASSES               HCT01860
020E 0  70AE             MDX     RSABP                                 HCT01870
020F 00 0C000168         XIO  L  RSQAF                                 HCT01880
0211 00 C400016E         LD   L  RSQAL                                 HCT01890
0213 00 E400028A         AND  L  RSRAG                                 HCT01900
0215 00 4C2001BC         BSC  L  RSABR,Z    REPEAT BIT ISOLATION       HCT01910
0217 0  7008             MDX     RSACJ                                 HCT01920
                   *                                                   HCT01930
                   *  STORAGE AREAS PART 2                             HCT01940
                   *                                                   HCT01950
0218 0  0004       RSQAQ DC      4          WORST CASE PASSES          HCT01960
0219 0  0000       RSQAR DC      0          WORST CASE PASS COUN       HCT01970
021A 0  0000       RSQAH DC      0          WORK AREA-ADR              HCT01980
021B 0  0000       RSQAI DC      0          CONST ZERO                 HCT01990
021C 0  8000       RSQAJ DC      /8000      BIT ZERO CONSTANT          HCT02000
021D 0  0000       RSQAK DC      0          WORK AREA-BIT              HCT02010
021E 0  0001       RSQAM DC      1          CONST 1                    HCT02020
021F 0  0000       RSQAN DC      0          STORAGE FOR ACCUM          HCT02030
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                   *                                                   HCT02040
                   *  ESTABLISH WORST CASE PATTERN                     HCT02050
                   *                                                   HCT02060
0220 00 66000000   RSACJ LDX  L2 /0000                                 HCT02070
0222 00 6700FFFF         LDX  L3 /FFFF                                 HCT02080
0224 0  C0F3             LD      RSQAQ      INITIALIZE WORST CAS       HCT02090
0225 0  D0F3             STO     RSQAR      PASS COUNTER               HCT02100
0226 00 74FF0219   RSACK MDX  L  RSQAR,-1   COUNT WORST CASE PAS ES    HCT02110
0228 0  7001             MDX     RSACX                                 HCT02120
0229 0  7053             MDX     RSACW                                 HCT02130
022A 0  6AEF       RSACX STX    2 RSQAH      COMPLEMENT XR2             HCT02140
022B 0  C0EE             LD      RSQAH                                 HCT02150
022C 00 F4000287         EOR  L  RSRAC                                 HCT02160
022E 0  D0EB             STO     RSQAH                                 HCT02170
022F 00 6680021A         LDX  I2 RSQAH                                 HCT02180
0231 0  6BE8             STX  3  RSQAH      COMPLEMENT XR3             HCT02190
0232 0  C0E7             LD      RSQAH                                 HCT02200
0233 00 F4000287         EOR  L  RSRAC                                 HCT02210
0235 0  D0E4             STO     RSQAH                                 HCT02220
0236 00 6780021A         LDX  I3 RSQAH                                 HCT02230
0238 00 C400016A         LD   L  RSQAC                                 HCT02240
023A 0  D04A             STO     RSRAA                                 HCT02250
023B 0  C049       RSACB LD      RSRAA                                 HCT02260
023C 0  1806             SRA     6                                     HCT02270
023D 0  D048             STO     RSRAB                                 HCT02280
023E 0  1802             SRA     2                                     HCT02290
023F 0  8046             A       RSRAB                                 HCT02300
0240 00 4C040245         BSC  L  RSACA,E                               HCT02310
0242 00 6E800285         STX  I2 RSRAA                                 HCT02320
0244 0  7002             MDX     RSACD                                 HCT02330
0245 00 6F800285   RSACA STX  I3 RSRAA                                 HCT02340
0247 0  C03D       RSACD LD      RSRAA                                 HCT02350
0248 00 F4000149         EOR  L  RSAAH      TEST FOR MEMORY END        HCT02360
024A 00 4C18024F         BSC  L  RSADB,+-                              HCT02370
024C 00 74010285         MDX  L  RSRAA,1    ADR=ADR+1                  HCT02380
024E 0  70EC             MDX     RSACB                                 HCT02390
                   *                                                   HCT02400
                   *  WORST CASE TEST  LOAD AND STORE  THEN            HCT02410
                   *  COMPLEMENT AND REPEAT                            HCT02420
                   *                                                   HCT02430
024F 00 6580016A   RSADB LDX  I1 RSQAC      LOAD STARTING ADR IN XR1   HCT02440
0251 0  6933       RSACL STX    1 RSRAA                                 HCT02450
0252 0  C03B       RSACH LD      RSRAJ      INITIALIZE COMPLEMENT CNTR HCT02460
0253 0  D03B             STO     RSRAK                                 HCT02470
0254 00 C4800285   RSACG LD   I  RSRAA                                 HCT02480
0256 00 4C20025A         BSC  L  RSACE,Z                               HCT02490
0258 0  F02E             EOR     RSRAC                                 HCT02500
0259 0  7010             MDX     RSACF                                 HCT02510
025A 0  F02C       RSACE EOR     RSRAC                                 HCT02520
025B 00 4C18026A         BSC  L  RSACF,+-   ERROR 4 DECTECTED          HCT02530
025D 00 D400021F         STO  L  RSQAN                                 HCT02540
025F 00 0C000168         XIO  L  RSQAF                                 HCT02550
0261 00 C400016E         LD   L  RSQAL                                 HCT02560
0263 00 E400028C         AND  L  RSRAI                                 HCT02570
0265 00 4C200252         BSC  L  RSACH,Z                               HCT02580
0267 00 4400037E         BSI  L  RSDDD                                 HCT02590
0269 0  FFF7             DC      /FFF7      ERROR 4 CONSTANT           HCT02600
026A 00 D4800285   RSACF STO  I  RSRAA                                 HCT02610
026C 00 74FE028F         MDX  L  RSRAK,-2                              HCT02620
026E 0  70E5             MDX     RSACG      BRANCH FOR COMPLEMEM  PAS  HCT02630
026F 00 0C000168         XIO  L  RSQAF                                 HCT02640
0271 00 C400016E         LD   L  RSQAL                                 HCT02650
0273 0  E018             AND     RSRAI      ISOLATE BIT SW 11          HCT02660
0274 00 4C200252         BSC  L  RSACH,Z    IF BIT SW 11 ON-REPE T AD  HCT02670
0276 0  C00E             LD      RSRAA                                 HCT02680
0277 00 F4000149         EOR  L  RSAAH      TEST FOR MEMORY END        HCT02690
0279 00 4C180226         BSC  L  RSACK,+-                              HCT02700
027B 0  7101             MDX  X1 1          MEM ADR=ADR+1              HCT02710
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027C 0  70D4            MDX     RSACL                                   HCT02720
027D 00 0C000168  RSACW XIO  L  RSQAF                                   HCT02730
027F 00 C400016E        LD   L  RSQAL                                   HCT02740
0281 0  E008            AND     RSRAG     LOOP ROUTINE IF SW 1  ON      HCT02750
0282 00 4C200220        BSC  L  RSACJ,Z                                 HCT02760
0284 0  700B            MDX     RSACV                                   HCT02770
                *                                                       HCT02780
                *  STORAGE AREAS PART 3                                 HCT02790
                *                                                       HCT02800
0285 0  0000      RSRAA DC      0         WORK AREA-ADDRESS             HCT02810
0286 0  0000      RSRAB DC      0         BUFFER AREA-WORST CASE PA     HCT02820
0287 0  FFFF      RSRAC DC      /FFFF                                   HCT02830
0288 0  0000      RSRAE DC      0         WORK AREA-ADDRESS             HCT02840
0289 0  0000      RSRAF DC      0         CONST ZERO                    HCT02850
028A 0  0004      RSRAG DC      /0004     BIT 13 ISOLATION CONST        HCT02860
028B 0  0002      RSRAH DC      /0002     BIT 14 ISOLATION CON T        HCT02870
028C 0  0010      RSRAI DC      /0010     BIT 11 ISOLATION CONST        HCT02880
028D 0  0020      RSRAX DC      /0020     BIT 10 ISOLATION CON TANT     HCT02890
028E 0  0003      RSRAJ DC      3                                       HCT02900
028F 0  0000      RSRAK DC      0         COMPLEMENT PASS COUN ER       HCT02910
                *                                                       HCT02920
                *  STORAGE PROTECTION TEST ROUTINES                     HCT02930
                *                                                       HCT02940
0290 00 C400014A  RSACV LD   L  RSAAK                                   HCT02950
0292 00 4C080296        BSC  L  RSACU,+                                 HCT02960
0294 00 64000305        LDX  L  RSADA     NOT 1800 BRANCH TO E D        HCT02970
                *                                                       HCT02980
                *  WRITE ZEROS ON PROTECTED AREA OF ONES                HCT02990
                *                                                       HCT03000
0296 0  6204      RSACU LDX  X2 4         STORAGE PROTECT PASS S        HCT03010
0297 00 C400016A  RSACS LD   L  RSQAC                                   HCT03020
0299 0  D0EE            STO     RSRAE                                   HCT03030
029A 0  D008            STO     RSACO     INITIALIZE STS ADDRESS        HCT03040
0298 00 C4000372        LD   L  RSSAH     TELL INTERRUPT ROUTI E TO     HCT03050
029D 00 D4000371        STO  L  RSSAF     DISREGARD SP ERROR            HCT03060
029F 0  C0E7      RSACN LD      RSRAC     ACC=/FFFF                     HCT03070
02A0 00 04800288        STO  I  RSRAE                                   HCT03080
02A2 0  2C41            DC      /2C41     ADD SP BITS                   HCT03090
02A3 0  04B0      RSACO DC      RSEND+2                                 HCT03100
02A4 00 65800288        LDX  11 RSRAE                                   HCT03110
02A6 0  C0E2            LD      RSRAF     ACCUM=0                       HCT03120
02A7 00 04800288        STO  I  RSRAE     STO SHOULD NOT OCCUR          HCT03130
02A9 00 C4800288        LD   I  RSRAE                                   HCT03140
02AB 0  F0DB            EOR     RSRAC                                   HCT03150
02AC 00 4C18028B        BSC  L  RSACM,+-  ERROR 5 DECTECTED             HCT03160
02AE 00 D400021F        STO  L  RSQAN                                   HCT03170
02B0 00 0C000168        XIO  L  RSQAF                                   HCT03180
02B2 00 C400016E        LD   L  RSQAL                                   HCT03190
02B4 00 E400028C        AND  L  RSRAI                                   HCT03200
02B6 00 4C20029F        BSC  L  RSACN,Z                                 HCT03210
02B8 00 4400037E        BSI  L  RSDDD                                   HCT03220
02BA 0  FFEF            DC      /FFEF     ERROR 5 CONSTANT              HCT03230
02BB 00 0C000168  RSACM XIO  L  RSQAF                                   HCT03240
02BD 00 C400016E        LD   L  RSQAL                                   HCT03250
02BF 0  E0CC            AND     RSRAI     ISOLATE BIT SW 11             HCT03260
02C0 00 4C20029F        BSC  L  RSACN,Z   IF BIT SW 11 ON-REPE T AD     HCT03270
02C2 0  C0C5            LD      RSRAE                                   HCT03280
02C3 00 84C0021E        A    L  RSQAM                                   HCT03290
02C5 0  D0C2            STO     RSRAE                                   HCT03300
02C6 0  D0DC            STO     RSACO                                   HCT03310
02C7 00 F4000149        EOR  L  RSAAH                                   HCT03320
02C9 00 4C20029F        BSC  L  RSACN,Z   RETURN WITH ADR=ADR+          HCT03330
                *                                                       HCT03340
                *  UNPROTECT AND CLEAR MEMORY OF ONES                   HCT03350
                *                                                       HCT03360
02CB 00 C4000372        LD   L  RSSAG     SERVICE STORAGE PROT CT       HCT03370
02CD 00 D4000371        STO  L  RSSAF                                   HCT03380
02CF 00 C400016A        LD   L  RSQAC                                   HCT03390
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02D1 0  D0B6            STO     RSRAE                                   HCT03400
02D2 0  D001            STO     RSACR     INITIALIZE STS ADDRE S        HCT03410
02D3 0  2C40      RSACQ DC      /2C40     CLEAR SP BITS                 HCT03420
02D4 0  04B0      RSACR DC      RSEND+2                                 HCT03430
02D5 00 65800288        LDX  11 RSRAE                                   HCT03440
02D7 0  C0B1            LD      RSRAF     ACC=/0000                     HCT03450
02D8 00 04800288        STO  I  RSRAE                                   HCT03460
02DA 00 C4800288        LD   I  RSRAE                                   HCT03470
02DC 00 4C1802E8        BSC  L  RSACP,+-  ERROR 6 DECTECTED             HCT03480
02DE 00 D400021F        STO  L  RSQAN                                   HCT03490
02E0 00 0C000168        XIO  L  RSQAF                                   HCT03500
02E2 00 C400016E        LD   L  RSQAL                                   HCT03510
02E4 00 E400028C        AND  L  RSRAI                                   HCT03520
02E6 00 4C2002D3        BSC  L  RSACQ,Z                                 HCT03530
02E8 00 4400037E        BSI  L  RSDDD                                   HCT03540
02EA 0  FFDF            DC      /FFDF     ERROR 6 CONSTANT              HCT03550
02EB 00 0C000168  RSACP XIO  L  RSQAF     REPEAT LOOP IF SW 11 ON       HCT03560
02ED 00 C400016E        LD   L  RSQAL                                   HCT03570
02EF 0  E09C            AND     RSRAI                                   HCT03580
02F0 00 4C2002D3        BSC  L  RSACQ,Z   REPEAT ADDRESS                HCT03590
02F2 0  C095            LD      RSRAE                                   HCT03600
02F3 00 8400021E        A    L  RSQAM                                   HCT03610
02F5 0  D092            STO     RSRAE                                   HCT03620
02F6 0  D0DD            STO     RSACR                                   HCT03630
02F7 00 F4000149        EOR  L  RSAAH                                   HCT03640
02F9 00 4C2002D3        BSC  L  RSACQ,Z   BRANCH WITH ADR=ADR+          HCT03650
02FB 0  72FF            MDX  X2 -1                                      HCT03660
02FC 0  709A            MDX     RSACS     LOOP ROUTINE FOR 5 P SSES     HCT03670
02FD 00 0C000168        XIO  L  RSQAF     LOOP ROUTINE IF SW 13 ON      HCT03680
02FF 00 C400016E        LD   L  RSQAL                                   HCT03690
0301 00 E400028A        AND  L  RSRAG                                   HCT03700
0303 00 4C200296        BSC  L  RSACU,Z   REPEAT SP ROUTINE             HCT03710
                *                                                       HCT03720
                *  COMMON PROGRAM END                                   HCT03730
                *                                                       HCT03740
0305 00 74FF014C  RSADA MDX  L  RSFAB,-1                                HCT03750
0307 0  7013            MDX     RSCCQ                                   HCT03760
0308 00 0C000168        XIO  L  RSQAF                                   HCT03770
030A 00 C400016E        LD   L  RSQAL                                   HCT03780
030C 00 E4000288        AND  L  RSRAH                                   HCT03790
030E 00 4C200182        BSC  L  RSABI,Z   REPEAT PROG-SW 14 ON          HCT03800
0310 00 0C000168  RSEXI XIO  L  RSQAF                                   HCT03810
0312 00 C400016E        LD   L  RSQAL                                   HCT03820
0314 00 4C040318        BSC  L  RSQAS,E   INTERROGATE SW 15             HCT03830
0316 00 64000050  RSQAW LDX  L  /0050     LINK TO NEXT PROG             HCT03840
0318 0  3000      RSQAS WAIT              PROGRAM END-PRESS START       HCT03850
0319 00 6400012F        LDX  L  RSDKS     TO RE-RUN PROGRAM             HCT03860
031B 00 64000184  RSCCQ LDX  L  RSABH     LOOP PROGRAM                  HCT03870
                *                                                       HCT03880
                *  INTERRUPT LEVEL ERROR ROUTINE                        HCT03890
                *                                                       HCT03900
031D 0  0000      RSCCA DC      0         RETURN ADDR TO MAIN LINE      HCT03910
031E 0  D04C            STO     RSSAA     SAVE A                        HCT03920
031F 0  2847            STS     RSCCE     STORE STATUS CARY+OFLO        HCT03930
0320 0  084D            XIO     RSSAC     SENSE ILSW FOR LEVEL ERROR    HCT03940
0321 0  D04E            STO     RSSAD                                   HCT03950
0322 00 4C400324        BOSC L  NEXT                                    HCT03960
0324 00 0C000168  NEXT  XIO  L  RSQAF     TEST FOR THE ILLEGAL          HCT03970
0326 00 C400016E        LD   L  RSQAL     SWITCH COMBINATION-S  10       HCT03980
0328 0  E052            AND     RSSAO     ON AND SW 12 OFF              HCT03990
0329 0  F052            EOR     RSSAP                                   HCT04000
032A 00 4C180394        BSC  L  RSDDK,+-  BRANCH IF ILLEGAL             HCT04010
032C 0  C043            LD      RSSAD     RESTORE STATUS OF IL W        HCT04020
032D 0  E046            AND     RSSAE     ISOLATE STGE PRT ERROR        HCT04030
032E 00 4C180343        BSC  L  RSCCB,+-  TEST FOR STORAGE PRO  VIOL     HCT04040
0330 0  C040            LD      RSSAF                                   HCT04050
0331 00 4C10033F        BSC  L  RSCCG,-   BYPASS PRINTOUT IF I  SP       HCT04060
0333 00 0C000168        XIO  L  RSQAF     SW 10 TO BYPASS PRINTOUT      HCT04070
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0335 00 C400016E          LD   L  RSQAL                                  HCT04080
0337 00 E400028D          AND  L  RSRAX                                  HCT04090
0339 00 4C200359          BSC  L  RSCCD,Z     BYPASS PRINTOUT IF B ANCH  HCT04100
033B 00 44000397          BSI  L  LOG                                    HCT04110
033D 0  0473              DC      MES03       ERROR INT-STORG PROT       HCT04120
033E 0  7004              MDX     RSCCB                                  HCT04130
033F 0  C030        RSCCG LD      RSSAD       IF IN SP ROUTINE AN  P     HCT04140
0340 0  F033              EOR     RSSAE       ERROR ONLY THEN RETURN TO  HCT04150
0341 00 4C98031D          BSC  I  RSCCA,+-    MAINLINE                   HCT04160
0343 00 0C000168    RSCCB XIO  L  RSQAF       SW 10 TO BYPASS PRINTOUT   HCT04170
0345 00 C400016E          LD   L  RSQAL                                  HCT04180
0347 00 E400028D          AND  L  RSRAX                                  HCT04190
0349 00 4C200359          BSC  L  RSCCD,Z     BYPASS PRINTOUT IF B ANCH  HCT04200
034B 0  C024              LD      RSSAD       LOAD ILSW FOR ERROR INTRUP HCT04210
034C 0  E028              AND     RSSAI       ISOLATE PARITY ERROR       HCT04220
034D 00 4C180352          BSC  L  RSCCC,+-                               HCT04230
034F 00 44000397          BSI  L  LOG                                    HCT04240
0351 0  047F              DC      MES04       ERROR INT-PARITY           HCT04250
0352 0  C01D        RSCCC LD      RSSAD       TEST FOR INVALID OP  ODE   HCT04260
0353 0  E022              AND     RSSAJ       ISOLATE INV OP ERROR       HCT04270
0354 00 4C180359          BSC  L  RSCCD,+-                               HCT04280
0356 00 44000397          BSI  L  LOG                                    HCT04290
0358 0  0489              DC      MES05       ERROR INT-INV OP COD       HCT04300
0359 00 0C000168    RSCCD XIO  L  RSQAF       IF BIT SW 12 ON THEN STOR  HCT04310
035B 00 C400016E          LD   L  RSQAL                                  HCT04320
035D 0  E019              AND     RSSAK       ACCUM, INS CTR, STATUS     HCT04330
035E 00 4C88031D          BSC  I  RSCCA,+     AND WAIT                   HCT04340
0360 0  C00F              LD      RSSAD       LOAD ILSW FOR ERROR        HCT04350
0361 0  180C              SRA     12          PLACE BITS 0-4 OF IL W IN  HCT04360
0362 0  E817              OR      RSSAN       11-15 AND OR IN WAIT OP    HCT04370
0363 0  0004              STO     RSCCH       STORE IN WAIT              HCT04380
0364 0  C0B8              LD      RSCCA       LOAD INS CTR IN ACCUM      HCT04390
0365 0  1890              SRT     16          TRANSFER INS CTR TO        HCT04400
0366 0  C004              LD      RSSAA       RESTORE ACCUM CONTENTS     HCT04410
0367 0  2000        RSCCE LDS     0           RESTORE OFLO+CARRY I DICA  HCT04420
0368 0  3000        RSCCH WAIT                                           HCT04430
0369 00 4C80031D          BSC  I  RSCCA       RETURN TO MAINLINE         HCT04440
                    *                                                    HCT04450
                    *  STORAGE AREAS FOR ERROR ROUTINES                  HCT04460
                    *                                                    HCT04470
036B 0  0000        RSSAA DC      0           SAVED ACCUMULATOR BU FER   HCT04480
036C    0002              BSS  E  2                                      HCT04490
036E 0  0000        RSSAC DC      /0000       SENSE ILSW FOR             HCT04500
036F 0  0300              DC      /0300       LEVEL ZERO                 HCT04510
0370 0  0000        RSSAD DC      0           STORAGE FOR ILSW           HCT04520
0371 0  FFFF        RSSAF DC      -1          IN SP ROUTINE -1NO, 2YES   HCT04530
0372 0  FFFF        RSSAG DC      -1          NOT IN SP ROUTINE          HCT04540
0373 0  0002        RSSAH DC      2           IN STORAGE PROTECT ROUTIN  HCT04550
0374 0  2000        RSSAE DC      /2000                                  HCT04560
0375 0  4000        RSSAI DC      /4000                                  HCT04570
0376 0  8000        RSSAJ DC      /8000                                  HCT04580
0377 0  0008        RSSAK DC      /0008       ISOLATE BIT SW 12          HCT04590
0378 0  000E        RSSAL DC      14                                     HCT04600
0379 0  0001        RSSAM DC      1                                      HCT04610
037A 0  3000        RSSAN DC      /3000       WAIT INSTRUCTION           HCT04620
037B 0  0028        RSSAO DC      /0028                                  HCT04630
037C 0  0020        RSSAP DC      /0020                                  HCT04640
037D 0  5555        RSSAQ DC      /5555                                  HCT04650
                    *                                                    HCT04660
                    *  ERROR ROUTINE TO SERVICE NON-INTERRUPT ERRORS     HCT04670
                    *                                                    HCT04680
037E 0  0000        RSDDD DC      0           STORAGE FOR RETURN ADDRES  HCT04690
037F 0  2810              STS     RSDDJ       STORE STATUS OFLO+CA RY    HCT04700
0380 0  C0FD        RSDDX LD      RSDDD                                  HCT04710
0381 0  90F6              S       RSSAL       CORRECT I REG              HCT04720
0382 0  1890              SRT     16          STORE I REG IN Q           HCT04730
0383 0  C0FA              LD      RSDDD                                  HCT04740
0384 0  80F4              A       RSSAM       INCREMENT RETURN ADDRESS   HCT04750
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0385 0  00F8              STO     RSDDD       BY 1 TO AVOID DC IN  AINL  HCT04760
0386 00 0C000168          XIO  L  RSQAF       IF SW 12 ON-CORRECT CONSL  HCT04770
0388 00 C400016E          LD   L  RSQAL                                  HCT04780
038A 00 E4000377          AND  L  RSSAK       INDICATOR LAMPS AND WAIT   HCT04790
038C 00 4CA0037E          BSC  I  RSDDD,Z                                HCT04800
038E 00 C400021F          LD   L  RSQAN       RELOAD A REG AS PER ERROR  HCT04810
0390 0  2000        RSDDJ LDS     0           SAVE CARY+OFLO STATU       HCT04820
0391 0  3000              WAIT                                           HCT04830
0392 00 4C80037E          BSC  I  RSDDD                                  HCT04840
0394 0  C0E8        RSDDK LD      RSSAQ                                  HCT04850
0395 00 4C40012F          BOSC L  RSDKS       RESET INTER-RETURN START   HCT04860
                    ********************************************         HCT04870
                    *                LOG ROUTINE               *       HCT04880
                    ********************************************         HCT04890
                    *                                                    HCT04900
0397 0  0000        LOG   DC      0                                SE    HCT04910
0398 0  681B        LOG01 STX     3 LOG06+1   SAVE IX 3                  HCT04920
0399 00 0C000168          XIO  L  RSQAF                                  HCT04930
039B 00 C400016E          LD   L  RSQAL                                  HCT04940
039D 00 4C1003B9          BSC  L  TWRTR,-     BRANCH IF 1053 OUTPU       HCT04950
                    *                                                    HCT04960
039F 00 C4800397          LD   I  LOG         GET MESSAGE ADDRESS        HCT04970
03A1 0  0052              STO     PRWRT       SET IN IOCC                HCT04980
                    *                                                    HCT04990
03A2 0  084D        LOG02 XIO     PRSNS       CHECK PRINTER READY        HCT05000
03A3 00 4C0403A9          BSC  L  LOG03,E     BRANCH IF NOT READY        HCT05010
03A5 0  1801              SRA     1                                      HCT05020
03A6 00 4CC403AB          BSC  L  LOG04,E     BRANCH IF BUSY             HCT05030
03A8 0  7004              MDX     LOG05       READY AND NOT BUSY         HCT05040
                    *                                                    HCT05050
03A9 0  300A        LOG03 WAIT    10          NOT READY                  HCT05060
03AA 0  70F7              MDX     LOG02       CHECK AGAIN                HCT05070
                    *                                                    HCT05080
03AB 0  300B        LOG04 WAIT    11          BUSY                       HCT05090
03AC 0  70F5              MDX     LOG02       CHECK AGAIN                HCT05100
                    *                                                    HCT05110
03AD 0  0846        LOG05 XIO     PRWRT       OUTPUT MESSAGE             HCT05120
                    *                                                    HCT05130
03AE 0  0943              XIO     PRSN        CHECK FOR OP COMPLT        HCT05140
03AF 0  1002              SLA     2                                      HCT05150
03B0 0  4810              BSC     -                                      HCT05160
03B1 0  70FC              MDX     *-4                                    HCT05170
03B2 0  083D              XIO     PRSNS       RESET DSW                  HCT05180
                    *                                                    HCT05190
                    *                PRINTING COMPLETE                   HCT05200
                    *                                                    HCT05210
03B3 00 67000000    LOC06 LDX  L3 0           RESTORE IX 3               HCT05220
03B5 00 74010397          MDX  L  LOG,1       BUMP RETURN                HCT05230
                    *                                                    HCT05240
03B7 00 4C800397          BSC  I  LOG         RETURN TO USER         SX  HCT05250
                    *                                                    HCT05260
03B9 0  1010        TWRTR SLA     16                                     HCT05270
03BA 0  0032              STO     WRDSW                                  HCT05280
03BB 0  083A              XIO     TWSNS       CHECK IF TYPEWRITER        HCT05290
03BC 0  1005              SLA     5           READY                      HCT05300
03BD 0  130F              SRA     15                                     HCT05310
03BE 00 4C1803C2          BSC  L  TWR01,+-                               HCT05320
                    *                                                    HCT05330
03C0 0  300C              WAIT    12          NOT READY                  HCT05340
03C1 0  70F9              MDX     TWRTR+2                                HCT05350
                    *                                                    HCT05360
03C2 0  C028        TWR01 LD      TWRTO       CARRAIGE RETURN AND        HCT05370
03C3 0  002A              STO     IOARA       LINE SPACE TO IO ARA       HCT05380
                    *                                                    HCT05390
03C4 0  0833              XIO     TWWRT       CARG RETURN/LINE SP        HCT05400
                    *                                                    HCT05410
03C5 0  0830              XIO     TWSNS       HANG TILL NOT BUSY         HCT05420
03C6 0  180B              SRA     11                                     HCT05430
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CORE STORAGE FUNCTION TEST
HIGH CORE TEST

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03C7 0  4804            BSC     E                                       HCT05440
03C8 0  70FC            MDX     *-4                                     HCT05450
                        *                                               HCT05460
03C9 0  6301            LDX   3 1               BYPASS 1443 WORD COU T  HCT05470
03CA 00 C4800397        LD    I LOG             GET MESSAGE ADDRESS     HCT05480
03CC 0  0001            STO     TWRG2+1                                 HCT05490
                        *                                               HCT05500
03CD 00 C70C0000  TWRO2 LD    L3 0              GET WORD TO PRINT       HCT05510
03CF 00 D400042A        STO   L CODWD           SET IN CONVERSION RT    HCT05520
03D1 0  F01A            EOR     TWRT1           CHECK IF TERMINATOR     HCT05530
03D2 00 4C1803B3        BSC   L LOG06,+-        BRANCH IF TERMINATOR    HCT05540
                        *                                               HCT05550
                        ***********************************************HCT05560
03D4 00 440003FA        BSI   L CODCV           GO CONVERT 43 TO TW  SRC HCT05570
                        ***********************************************HCT05580
                        *                                               HCT05590
03D6 00 C400042A        LD    L CODWD                                   HCT05600
03D8 0  0015            STO     IOARA                                   HCT05610
                        *                                               HCT05620
                        *                       OUTPUT A CHARACTER      HCT05630
                        *                                               HCT05640
03D9 0  081E      XIOWR XIO     TWWRT           WRITE CHARACTER         HCT05650
                        *                                               HCT05660
03DA 0  081B      XIOSN XIO     TWSNS           HANG ON BUSY            HCT05670
03DB 0  1808            SRA     11                                      HCT05680
03DC 0  4804            BSC     E                                       HCT05690
03DD 0  70FC            MDX     XIOSN           BUSY                    HCT05700
                        *                                               HCT05710
                        *               CHECK IF 1ST 1/2 WORD           HCT05720
                        *                                               HCT05730
03DE 0  C00E              LD      WRDSW         GET 1/2 WORD SWITCH     HCT05740
03DF 0  4804              BSC     E                                     HCT05750
03E0 0  7006              MDX     TWR03         GO SET UP NEXT WORD     HCT05760
                        *                                               HCT05770
                        *               SET UP FOR 2ND 1/2 WORD         HCT05780
                        *                                               HCT05790
03E1 0  C00C              LD      IOARA                                 HCT05800
03E2 0  1008              SLA     8             POSITION 2ND 1/2 WD     HCT05810
03E3 0  900A              STO     IOARA                                 HCT05820
03E4 00 740103ED          MDX   L WRDSW,1       BUMP WORD SWITCH        HCT05830
03E6 0  70F2              MDX     XIOWR         GO WRITE 2ND 1/2 WD     HCT05840
                        *                                               HCT05850
                        *               SET UP FOR NEXT WORD            HCT05860
                        *                                               HCT05870
03E7 0  7301      TWR03 MDX   3 1               NEXT WORD INDEX         HCT05880
03E8 00 740103ED        MDX   L WRDSW,1         BUMP WORD SWITCH        HCT05890
03EA 0  70E2            MDX     TWR02         GO GET NEXT WORD        HCT05900
                        *                                               HCT05910
                        *               LOG   CONSTANTS                 HCT05920
                        *                                               HCT05930
03EB 0  8103      TWRTO DC      /8103           LINE SP/CARRAIGE RTN    HCT05940
03EC 0  FFFF      TWRT1 DC      /FFFF           TERMINATOR              HCT05950
03ED 0  0000      WRDSW DC      0               1/2 WORD SWITCH         HCT05960
03EE 0  0000      IOARA DC      0               OUTPUT AREA             HCT05970
                        *                                               HCT05980
03F0    0000            BSS   E 0                                       HCT05990
                        *                                               HCT06000
03F0 0  0000      PRSNS DC      /0000           PRINTER  SENSE IOCC     HCT06010
03F1 0  3701            DC      /3701                                   HCT06020
03F2 0  0000      PRSN  DC      0               NON RESET SENSE         HCT06030
03F3 0  3700            DC      /3700                                   HCT06040
03F4 0  0000      PRWRT DC      /0000           PRINTER  WRITE IOCC     HCT06050
03F5 0  3500            DC      /3500                                   HCT06060
03F6 0  0000      TWSNS DC      /0000           TYPEWTR  SENSE IOCC     HCT06070
03F7 0  0F01            DC      /0F01           DSW RESET          PM01 HCT06080
03F8 0  03EE      TWWRT DC      IOARA           TYPEWTR  WRITE IOCC     HCT06090
03F9 0  0900            DC      /0900           WR TYPEWRITER      PM02 HCT06100
                        *                                               HCT06110
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CORE STORAGE FUNCTION TEST
HIGH CORE TEST

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                        ***********************************************HCT06120
                        *                1443 CODE TO 1816/1053   *   HCT06130
                        *                CODE CONVERSION ROUTINE  *   HCT06140
                        ***********************************************HCT06150
                        *                                               HCT06160
03FA 0  0000      CODCV DC      0                                   SE  HCT06170
03FB 0  6927            STX   1 CODC4+1         SAVE INDEX REGS         HCT06180
03FC 0  6A28            STX   2 CODC4+3                                 HCT06190
03FD 0  6829            STX   3 CODC4+5                                 HCT06200
                        *                                               HCT06210
03FE 0  1010            SLA     16              CLEAR LEFT HALF WORD    HCT06220
03FF 0  D028            STO     LHIND           *INDICATOR              HCT06230
0400 0  6300            LDX   3 0                                       HCT06240
                        *                                               HCT06250
0401 0  C028      CODC1 LD      CODWD           GET WORD TO CONVERT     HCT06260
0402 0  1890            SRT     16              SET IN Q                HCT06270
0403 0  C027            LD      LHIND                                   HCT06280
0404 0  4820            BSC     Z               SKIP IF LEFT HALF       HCT06290
0405 0  1088            SLT     8               POSITION RIGHT HALF     HCT06300
                        *                                               HCT06310
0406 0  1010            SLA     16                                      HCT06320
0407 0  1084            SLT     4               ZONE TO ACCUM           HCT06330
0408 0  D023            STO     CODOO                                   HCT06340
0409 00 6580042C        LDX   I1 CODOO          IX 1 = ZONE             HCT06350
                        *                                               HCT06360
040B 0  1010            SLA     16                                      HCT06370
040C 0  1084            SLT     4               DIGIT TO ACCUM          HCT06380
040D 0  D01E            STO     CODOO                                   HCT06390
040E 00 6680042C        LDX   I2 CODOO          IX 2 = DIGIT            HCT06400
                        *                                               HCT06410
0410 00 C500042F        LD    L1 ZONE           GET ZONE TABLE ADDRS    HCT06420
0412 0  D001            STO     CODC2+1         SET IN CONVERSION WD    HCT06430
                        *                                               HCT06440
0413 00 C6000000  CODC2 LD    L2 0              GET CONVERTED CODE      HCT06450
0415 00 D700042D        STO   L3 CODO1                                  HCT06460
                        *                                               HCT06470
0417 0  C013            LD      LHIND                                   HCT06480
0418 00 4C20041E        BSC   L CODC3,Z         BRNCH IF RIGHT HALF     HCT06490
041A 00 7401042B        MDX   L LHIND,1                                 HCT06500
041C 0  7301            MDX   3 1                                       HCT06510
041D 0  70E3            MDX     CODC1           GO CONVERT RIGHT HLF    HCT06520
                        *                                               HCT06530
041E 0  C00E      CODC3 LD      CODO1           PACK CONVERTED CODES    HCT06540
041F 0  1008            SLA     8                                       HCT06550
0420 0  E80D            OR      CODO2                                   HCT06560
0421 0  D008            STO     CODWD                                   HCT06570
                        *                                               HCT06580
0422 00 65000000  CODC4 LDX   L1 0              RESTORE INDEX REGS      HCT06590
0424 00 66000000        LDX   L2 0                                      HCT06600
0426 00 67000000        LDX   L3 0                                      HCT06610
                        *                                               HCT06620
0428 00 4C8003FA        BSC   I CODCV           RETURN TO USER      SX  HCT06630
                        *                                               HCT06640
                        *                                               HCT06650
                        *               CONSTANTS                       HCT06660
                        *                                               HCT06670
042A 0  0000      CODWD DC      0               WORD LOCATION           HCT06680
042B 0  0000      LHIND DC      0               LEFT HALF INDICATOR     HCT06690
042C 0  0000      CODOO DC      0               WORK AREA               HCT06700
042D 0  0000      CODO1 DC      0               CONVERTED LH CHARACT    HCT06710
042E 0  0000      CODO2 DC      0               CONVERTED RH CHARACT    HCT06720
                        *                                               HCT06730
                        *                                               HCT06740
                        *           1443 TO 1816/1053  CODE             HCT06750
                        *           CONVERSION TABLES                   HCT06760
                        *                                               HCT06770
042F 0  0433      ZONE  DC      ZONEN           NO ZONE                 HCT06780
0430 0  043E            DC      ZONE1           0 ZONE                  HCT06790
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CORE STORAGE FUNCTION TEST
HIGH CORE TEST

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0431 0 0449          DC    ZONE2    11 ZONE          HCT06800
0432 0 0453          DC    ZONE3    12 ZONE          HCT06810
                     *                               HCT06820
0433 0 0021    ZONEN DC    /0021    SPACE            HCT06830
0434 0 00FC          DC    /00FC    1                HCT06840
0435 0 00D8          DC    /00D8    2                HCT06850
0436 0 00DC          DC    /00DC    3                HCT06860
0437 0 00F0          DC    /00F0    4                HCT06870
0438 0 00F4          DC    /00F4    5                HCT06880
0439 0 00D0          DC    /00D0    6                HCT06890
043A 0 00D4          DC    /00D4    7                HCT06900
043B 0 00E4          DC    /00E4    8                HCT06910
043C 0 00E0          DC    /00E0    9                HCT06920
043D 0 00C4          DC    /00C4    0                HCT06930
043E 0 0000    ZONE1 DC    0                         HCT06940
043F 0 0000          DC    0                         HCT06950
0440 0 009A          DC    /009A    S                HCT06960
0441 0 009E          DC    /009E    T                HCT06970
0442 0 00B2          DC    /00B2    U                HCT06980
0443 0 00B6          DC    /00B6    V                HCT06990
0444 0 0092          DC    /0092    W                HCT07000
0445 0 0096          DC    /0096    X                HCT07010
0446 0 00A6          DC    /00A6    Y                HCT07020
0447 0 00A2          DC    /00A2    Z                HCT07030
0448 0 0021          DC    /0021    SPACE            HCT07040
0449 0 0000    ZONE2 DC    0                         HCT07050
044A 0 007E          DC    /007E    J                HCT07060
044B 0 005A          DC    /005A    K                HCT07070
044C 0 005E          DC    /005E    L                HCT07080
044D 0 0072          DC    /0072    M                HCT07090
044E 0 0076          DC    /0076    N                HCT07100
044F 0 0052          DC    /0052    O                HCT07110
0450 0 0056          DC    /0056    P                HCT07120
0451 0 0066          DC    /0066    Q                HCT07130
0452 0 0062          DC    /0062    R                HCT07140
0453 0 0000    ZONE3 DC    0                         HCT07150
0454 0 003E          DC    /003E    A                HCT07160
0455 0 001A          DC    /001A    B                HCT07170
0456 0 001E          DC    /001E    C                HCT07180
0457 0 0032          DC    /0032    D                HCT07190
0458 0 0036          DC    /0036    E                HCT07200
0459 0 0012          DC    /0012    F                HCT07210
045A 0 0016          DC    /0016    G                HCT07220
045B 0 0026          DC    /0026    H                HCT07230
045C 0 0022          DC    /0022    I                HCT07240
045D 0 0086          DC    /0086    0 ERROR          HCT07250
045E 0 0000          DC    /0000    PERIOD           HCT07260
                     *                               HCT07270
045F 0 000A    MES01 DC    10       WORD CT          HCT07280
0460 0 2435          DC    /2435    ME               HCT07290
0461 0 2426          DC    /2426    MO               HCT07300
0462 0 2918          DC    /2918    RY               HCT07310
0463 0 0013          DC    /0013     T               HCT07320
0464 0 3512          DC    /3512    ES               HCT07330
0465 0 1300          DC    /1300    T                HCT07340
0466 0 3839          DC    /3839    HI               HCT07350
0467 0 0033          DC    /0033     C               HCT07360
0468 0 2629          DC    /2629    OR               HCT07370
0469 0 3500          DC    /3500    E                HCT07380
046A 0 FFFF          DC    /FFFF    TERM             HCT07390
                     *                               HCT07400
046B 0 0006    MES02 DC    6        WD CT            HCT07410
046C 0 2729          DC    /2729    PR               HCT07420
046D 0 2637          DC    /2637    OG               HCT07430
046E 0 2931          DC    /2931    RA               HCT07440
046F 0 2400          DC    /2400    M                HCT07450
0470 0 3525          DC    /3525    EN               HCT07460
0471 0 3400          DC    /3400    D                HCT07470
```


CORE STORAGE FUNCTION TEST
HIGH CORE TEST

```
0472 0 FFFF          DC    /FFFF    TERM             HCT07480
                     *                               HCT07490
0473 0 000B    MES03 DC    11       WD CT            HCT07500
0474 0 3529          DC    /3529    ER               HCT07510
0475 0 2926          DC    /2926    RO               HCT07520
0476 0 2900          DC    /2900    R                HCT07530
0477 0 3925          DC    /3925    IN               HCT07540
0478 0 1300          DC    /1300    T                HCT07550
0479 0 1213          DC    /1213    ST               HCT07560
047A 0 2629          DC    /2629    OR               HCT07570
047B 0 3700          DC    /3700    G                HCT07580
047C 0 2729          DC    /2729    PR               HCT07590
047D 0 2613          DC    /2613    OT               HCT07600
047E 0 FFFF          DC    /FFFF    TERM             HCT07610
                     *                               HCT07620
047F 0 0008    MES04 DC    8        WD CT            HCT07630
0480 0 3529          DC    /3529    ER               HCT07640
0481 0 2926          DC    /2926    RO               HCT07650
0482 0 2900          DC    /2900    R                HCT07660
0483 0 3925          DC    /3925    IN               HCT07670
0484 0 1300          DC    /1300    T                HCT07680
0485 0 2731          DC    /2731    PA               HCT07690
0486 0 2939          DC    /2939    RI               HCT07700
0487 0 1318          DC    /1318    TY               HCT07710
0488 0 FFFF          DC    /FFFF    TERM             HCT07720
                     *                               HCT07730
0489 0 000B    MES05 DC    11       WD CT            HCT07740
048A 0 3529          DC    /3529    ER               HCT07750
048B 0 2926          DC    /2926    RO               HCT07760
048C 0 2900          DC    /2900    R                HCT07770
048D 0 3925          DC    /3925    IN               HCT07780
048E 0 1300          DC    /1300    T                HCT07790
048F 0 3925          DC    /3925    IN               HCT07800
0490 0 1500          DC    /1500    V                HCT07810
0491 0 2627          DC    /2627    OP               HCT07820
0492 0 0033          DC    /0033     C               HCT07830
0493 0 2634          DC    /2634    OD               HCT07840
0494 0 3500          DC    /3500    E                HCT07850
0495 0 FFFF          DC    /FFFF    TERM             HCT07860
                     *                               HCT07870
0496 0 0002    MES06 DC    2        WD CT            HCT07880
0497 0 3529          DC    /3529    ER               HCT07890
0498 0 0001          DC    /0001     1               HCT07900
0499 0 FFFF          DC    /FFFF    TERM             HCT07910
                     *                               HCT07920
049A 0 0002    MES07 DC    2        WD CT            HCT07930
049B 0 3529          DC    /3529    ER               HCT07940
049C 0 0002          DC    /0002     2               HCT07950
049D 0 FFFF          DC    /FFFF    TERM             HCT07960
                     *                               HCT07970
049E 0 0002    MES08 DC    2        WD CT            HCT07980
049F 0 3529          DC    /3529    ER               HCT07990
04A0 0 0003          DC    /0003     3               HCT08000
04A1 0 FFFF          DC    /FFFF    TERM             HCT08010
                     *                               HCT08020
04A2 0 0002    MES09 DC    2        WD CT            HCT08030
04A3 0 3529          DC    /3529    ER               HCT08040
04A4 0 0004          DC    /0004     4               HCT08050
04A5 0 FFFF          DC    /FFFF    TERM             HCT08060
                     *                               HCT08070
04A6 0 0002    MES10 DC    2        WD CT            HCT08080
04A7 0 3529          DC    /3529    ER               HCT08090
04A8 0 0005          DC    /0005     5               HCT08100
04A9 0 FFFF          DC    /FFFF    TERM             HCT08110
                     *                               HCT08120
04AA 0 0002    MES11 DC    2        WD CT            HCT08130
04AB 0 3529          DC    /3529    ER               HCT08140
04AC 0 0006          DC    /0006     6               HCT08150
```

CORE STORAGE FUNCTION TEST
HIGH CORE TEST

```
04AD 0  FFFF            DC      /FFFF     TERM          HCT08160
04AE 0  0000     RSEND  DC      0                       HCT08170
04AF 0  0000            DC      0                       HCT08180
04B0 0  0000            DC      0                       HCT08190
04B2    012C            END     RSDKR                   HCT08200
```


CORE STORAGE FUNCTION TEST
HIGH CORE TEST

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
CODCV	03FA	03D4,0428
CODC1	0401	041D
CODC2	0413	0412
CODC3	041E	0418
CODC4	0422	03FB,03FC,03FD
CODWD	042A	03CF,03D6,0401,0421
CODO0	042C	0408,0409,040D,040E
CODO1	042D	0415,041E
CODO2	042E	0420
IOARA	03EE	03C3,03D8,03E1,03E3,03F8
LHIND	0428	03FF,0403,0417,041A
LOG	0397	033B,034F,0356,039F,0385,0387,03CA
LOG01	0398	
LOG02	03A2	03AA,03AC
LOG03	03A9	03A3
LOG04	03AB	03A6
LOG05	03AD	03A8
LOG06	03B3	0398,03D2
MES01	045F	
MES02	046B	
MES03	0473	033D
MES04	047F	0351
MES05	0489	0358
MES06	0496	
MES07	049A	
MES08	049E	
MES09	04A2	
MES10	04A6	
MES11	04AA	
NEXT	0324	0322
PRSN	03F2	03AE
PRSNS	03F0	03A2,03B2
PRWRT	03F4	03A1,03AD
RSAAB	0141	013D
RSAAC	0146	0141,0159
RSAAD	0147	013F
RSAAE	0148	0132,0136,014E
RSAAF	014E	0145
RSAAG	0153	0152
RSAAH	0149	0135,0151,0153,015A,015C,015E,0188,01A0,0206,0248, 0277,02C7,02F7
RSAAI	015C	0157
RSAAJ	0152	015F
RSAAK	014A	0142,0174,0290
RSAAL	0160	0171
RSAAM	0164	012F
RSAAN	0166	012C
RSABA	0171	0158
RSABB	0185	0183
RSABC	0187	018F
RSABD	0190	018C
RSABE	0192	01A0,01AA,0181
RSABF	01A5	0196
RSABG	0182	01AE
RSABH	0184	018A,031B
RSABI	0182	0175,030E
RSABJ	01D6	01C7
RSABK	01F7	01E8
RSABL	01E0	01F2,01FD
RSABM	0205	0201
RSABN	018F	01D4,01DC,020C
RSABO	020D	0208
RSABP	018D	020E
RSABQ	01E1	0204
RSABR	018C	0215

CORE STORAGE FUNCTION TEST
HIGH CORE TEST

RSACA	0245	0240
RSACB	023B	024E
RSACD	0247	0244
RSACE	025A	0256
RSACF	026A	0259,025B
RSACG	0254	026E
RSACH	0252	0265,0274
RSACJ	0220	0217,0282
RSACK	0226	0279
RSACL	0251	027C
RSACM	028B	02AC
RSACN	029F	0286,02C0,02C9
RSACO	02A3	029A,02C6
RSACP	02EB	02DC
RSACQ	02D3	02E6,02F0,02F9
RSACR	02D4	02D2,02F6
RSACS	0297	02FC
RSACU	0296	0292,0303
RSACV	0290	0284
RSACW	027D	0229
RSACX	022A	0228
RSADA	0305	0294
RSADB	024F	024A
RSCCA	031D	0168,0341,035E,0364,0369
RSCCB	0343	032E,033E
RSCCC	0352	034D
RSCCD	0359	0339,0349,0354
RSCCE	0367	031F
RSCCG	033F	0331
RSCCH	0368	0363
RSCCQ	031B	0307
RSDDD	037E	01A2,01C9,01F4,0267,02B8,02E8,0380,0383,0385,038C, 0392
RSDDJ	0390	037F
RSDDK	0394	032A
RSDDX	0380	
RSDKR	012C	0481
RSDKS	012F	0164,0166,0319,0395
RSEND	04AE	016A,02A3,02D4
RSEXI	0310	
RSFAA	014B	0182
RSFAB	014C	0183,0305
RSFAC	014D	0134
RSQAC	016A	0185,0190,01BD,0238,024F,0297,02CF
RSQAD	016B	0179
RSQAE	016C	0187,0188,0189,0192,0193,0195,01AC
RSQAF	0168	019A,01A5,01B4,01CE,01D6,01EC,01F7,020F,025F,026F, 027D,0280,028B,02E0,02EB,02FD,0308,0310,0324,0333, 0343,0359,0386,0399
RSQAH	021A	018F,01C0,01C3,01C5,01E1,01E5,0205,020A,022A,022B, 022E,022F,0231,0232,0235,0236
RSQAI	021B	01C2
RSQAJ	021C	01DE
RSQAK	021D	01DF,01E0,01E3,01E7,01FF,0203
RSQAL	016E	0168,019C,01A6,01B6,01D0,01D8,01EE,01F9,0211,0261, 0271,027F,0282,028D,02E2,02ED,02FF,030A,0312,0326, 0335,0345,035B,0388,039B
RSQAM	021E	0208,02C3,02F3
RSQAN	021F	0198,01CC,01EA,025D,02AE,02DE,038E
RSQAO	0169	0178
RSQAP	016D	0177
RSQAQ	0218	0224
RSQAR	0219	0225,0226
RSQAS	0318	0314
RSQAU	016F	017C
RSQAV	0170	017F
RSQAW	0316	
RSRAA	0285	023A,023B,0242,0245,0247,024C,0251,0254,026A,0276

CORE STORAGE FUNCTION TEST
HIGH CORE TEST

RSRAB	0286	023D,023F
RSRAC	0287	022C,0233,0258,025A,029F,02AB
RSRAE	0288	0299,02A0,02A4,02A7,02A9,02C2,02C5,02D1,02D5,02D8, 02DA,02F2,02F5
RSRAF	0289	02A6,02D7
RSRAG	028A	01B8,0213,0281,0301
RSRAH	028B	030C
RSRAI	028C	019E,01A8,01D2,01DA,01F0,01FB,0263,0273,0284,028F, 02E4,02EF
RSRAJ	028E	0252
RSRAK	028F	0253,026C
RSRAX	028D	0337,0347
RSSAA	036B	031E,0366
RSSAC	036E	0320
RSSAD	0370	0321,032C,033F,034B,0352,0360
RSSAE	0374	032D,0340
RSSAF	0371	029D,02CD,0330
RSSAG	0372	02CB
RSSAH	0373	029B
RSSAI	0375	034C
RSSAJ	0376	0353
RSSAK	0377	035D,038A
RSSAL	0378	0381
RSSAM	0379	0384
RSSAN	037A	0362
RSSAO	037B	0328
RSSAP	037C	0329
RSSAQ	037D	0394
TWRTR	03B9	039D,03C1
TWRTO	03EB	03C2
TWRT1	03EC	03D1
TWRO1	03C2	03BE
TWRO2	03CD	03CC,03EA
TWRO3	03E7	03E0
TWSNS	03F6	017D,03B8,03C5,03DA
TWWRT	03F8	0180,03C4,03D9
WRDSW	03ED	038A,03DE,03E4,03E8
XIOSN	03DA	03DD
XIOWR	03D9	03E6
ZONE	042F	0410
ZONEN	0433	042F
ZONE1	043E	0430
ZONE2	0449	0431
ZONE3	0453	0432

```
                         *
                         *  MEMORY TEST-0-9 CORES
                         *
                         *
                              ABS
028C                          ORG     300
012C 0  C845             RSSTB LDD     RSAAN
012D 00 DC000000              STD   L   0
012F 00 C4000232         RSSTA LD    L   RSNPP
0131 00 D4000231              STO   L   RSPPC
0133 00 C400018C              LD    L   RSLAJ
0135 00 D4000184              STO   L   RSLAA
                         *
                         *  DETERMINE MACHINE TYPE
                         *
0137 00 C4000197              LD    L   RSLAE
0139 00 D4000003              STO   L   3
013B 0  6300                  LDX   X3  0
013C 00 C4000003              LD    L   3
013E 00 4C18014E              BSC   L   RSDMS,+-
                         *
                         *  1800 MODIFICATIONS
                         *
0140 0  C02A                  LD        RSR18
0141 00 D40C0227              STO   L   RSRBS+1
0143 0  C029                  LD        RSD18
0144 00 D40002B5              STO   L   TWSNS+1
0146 0  C025                  LD        RST18
0147 00 D40002B7              STO   L   TWWRT+1
0149 0  C025                  LD        WAITO
014A 00 D4000174              STO   L   WAITA
014C 00 D40001EC              STO   L   WAITB
                         *
                         *  MEMORY SIZE ROUTINE
                         *
014E 0  C01F             RSDMS LD      RSZRO
014F 00 D4000000              STO   L   0
0151 00 C40001B4              LD    L   RSLAA
0153 0  D001             RSKBC STO     RSKBA+1
0154 00 D40001B4         RSKBA STO   L   RSLAA
0156 00 C4000000              LD    L   0
0158 00 4C180165              BSC   L   RSKBD,+-
015A 00 940001B3              S     L   RSLAB
015C 00 D40001B4              STO   L   RSLAA
015E 00 D40001B5              STO   L   RSLAC
0160 00 840001B2              A     L   RSLAQ
0162 00 D40001B9              STO   L   RSLAG
0164 0  700F                  MDX       WAITA
0165 00 C40001B4         RSKBD LD    L   RSLAA
0167 0  1001                  SLA       1
0168 00 D40001B4              STO   L   RSLAA
016A 0  70E8                  MDX       RSKBC
                         *
                         *  STORAGE FOR INITIALIZATIONS
                         *
016B 0  0240             RSR18 DC        /0240       1800 READ SWITCH
016C 0  0902             RST18 DC        /0902       1800 TYPE
016D 0  0F03             RSD18 DC        /0F03       1800 TYPE DSW-RESET
016E 0  0000             RSZRO DC        /0000       CONST ZERO
016F 0  3000             WAITO DC        /3000       WAIT INSTRUCTION
0170    0002                  BSS   E   2
0172 00 4C00012F         RSAAN BSC   L   RSSTA
                         *
                         *  WAIT TO TURN DISABLE INTERRUPT
                         *  SWITCH TO ON POSITION-1800 ONLY
                         *
0174 0  1000             WAITA SLA       0           DISABLE INTERRUPTS
                         *
```



```
                         *  MAIN ROUTINE
                         *
                         *
                         *  LOAD ZEROS IN CORES
                         *
0175 0  C040             RSR01 LD      RSLAD       ACC=/0000
0176 00 04800185              STO   I   RSLAC
0178 00 C4800185              LD    I   RSLAC
017A 00 4C18017F              BSC   L   RSQ01,+-
017C 00 44000202              BSI   L   RSEOR
017E 0  70F6                  MDX       RSR01
017F 00 44000238         RSQ01 BSI   L   RSLOP
                         *
                         *  LOAD ONES IN CORES
                         *
0181 0  C035             RSR02 LD      RSLAE       ACC=/FFFF
0182 00 04800185              STO   I   RSLAC
0184 00 C4800185              LD    I   RSLAC
0186 0  F030                  EOR       RSLAE
0187 00 4C18018C              BSC   L   RSQ02,+-
0189 00 44000202              BSI   L   RSEOR
018B 0  70F5                  MDX       RSR02
018C 00 44000238         RSQ02 BSI   L   RSLOP
                         *
                         *  ADDRESSING ROUTINE
                         *
018E 0  C026             RSR03 LD      RSLAC       ACC=ADDRESS
018F 00 04800185              STO   I   RSLAC
0191 00 C4800185              LD    I   RSLAC
0193 0  F021                  EOR       RSLAC
0194 00 4C180199              BSC   L   RSQ03,+-
0196 00 44000202              BSI   L   RSEOR
0198 0  70F5                  MDX       RSR03
0199 00 44000238         RSQ03 BSI   L   RSLOP
                         *
                         *  BIT ISOLATION ROUTINE
                         *
019B 0  C01F             RSVBB LD      RSLAI
019C 0  D01B                  STO       RSLAF
019D 0  C01A             RSR04 LD      RSLAF       ACC=BIT PATTERN
019E 00 D4800185              STO   I   RSLAC
01A0 00 C4800185              LD    I   RSLAC
01A2 0  F015                  EOR       RSLAF
01A3 00 4C1801A8              BSC   L   RSQ04,+-
01A5 00 44000202              BSI   L   RSEOR
01A7 0  70F5                  MDX       RSR04
01A8 0  C00F             RSQ04 LD      RSLAF
01A9 0  1801                  SRA       1
01AA 0  D00D                  STO       RSLAF
01AB 00 4C1801AF              BSC   L   RSBIL,+-
01AD 0  70EF                  MDX       RSR04
01AE 0  70EC                  MDX       RSVBB
01AF 00 44000238         RSBIL BSI   L   RSLOP
01B1 0  700B                  MDX       RSSPT
                         *
                         *  STORAGE AREAS-1
                         *
01B2 0  000D             RSLAQ DC        13          NUMBER OF CORES TO TEST
01B3 0  0003             RSLAB DC        3           NUMBER OF CORES BELO  0
01B4 0  0800             RSLAA DC        /0800       LOWEST ADDRESS TO TEST=-3
01B5 0  0000             RSLAC DC        0           ADDRESS UNDER TEST
01B6 0  0000             RSLAD DC        /0000
01B7 0  FFFF             RSLAE DC        /FFFF
01B8 0  8000             RSLAF DC        /8000       BIT PATTERN UNDER TEST
01B9 0  0000             RSLAG DC        0           HIGHEST ADDR TO TEST 9
01BA 0  0001             RSLAH DC        1
01BB 0  8000             RSLAI DC        /8000       INITIALIZE BIT PATTE N
01BC 0  0800             RSLAJ DC        /0800       INITIALIZE MEMORY SIZE
```

```
                        *                                                       0-901360
                        *  STORAGE PROTECT TEST                                 0-901370
                        *                                                       0-901380
01BD 00 C4000187    RSSPT LD   L  RSLAE       ACC=/FFFF                       0-901390
01BF 00 D4000003          STO  L  3                                             0-901400
01C1 0  6300              LDX  X3 0                                             0-901410
01C2 00 C4000003          LD   L  3                                             0-901420
01C4 00 4C1801E6          BSC  L  RSPER,+-                                      0-901430
01C6 0  C0EF        RSR05 LD       RSLAD      ACC=/0000                       0-901440
01C7 00 D4800185          STO  I  RSLAC                                         0-901450
01C9 0  2CC1              DC      /2CC1      STORAGE PRT-IA                  0-901460
01CA 0  0185              DC      RSLAC                                         0-901470
01CB 0  C0EC              LD      RSLAF      ACC=/FFFF                       0-901480
01CC 00 D4800185          STO  I  RSLAC                                         0-901490
01CE 00 C4800185          LD   I  RSLAC                                         0-901500
01D0 00 4C180105          BSC  L  RSQ05,+-                                      0-901510
01D2 00 44000202          BSI  L  RSEOR                                         0-901520
01D4 0  70F1              MDX     RSR05                                         0-901530
01D5 00 44000238    RSQ05 BSI  L  RSLOP                                         0-901540
01D7 0  2CC0        RSR06 DC      /2CC0      CLEAR SP-IA                     0-901550
01D8 0  0185              DC      RSLAC                                         0-901560
01D9 0  C0DE              LD      RSLAF      ACC=/FFFF                       0-901570
01DA 00 D4800185          STO  I  RSLAC                                         0-901580
01DC 00 C4800185          LD   I  RSLAC                                         0-901590
01DE 0  F0D9              EOR     RSLAF                                         0-901600
01DF 00 4C1801F4          BSC  L  RSQ06,+-                                      0-901610
01E1 00 44000202          BSI  L  RSEOR                                         0-901620
01E3 0  70F3              MDX     RSR06                                         0-901630
01E4 00 44000238    RSQ06 BSI  L  RSLOP                                         0-901640
                        *                                                       0-901650
                        *  PROGRAM END ROUTINE                                  0-901660
                        *                                                       0-901670
01E6 00 74FF0231    RSPER MDX  L  RSPPC,-1    COUNT PRGM PASSES               0-901680
01E8 0  708C              MDX     RSR01                                         0-901690
01E9 0  C010              LD      RSRSX                                         0-901700
01EA 00 D4000008          STO  L  /8                                            0-901710
                        *                                                       0-901720
                        *  WAIT TO TURN DISABLE INTERRUPT SWITCH                0-901730
                        *  TO OFF POSITION-1800 ONLY                            0-901740
                        *                                                       0-901750
01EC 0  1000        WAITB SLA      0          ENABLE INTERRUPTS               0-901760
01ED 0  083B        RSPES XIO      RSBSB      REPEAT PROG IF SW 14 ON         0-901770
01EE 0  C03A              LD       RSBSB                                       0-901780
01EF 0  F03F              AND      RSB14                                       0-901790
01F0 00 4C20012F          BSC  L   RSSTA,Z                                     0-901800
01F2 0  C036              LD       RSBSB                                       0-901810
01F3 0  F03C              AND      RSB15                                       0-901820
01F4 00 4C2001FB          BSC  L   RSHOP,Z                                     0-901830
01F6 00 64000050    RSFIN LDX  L   /0050      LINK TO NEXT PROG               0-901840
01F8    0000              BSS  E   0                                           0-901850
01F8 0  0000        RSSIC DC       0                                           0-901860
01F9 0  0300              DC       /0300                                       0-901870
01FA 0  01FE        RSRSX DC       RSRSI                                       0-901880
01FB 0  3000        RSHOP WAIT                                                 0-901890
01FC 00 6400012F    RSBTB LDX  L   RSSTA                                       0-901900
01FE 0  0000        RSRSI DC       0                                           0-901910
01FF 0  08F8              XIO      RSSIC                                       0-901920
0200 00 4C4001ED          BOSC L   RSPES                                       0-901930
                        *                                                       0-901940
                        *  ERROR ROUTINE                                        0-901950
                        *                                                       0-901960
0202 0  0000        RSEOR DC       /0000      RETURN ADDRESS FOR E ROR        0-901970
0203 0  D026              STO      RSARB                                       0-901980
0204 0  0821              XIO      RSRBS      SENSE SW 11 FOR SCOP NG LO      0-901990
0205 0  C023              LD       RSBSB                                       0-902000
0206 0  E025              AND      RSB11                                       0-902010
0207 00 4C18020B          BSC  L   RSSBT,+-   CONTINUE IF 11 OFF               0-902020
0209 00 4C800202          BSC  I   RSEOR                                       0-902030
```



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020B 0  C01D        RSSBT LD       RSBSB      SENSE SW 12 FOR HALT ON E       0-902040
020C 0  C01C              LD       RSBSB                                       0-902050
020D 0  E01F              AND      RSB12                                       0-902060
020E 00 4C080212          BSC  L   RSHOE,+                                     0-902070
0210 00 4C800202          BSC  I   RSEOR                                       0-902080
0212 00 C4000185    RSHOE LD   L   RSLAC                                       0-902090
0214 0  E01F              AND      RSCON                                       0-902100
0215 0  E81D              OR       RSWAT                                       0-902110
0216 0  0005              STO      RSERW                                       0-902120
0217 0  C0EA              LD       RSEOR                                       0-902130
0218 00 940001BA          S    L   RSLAH                                       0-902140
021A 0  1890              SRT      16         LOAD I IN Q                     0-902150
021B 0  C00E              LD       RSARB                                       0-902160
021C 0  3000        RSERW WAIT                                                 0-902170
021D 00 4C800202          BSC  I   RSEOR                                       0-902180
021F 0  C017        RSILC LD       RSALT                                       0-902190
0220 0  3000        RSWSC WAIT                                                 0-902200
0221 00 6400012F          LDX  L   RSSTA                                       0-902210
                        *                                                       0-902220
                        *  STORAGE AREAS-2                                      0-902230
                        *                                                       0-902240
0224    0002              BSS  E   2                                           0-902250
0226 0  0229        RSRBS DC       RSBSB                                       0-902260
0227 0  3A40              DC       /3A40                                       0-902270
0228 0  0000        RSBAB DC       0                                           0-902280
0229 0  0000        RSBSB DC       0          BIT SWITCH BUFFER               0-902290
022A 0  0000        RSARB DC       0          SAVE A REG BUFFER               0-902300
022B 0  0020        RSB10 DC       /0020                                       0-902310
022C 0  0010        RSB11 DC       /0010                                       0-902320
022D 0  0008        RSB12 DC       /0008                                       0-902330
022E 0  0004        RSB13 DC       /0004                                       0-902340
022F 0  0002        RSB14 DC       /0002                                       0-902350
0230 0  0001        RSB15 DC       /0001                                       0-902360
0231 0  0000        RSPPC DC       0                                           0-902370
0232 0  0032        RSNPP DC       50                                          0-902380
0233 0  3000        RSWAT DC       /3000                                       0-902390
0234 0  0FFF        RSCON DC       /0FFF                                       0-902400
0235 0  0028        RSKXA DC       /0028                                       0-902410
0236 0  0020        RSKXB DC       /0020                                       0-902420
0237 0  5555        RSALT DC       /5555                                       0-902430
                        *                                                       0-902440
                        *  CHECK SWITCH 13 TO LOOP ON ROUTINE                   0-902450
                        *                                                       0-902460
0238 0  0000        RSLOP DC       0                                           0-902470
0239 00 C4000185          LD   L   RSLAC                                       0-902480
023B 00 F4000189          EOR  L   RSLAG                                       0-902490
023D 00 4C180249          BSC  L   RSCSE,+-                                    0-902500
023F 00 C4000185          LD   L   RSLAC                                       0-902510
0241 00 940001BA          A    L   RSLAH                                       0-902520
0243 00 D4000185          STO  L   RSLAC                                       0-902530
0245 00 74FD0238          MDX  L   RSLOP,-3                                    0-902540
0247 00 4C800238          BSC  I   RSLOP                                       0-902550
0249 00 C4000184    RSCSE LD   L   RSLAA       LOAD LOWEST ADDRESS             0-902560
024B 00 D4000185          STO  L   RSLAC                                       0-902570
024D 0  08D8              XIO      RSRBS      READ SW 13 TO LOOP R UTINE      0-902580
024E 0  C0DA              LD       RSBSB                                       0-902590
024F 0  E0DE              AND      RSB13                                       0-902600
0250 00 4C980238          BSC  I   RSLOP,+-                                    0-902610
0252 00 74FD0238          MDX  L   RSLOP,-3                                    0-902620
0254 00 4C800238          BSC  I   RSLOP                                       0-902630
                        ********************************************          0-902640
                        *                LOG ROUTINE               *          0-902650
                        ********************************************          0-902660
                        *                                                       0-902670
0256 0  0000        LOG   DC       0                                  SE       0-902680
0257 0  6B1B        LOG01 STX    3 LOG06+1    SAVE IX 3                       0-902690
0258 00 0C000226          XIO  L   RSRBS                                       0-902700
025A 00 C4000229          LD   L   RSBSB                                       0-902710
```

CORE STORAGE FUNCTION TEST
0-9 CORE TEST

```
025C 00 4C100278          BSC  L  TWRTR,-     BRANCH IF 1053 OUTPU      0-902720
                          *                                             0-902730
025E 00 C4800256          LD   I  LOG         GET MESSAGE ADDRESS       0-902740
0260 0  0051              STO     PRWRT       SET IN IOCC               0-902750
                          *                                             0-902760
0261 0  084C        LOG02 XIO     PRSNS       CHECK PRINTER READY       0-902770
0262 00 4C040268          BSC  L  LOG03,E     BRANCH IF NOT READY       0-902780
0264 0  1801              SRA     1                                     0-902790
0265 00 4C04026A          BSC  L  LOG04,E     BRANCH IF BUSY            0-902800
0267 0  7004              MDX     LOG05       READY AND NOT BUSY        0-902810
                          *                                             0-902820
0268 0  300A        LOG03 WAIT    10          NOT READY                 0-902830
0269 0  70F7              MDX     LOG02       CHECK AGAIN               0-902840
                          *                                             0-902850
026A 0  300B        LOG04 WAIT    11          BUSY                      0-902860
026B 0  70F5              MDX     LOG02       CHECK AGAIN               0-902870
                          *                                             0-902880
026C 0  0845        LOG05 XIO     PRWRT       OUTPUT MESSAGE            0-902890
                          *                                             0-902900
026D 0  0842              XIO     PRSN        CHECK FOR OP COMPLT       0-902910
026E 0  1002              SLA     2                                     0-902920
026F 0  4810              BSC     -                                     0-902930
0270 0  70FC              MDX     *-4                                   0-902940
0271 0  983C              XIO     PRSNS       RESET DSW                 0-902950
                          *                                             0-902960
                          *          PRINTING COMPLETE                  0-902970
                          *                                             0-902980
0272 00 67000000    LOG06 LDX  L3 0           RESTORE IX 3              0-902990
0274 00 74010256          MDX  L  LOG,1       BUMP RETURN               0-903000
                          *                                             0-903010
0276 00 4C800256          BSC  I  LOG         RETURN TO USER       SX   0-903020
                          *                                             0-903030
0278 0  1010        TWRTR SLA     16                                    0-903040
0279 0  0032              STO     WRDSW                                 0-903050
027A 0  0839              XIO     TWSNS       CHECK IF TYPEWRITER       0-903060
027B 0  1005              SLA     5           READY                     0-903070
027C 0  180F              SRA     15                                    0-903080
027D 00 4C180281          BSC  L  TWR01,+-                              0-903090
                          *                                             0-903100
027F 0  300C              WAIT    12          NOT READY                 0-903110
0280 0  70F9              MDX     TWRTR+2                               0-903120
                          *                                             0-903130
0281 0  C028        TWR01 LD      TWRTO       CARRAIGE RETURN AND       0-903140
0282 0  002A              STO     IOARA       LINE SPACE TO IO ARA      0-903150
                          *                                             0-903160
0283 0  0832              XIO     TWWRT       CARG RETURN/LINE SP       0-903170
                          *                                             0-903180
0284 0  082F              XIO     TWSNS       HANG TILL NOT BUSY        0-903190
0285 0  180B              SRA     11                                    0-903200
0286 0  4804              BSC     E                                     0-903210
0287 0  70FC              MDX     *-4                                   0-903220
                          *                                             0-903230
0288 0  6301              LDX  3  1           BYPASS 1443 WORD COU T    0-903240
0289 00 C4800256          LD   I  LOG         GET MESSAGE ADDRESS       0-903250
028B 0  0001              STO     TWR02+1                               0-903260
                          *                                             0-903270
028C 00 C7000000    TWR02 LD   L3 0           GET WORD TO PRINT         0-903280
028E 00 040002E8          STO  L  CODWD       SET IN CONVERSION RT      0-903290
0290 0  F01A              EOR     TWRT1       CHECK IF TERMINATOR       0-903300
0291 00 4C180272          BSC  L  LOG06,+-    BRANCH IF TERMINATOR      0-903310
                          *                                             0-903320
                          ********************************************  0-903330
0293 00 44000288          BSI  L  CODCV       GO CONVERT 43 TO TW  SRC  0-903340
                          ********************************************  0-903350
                          *                                             0-903360
0295 00 C40002E8          LD   L  CODWD                                 0-903370
0297 0  0015              STO     IOARA                                 0-903380
                          *                                             0-903390
```


CORE STORAGE FUNCTION TEST
0-9 CORE TEST

```
                          *                                             0-903400
                          *          OUTPUT A CHARACTER                 0-903410
                          *                                             0-903420
0298 0  081D        XIOWR XIO     TWWRT       WRITE CHARACTER           0-903430
                          *                                             0-903440
0299 0  081A        XIOSN XIO     TWSNS       HANG ON BUSY              0-903450
029A 0  180B              SRA     11                                    0-903460
029B 0  4804              BSC     E                                     0-903470
029C 0  70FC              MDX     XIOSN       BUSY                      0-903480
                          *                                             0-903490
                          *          CHECK IF 1ST 1/2 WORD              0-903500
                          *                                             0-903510
029D 0  C00E              LD      WRDSW       GET 1/2 WORD SWITCH       0-903520
029E 0  4804              BSC     E                                     0-903530
029F 0  7006              MDX     TWR03       GO SET UP NEXT WORD       0-903540
                          *                                             0-903550
                          *          SET UP FOR 2ND 1/2 WORD            0-903560
                          *                                             0-903570
02A0 0  C00C              LD      IOARA                                 0-903580
02A1 0  1008              SLA     8           POSITION 2ND 1/2 WD       0-903590
02A2 0  000A              STO     IOARA                                 0-903600
02A3 00 740102AC          MDX  L  WRDSW,1     BUMP WORD SWITCH          0-903610
02A5 0  70F2              MDX     XIOWR       GO WRITE 2ND 1/2 WD       0-903620
                          *                                             0-903630
                          *          SET UP FOR NEXT WORD               0-903640
                          *                                             0-903650
02A6 0  7301        TWR03 MDX  3  1           NEXT WORD INDEX           0-903660
02A7 00 740102AC          MDX  L  WRDSW,1     BUMP WORD SWITCH          0-903670
02A9 0  70F2              MDX     TWR02       GO GET NEXT WORD          0-903680
                          *                                             0-903690
                          *          LOG  CONSTANTS                     0-903700
                          *                                             0-903710
02AA 0  8103        TWRTO DC      /8103       LINE SP/CARRAIGE RTN      0-903720
02AB 0  FFFF        TWRT1 DC      /FFFF       TERMINATOR                0-903730
02AC 0  0000        WRDSW DC      0           1/2 WORD SWITCH           0-903740
02AD 0  0000        IOARA DC      0           OUTPUT AREA               0-903750
                          *                                             0-903760
02AE    0000              BSS  E  0                                     0-903770
                          *                                             0-903780
02AE 0  0000        PRSNS DC      /0000       PRINTER  SENSE IOCC       0-903790
02AF 0  3701              DC      /3701                                 0-903800
02B0 0  0000        PRSN  DC      0           NON RESET SENSE           0-903810
02B1 0  3700              DC      /3700                                 0-903820
02B2 0  0000        PRWRT DC      /0000       PRINTER  WRITE IOCC       0-903830
02B3 0  3500              DC      /3500                                 0-903840
02B4 0  0000        TWSNS DC      /0000       TYPEWTR  SENSE IOCC       0-903850
02B5 0  0F01              DC      /0F01       DSW RESET            PMC1 0-903860
02B6 0  02AD        TWWRT DC      IOARA       TYPEWTR  WRITE IOCC      0-903870
02B7 0  0900              DC      /0900       WR TYPEWRITER        PM02 0-903880
                          *                                             0-903890
                          ********************************************  0-903900
                          *          1443 CODE TO 1816/1053  CODE     *  0-903910
                          *          CONVERSION ROUTINE                 0-903920
                          ********************************************  0-903930
                          *                                             0-903940
02B8 0  0000        CODCV DC      0                                SE   0-903950
02B9 0  6927              STX  1  CODC4+1     SAVE INDEX REGS           0-903960
02BA 0  6A28              STX  2  CODC4+3                               0-903970
02BB 0  6B29              STX  3  CODC4+5                               0-903980
                          *                                             0-903990
02BC 0  1010              SLA     16          CLEAR LEFT HALF WORD      0-904000
02BD 0  0028              STO     LHIND       *INDICATOR                0-904010
02BE 0  6300              LDX  3  0                                     0-904020
                          *                                             0-904030
02BF 0  C028        CODC1 LD      CODWD       GET WORD TO CONVERT       0-904040
02C0 0  1890              SRT     16          SET IN Q                  0-904050
02C1 0  C027              LD      LHIND                                 0-904060
02C2 0  4820              BSC     Z           SKIP IF LEFT HALF         0-904070
02C3 0  1088              SLT     8           POSITION RIGHT HALF       0-904080
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                        *
                                                                        0-904080
02C4 0  1010            SLA     16                                      0-904090
02C5 0  1084            SLT     4       ZONE TO ACCUM                   0-904100
02C6 0  0023            STO     CODOO                                   0-904110
02C7 00 658002EA        LDX     I1 CODOO        IX 1 = ZONE             0-904120
                        *                                               0-904130
02C9 0  1010            SLA     16                                      0-904140
02CA 0  1084            SLT     4       DIGIT TO ACCUM                  0-904150
02CB 0  D01E            STO     CODOO                                   0-904160
02CC 00 668002EA        LDX     I2 CODOO        IX 2 = DIGIT            0-904170
                        *                                               0-904180
02CE 00 C50002ED        LD      L1 ZONE         GET ZONE TABLE ADDRS    0-904190
02D0 0  D001            STO     CODC2+1         SET IN CONVERSION WD    0-904200
                        *                                               0-904210
02D1 00 C6000000  CODC2 LD      L2 0            GET CONVERTED CODE      0-904220
02D3 00 D70002EB        STO     L3 CODO1                                0-904230
                        *                                               0-904240
02D5 0  C013            LD      LHIND                                   0-904250
02D6 00 4C2002DC        BSC  L  CODC3,Z         BRNCH IF RIGHT HALF     0-904260
02D8 00 740102E9        MDX  L  LHIND,1                                 0-904270
02DA 0  7301            MDX     3 1                                     0-904280
02DB 0  70E3            MDX     CODC1           GO CONVERT RIGHT HLF    0-904290
                        *                                               0-904300
02DC 0  C00E      CODC3 LD      CODO1           PACK CONVERTED CODES    0-904310
02DD 0  1008            SLA     8                                       0-904320
02DE 0  E80D            OR      CODO2                                   0-904330
02DF 0  D008            STO     CODWD                                   0-904340
                        *                                               0-904350
02E0 00 65000000  CODC4 LDX     L1 0            RESTORE INDEX REGS      0-904360
02E2 00 66000000        LDX     L2 0                                    0-904370
02E4 00 67000000        LDX     L3 0                                    0-904380
                        *                                               0-904390
02E6 00 4C8002R8        BSC  I  CODCV           RETURN TO USER      SX  0-904400
                        *                                               0-904410
                        *                                               0-904420
                        *                       CONSTANTS               0-904430
                        *                                               0-904440
02E8 0  0000      CODWD DC      0               WORD LOCATION           0-904450
02E9 0  0000      LHIND DC      0               LEFT HALF INDICATOR     0-904460
02EA 0  0000      CODOO DC      0               WORK AREA               0-904470
02EB 0  0000      CODO1 DC      0               CONVERTED LH CHARACT    0-904480
02EC 0  0000      CODO2 DC      0               CONVERTED RH CHARACT    0-904490
                        *                                               0-904500
                        *                                               0-904510
                        *                   1443 TO 1816/1053  CODE     0-904520
                        *                   CONVERSION TABLES           0-904530
                        *                                               0-904540
02ED 0  02F1      ZONE  DC      ZONEN           NO ZONE                 0-904550
02EE 0  02FC            DC      ZONE1           0 ZONE                  0-904560
02EF 0  0307            DC      ZONE2           11 ZONE                 0-904570
02F0 0  0311            DC      ZONE3           12 ZONE                 0-904580
                        *                                               0-904590
02F1 0  0021      ZONEN DC      /0021           SPACE                   0-904600
02F2 0  00FC            DC      /00FC           1                       0-904610
02F3 0  00D8            DC      /00D8           2                       0-904620
02F4 0  00DC            DC      /00DC           3                       0-904630
02F5 0  00F0            DC      /00F0           4                       0-904640
02F6 0  00F4            DC      /00F4           5                       0-904650
02F7 0  00D0            DC      /00D0           6                       0-904660
02F8 0  00D4            DC      /00D4           7                       0-904670
02F9 0  00E4            DC      /00E4           8                       0-904680
02FA 0  00E0            DC      /00E0           9                       0-904690
02FB 0  00C4            DC      /00C4           0                       0-904700
02FC 0  0000      ZONE1 DC      0                                       0-904710
02FD 0  0000            DC      0                                       0-904720
02FE 0  009A            DC      /009A           S                       0-904730
02FF 0  009E            DC      /009E           T                       0-904740
0300 0  00B2            DC      /00B2           U                       0-904750
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0301 0  0086            DC      /00B6           V                       0-904760
0302 0  0092            DC      /0092           W                       0-904770
0303 0  0096            DC      /0096           X                       0-904780
0304 0  00A6            DC      /00A6           Y                       0-904790
0305 0  00A2            DC      /00A2           Z                       0-904800
0306 0  0021            DC      /0021           SPACE                   0-904810
0307 0  0000      ZONE2 DC      0                                       0-904820
0308 0  007E            DC      /007E           J                       0-904830
0309 0  005A            DC      /005A           K                       0-904840
030A 0  005E            DC      /005E           L                       0-904850
030B 0  0072            DC      /0072           M                       0-904860
030C 0  0076            DC      /0076           N                       0-904870
030D 0  0052            DC      /0052           O                       0-904880
030E 0  0056            DC      /0056           P                       0-904890
030F 0  0066            DC      /0066           Q                       0-904900
0310 0  0062            DC      /0062           R                       0-904910
0311 0  0000      ZONE3 DC      0                                       0-904920
0312 0  003E            DC      /003E           A                       0-904930
0313 0  001A            DC      /001A           B                       0-904940
0314 0  001E            DC      /001E           C                       0-904950
0315 0  0032            DC      /0032           D                       0-904960
0316 0  0036            DC      /0036           E                       0-904970
0317 0  0012            DC      /0012           F                       0-904980
0318 0  0016            DC      /0016           G                       0-904990
0319 0  0026            DC      /0026           H                       0-905000
031A 0  0022            DC      /0022           I                       0-905010
0318 0  0086            DC      /0086           0 ERROR                 0-905020
031C 0  0000            DC      /0000           PERIOD                  0-905030
                        *                                               0-905040
031D 0  000A      MES12 DC      10              WD CT                   0-905050
031E 0  2435            DC      /2435           ME                      0-905060
031F 0  2426            DC      /2426           MO                      0-905070
0320 0  2918            DC      /2918           RY                      0-905080
0321 0  000A            DC      /000A           0                       0-905090
0322 0  0013            DC      /0013           T                       0-905100
0323 0  3829            DC      /3829           HR                      0-905110
0324 0  1400            DC      /1400           U                       0-905120
0325 0  0900            DC      /0900           9                       0-905130
0326 0  3326            DC      /3326           CO                      0-905140
0327 0  2935            DC      /2935           RE                      0-905150
0328 0  FFFF            DC      /FFFF           TERM                    0-905160
                        *                                               0-905170
0329 0  000B      MES13 DC      11              WD CT                   0-905180
032A 0  2729            DC      /2729           PR                      0-905190
032B 0  2637            DC      /2637           OG                      0-905200
032C 0  0035            DC      /0035           E                       0-905210
032D 0  2534            DC      /2534           ND                      0-905220
032E 0  000A            DC      /000A           0                       0-905230
032F 0  0013            DC      /0013           T                       0-905240
0330 0  3829            DC      /3829           HR                      0-905250
0331 0  1400            DC      /1400           U                       0-905260
0332 0  0900            DC      /0900           9                       0-905270
0333 0  3326            DC      /3326           CO                      0-905280
0334 0  2935            DC      /2935           RE                      0-905290
0335 0  FFFF            DC      /FFFF           TERM                    0-905300
                        *                                               0-905310
0336 0  0003      MES14 DC      3               WD CT                   0-905320
0337 0  3529            DC      /3529           ER                      0-905330
0338 0  2926            DC      /2926           RO                      0-905340
0339 0  2900            DC      /2900           R                       0-905350
033A 0  FFFF            DC      /FFFF           TERM                    0-905360
033C    012C            END     RSSTB                                   0-905370
```

CORE STORAGE FUNCTION TEST
0-9 CORE TEST

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
CODCV	02B8	0293,02E6
CODC1	02BF	02DB
CODC2	02D1	02DO
CODC3	02DC	02D6
CODC4	02E0	02B9,02BA,02BB
CODWD	02E8	028E,0295,028F,02DF
CODOO	02EA	02C6,02C7,02CB,02CC
CODO1	02EB	02D3,02DC
CODO2	02EC	02DE
IOARA	02AD	0282,0297,02A0,02A2,02B6
LHIND	02E9	028D,02C1,02D5,02D8
LOG	0256	025E,0274,0276,0289
LOG01	0257	
LOG02	0261	0269,026B
LOG03	0268	0262
LOG04	026A	0265
LOG05	026C	0267
LOG06	0272	0257,0291
MES12	031D	
MES13	0329	
MES14	0336	
PRSN	02BC	026D
PRSNS	02AE	0261,0271
PRWRT	02B2	0260,026C
RSAAN	0172	012C
RSALT	0237	021F
RSARB	022A	0203,021B
RSBAB	0228	
RSBIL	01AF	01AB
RSBSB	0229	01ED,01EE,01F2,0205,020B,020C,0226,024E,025A
RSBTB	01FC	
RSB10	022B	
RSB11	022C	0206
RSB12	022D	020D
RSB13	022E	024F
RSB14	022F	01EF
RSB15	0230	01F3
RSCON	0234	0214
RSCSE	0249	023D
RSDMS	014E	013E
RSD18	016D	0143
RSEOP	0202	017C,0189,0196,01A5,01D2,01E1,0209,0210,0217,021D
RSERW	021C	0216
RSFIN	01F6	
RSHOE	0212	020E
RSHOP	01F8	01F4
RSILC	021F	
RSKBA	0154	0153
RSKBC	0153	016A
RSKBD	0165	0158
RSKXA	0235	
RSKXB	0236	
RSLAA	01B4	0135,0151,0154,015C,0165,0168,0249
RSLAB	01B3	015A
RSLAC	01B5	015E,0176,0178,0182,0184,018E,018F,0191,0193,019E, 01A0,01C7,01CA,01CC,01CE,01D8,01DA,01DC,0212,0239, 023F,0243,024B
RSLAD	01B6	0175,01C6
RSLAE	01B7	0137,0181,0186,01BD
RSLAF	01B8	019C,019D,01A2,01A8,01AA,01CB,01D9,01DE
RSLAG	01B9	0162,023B
RSLAH	01BA	0218,0241
RSLAI	01BB	0198
RSLAJ	01BC	0133
RSLAQ	01B2	0160

CORE STORAGE FUNCTION TEST
0-9 CORE TEST

RSLOP	0238	017F,018C,0199,01AF,01D5,01E4,0245,0247,0250,0252, 0254
RSNPP	0232	012F
RSPER	01E6	01C4
RSPES	01ED	0200
RSPPC	0231	0131,01E6
RSQ01	017F	017A
RSQ02	018C	0187
RSQ03	0199	0194
RSQ04	01A8	01A3
RSQ05	01D5	01D0
RSQ06	01E4	01DF
RSRBS	0226	0141,0204,024D,0258
RSRSI	01FE	01FA
RSRSX	01FA	01E9
RSR01	0175	017E,01E8
RSR02	0181	018B
RSR03	018E	0198
RSR04	019D	01A7,01AD
RSR05	01C6	01D4
RSR06	01D7	01E3
RSR18	016B	0140
RSSBT	020B	0207
RSSIC	01F8	01FF
RSSPT	018D	0181
RSSTA	012F	0172,01F0,01FC,0221
RSSTB	012C	033B
RST18	016C	0116
RSVBB	019B	01AE
RSWAT	0233	0215
RSWSC	0220	
RSZRO	016E	014E
TWRTR	0278	025C,0280
TWRTO	02AA	0281
TWRT1	02AB	0290
TWRO1	0281	027D
TWRO2	028C	028B,02A9
TWRO3	02A6	029F
TWSNS	02B4	0144,027A,0284,0299
TWWRT	02B6	0147,0283,0298
WAITA	0174	014A,0164
WAITB	01EC	014C
WAITO	016F	0149
WRDSW	02AC	0279,029D,02A3,02A7
XIOSN	0299	029C
XIOWR	0298	02A5
ZONE	02ED	02CE
ZONEN	02F1	02ED
ZONE1	02FC	02EE
ZONE2	0307	02EF
ZONE3	0311	02F0

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                        *                                                       LCT00020
                        *                                                       LCT00030
                        *                                                       LCT00040
                        *                                                       LCT00050
                        *  MEMORY TEST-LOW CORE                                 LCT00060
                        *                                                       LCT00070
                        *                                                       LCT00080
                             ABS                                                LCT00090
028C                         ORG     2048                                       LCT00100
0800 0  C821            RSDKR LDD     RSAAM                                     LCT00110
0801 00 0C000000             STD  L   0                                         LCT00120
0803 0  C81E            RSDKS LDD     RSAAM                                     LCT00130
0804 00 0C000004             STD  L   4                                         LCT00140
0806 0  C013                 LD       RSAAE       CLEAR Q REGISTER              LCT00150
0807 0  1890                 SRT      16                                        LCT00160
                        *                                                       LCT00170
                        *  MACHINE DETERMINATION ROUTINE                        LCT00180
                        *                                                       LCT00190
0808 0  C011                 LD       RSAAE                                     LCT00200
0809 00 D4000003             STO  L   3                                         LCT00210
080B 00 6700FFFF             LDX  L3  /FFFF                                     LCT00220
080D 00 C4000003             LD   L   3                                         LCT00230
080F 00 4C200813             BSC  L   RSAAB,Z                                   LCT00240
0811 0  C007                 LD       RSAAD                                     LCT00250
0812 0  7004                 MDX  X   1                                         LCT00260
0813 0  C004            RSAAB LD      RSAAC                                     LCT00270
0814 0  D007                 STO      RSAAK                                     LCT00280
0815 00 67000000             LDX  L3  /0000       CLEAR XR 3                    LCT00290
0817 0  7015                 MDX      RSA3A                                     LCT00300
                        *                                                       LCT00310
                        *  STORAGE AREAS FOR INITIALIZATIONS                    LCT00320
0818 0  0001            RSAAC DC      1           1130 CONSTANT                 LCT00340
0819 0  FFFE            RSAAD DC      -2          1800 CONSTANT                 LCT00350
081A 0  0000            RSAAE DC      0           CONSTANT ZERO                 LCT00360
081B 0  07FD            RSAAH DC      2045        HIGHEST ADR TO TEST           LCT00370
081C 0  0000            RSAAK DC      0           MACHINE TYPE                  LCT00380
081D 0  0003            RSFAA DC      3           NUMBER OF PROGRAM PA SES      LCT00390
081E 0  0000            RSFAB DC      0           PROGRAM PASS BUFFER           LCT00400
                        *                                                       LCT00410
                        *                                                       LCT00420
                        *  STORAGE AREAS PART 1                                 LCT00430
                        *                                                       LCT00440
081F 0  7003            RSAAL MDX  X  3                                         LCT00450
0820    0002                  BSS  E  2                                         LCT00460
0822 00 4C000803        RSAAM BSC  L  RSDKS       BOOTSTRAP BRANCH INS          LCT00470
0824 0  082A            RSQAF DC      RSQAL       READ BIT SWITCH IOCC          LCT00480
0825 0  3A40            RSQAD DC      /3A40       SECOND HALF IOCC-113          LCT00490
0826 0  0009            RSQAC DC      9           LOWEST ADDRESS TO TEST        LCT00500
0827 0  0901            RSQAD DC      RSCCA       INTERRUPT LEVEL ZERO VECT     LCT00510
0828 0  0000            RSQAE DC      0           WORK AREA                     LCT00520
0829 0  0240            RSQAP DC      /0240       SECOND HALF IOCC-180          LCT00530
082A 0  0900            RSQAL DC      0           BIT SWITCH BUFFER AREA        LCT00540
082B 0  0F03            RSQAU DC      /0F03       2ND HALF IOCC-1800 C W        LCT00550
082C 0  0902            RSQAV DC      /0902       2ND HALF IOCC-1800 TYPE       LCT00560
                        *                                                       LCT00570
                        *  INITIALIZE MASKS AND INTERRUPTS TO LEVEL ZERO        LCT00580
                        *  1800 ONLY                                            LCT00590
                        *                                                       LCT00600
082D 0  C0F1            RSABA LD      RSAAL       STORE BOOTSTRAP BRAN H AT     LCT00610
082E 00 D4000000              STO  L  0           LOCATION ZERO                 LCT00620
0830 0  C0EB                  LD      RSAAK                                     LCT00630
0831 00 4C04083E              BSC  L  RSABI,E     IF 1130-GO TO FIRST ROUTI     LCT00640
0833 0  C0F5                  LD      RSQAP       CHANGE SECOND HALF I CC       LCT00650
0834 0  D0F0                  STO     RSQAD       FOR 1800 READ BIT SW          LCT00660
0835 0  C0F1                  LD      RSQAD       INTERRUPT LEVEL ERRO  VECT    LCT00670
0836 00 D4000008              STO  L  8                                         LCT00680
0838 0  C0F2                  LD      RSQAU       DSW 1800                      LCT00690
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0839 00 D4000AAB              STO  L  TWSNS+1                    PR01  LCT00700
083B 0  C0F0                  LD      RSQAV       XIO WRITE 1800         LCT00710
083C 00 D4000AAD              STO  L  TWWRT+1                    PR02  LCT00720
                        *                                                LCT00730
                        *  FIRST ROUTINE-READ + WRITE IN MEMORY          LCT00740
                        *                                                LCT00750
083E 0  CODE            RSABI LD      RSFAA       INITIALIZE PROGRAM     LCT00760
083F 0  DODE                  STO     RSFAB       PASS COUNTER           LCT00770
0840 0  6204            RSABH LDX  X2 4           ADDRESSING PASSES      LCT00780
0841 00 65800826        RSABB LDX  I1 RSQAC                              LCT00790
0843 0  69E4            RSABC STX  1  RSQAE                              LCT00800
0844 0  C0E3                  LD      RSQAE                              LCT00810
0845 00 D4800828              STO  I  RSQAE                              LCT00820
0847 0  F0D3                  EOR     RSAAH                              LCT00830
0848 00 4C18084C              BSC  L  RSABD,+-                           LCT00840
084A 0  7101                  MDX  X1 1           INCR TO NEXT ADDRESS   LCT00850
084B 0  70F7                  MDX     RSABC                              LCT00860
084C 00 65800826        RSABD LDX  I1 RSQAC                              LCT00870
084E 0  69D9            RSABE STX  1  RSQAE                              LCT00880
084F 00 C4800828              LD   I  RSQAE                              LCT00890
0851 0  F0D6                  EOR     RSQAE                              LCT00900
0852 00 4C180861              BSC  L  RSABF,+-    ERROR 1 DETECTED       LCT00910
0854 00 D400080B              STO  L  RSQAN       STORE ACCUM FOR ERROR ROU  LCT00920
0856 00 0C000824              XIO  L  RSQAF                              LCT00930
0858 00 C400082A              LD   L  RSQAL                              LCT00940
085A 00 E4000948              AND  L  RSRAI                              LCT00950
085C 00 4C20084E              BSC  L  RSABE,Z                            LCT00960
085E 00 44000A32              BSI  L  RSDDD                              LCT00970
0860 0  FFFE                  DC      /FFFE       ERROR 1 CONSTANT       LCT00980
0861 0  08C2            RSABF XIO     RSQAF       READ BIT SWITCHES      LCT00990
0862 00 C400082A              LD   L  RSQAL                              LCT01000
0864 00 E4000948              AND  L  RSRAI       ISOLATE BIT SW 11      LCT01010
0866 00 4C20084E              BSC  L  RSABE,Z     IF BIT SW 11 ON-REPEAT AD  LCT01020
0868 0  C0BF                  LD      RSQAE                              LCT01030
0869 0  F0B1                  EOR     RSAAH                              LCT01040
086A 00 4C18086E              BSC  L  RSABG,+-                           LCT01050
086C 0  7101                  MDX  X1 1           INCR TO NEXT ADDRESS   LCT01060
086D 0  70E0                  MDX     RSABE                              LCT01070
086E 0  72FF            RSABG MDX  X2 -1          COUNT PASSES           LCT01080
086F 0  70D1                  MDX     RSABB                              LCT01090
0870 00 0C000824              XIO  L  RSQAF       REPEAT ROUTINE IF SW13 ON  LCT01100
0872 00 C400082A              LD   L  RSQAL                              LCT01110
0874 00 E4000946              AND  L  RSRAG                              LCT01120
0876 00 4C200840              BSC  L  RSABH,Z     REPEAT ADDRESSING RO TINE  LCT01130
                        *                                                LCT01140
                        *  SECOND ROUTINE                                LCT01150
                        *  BIT ISOLATION TEST-BIT BY BIT-ADRESS BY ADDRESS  LCT01160
                        *                                                LCT01170
0878 0  6304            RSABR LDX  X3 4           BIT ISOLATION PASSES   LCT01180
0879 00 C4000826        RSABP LD   L  RSQAC                              LCT01190
0878 0  D05A            RSABN STO     RSQAH                              LCT01200
087C 00 65800806              LDX  I1 RSQAH                              LCT01210
087E 0  C058                  LD      RSQAI                              LCT01220
087F 00 D4800806              STO  I  RSQAH                              LCT01230
0881 00 C4800806              LD   I  RSQAH                              LCT01240
0883 00 4C180892              BSC  L  RSABJ,+-    ERROR 2 DETECTED       LCT01250
0885 00 44000A32              BSI  L  RSDDD                              LCT01260
0887 0  FFFD                  DC      /FFFD       ERROR 2 CONSTANT       LCT01261
0888 00 D400080B              STO  L  RSQAN       STORE ACC FOR ERROR  OUTI  LCT01270
088A 00 0C000824              XIO  L  RSQAF                              LCT01280
088C 00 C400082A              LD   L  RSQAL                              LCT01290
088E 00 E4000948              AND  L  RSRAI                              LCT01300
0890 00 4C20087C              BSC  L  RSABN+1,Z                          LCT01310
0892 00 0C000824        RSABJ XIO     RSQAF       IF BIT SW 11 ON REPE T AD  LCT01330
0894 00 C400082A              LD   L  RSQAL                              LCT01340
0896 00 E4000948              AND  L  RSRAI                              LCT01350
0898 00 4C20087C              BSC  L  RSABN+1,Z                          LCT01360
089A 0  C03D                  LD      RSQAJ                              LCT01370
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CORE STORAGE FUNCTION TEST
LOW CORE TEST

```
089B 0  003D            STO     RSQAK                                   LCT01380
089C 0  C03C    RSABL   LD      RSQAK                                   LCT01390
089D 00 048008D6 RSABQ  STO  I  RSQAH                                   LCT01400
089F 00 668008D9        LDX  I2 RSQAK                                   LCT01410
08A1 00 C48008D6        LD   I  RSQAH                                   LCT01420
08A3 0  F035            EOR     RSQAK                                   LCT01430
08A4 00 4C180883        BSC  L  RSABK,+-   ERROR 3 DETECTED             LCT01440
08A6 00 048008D8        STO  L  RSQAN                                   LCT01450
08A8 00 0C000824        XIO  L  RSQAF                                   LCT01460
08AA 00 C400082A        LD   L  RSQAL                                   LCT01470
08AC 00 E4000948        AND  L  RSRAI                                   LCT01480
08AE 00 4C20089C        BSC  L  RSABL,Z                                 LCT01490
08B0 00 44000A32        BSI  L  RSDDD                                   LCT01500
08B2 0  FFFB            DC      /FFFB      ERROR 3 CONSTANT             LCT01510
08B3 00 0C000824 RSABK  XIO  L  RSQAF                                   LCT01520
08B5 00 C400082A        LD   L  RSQAL                                   LCT01530
08B7 00 E4000948        AND  L  RSRAI      ISOLATE BIT 11               LCT01540
08B9 00 4C20089C        BSC  L  RSABL,Z    IF BIT SW 11 ON-REPE T BI    LCT01550
08BB 0  C01D            LD      RSQAK                                   LCT01560
08BC 0  4804            BSC     E          IF ODD-BIT 15 IS REA HED     LCT01570
08BD 0  7003            MDX     RSABM      BRANCH TO INCRE ADR ROUTI    LCT01580
08BE 0  1801            SRA     1          INCREMENT BIT                LCT01590
08BF 0  0019            STO     RSQAK      POSITION BY ONE              LCT01600
08C0 0  70DC            MDX     RSABQ                                   LCT01610
08C1 0  C014    RSABM   LD      RSQAH      TEST FOR MEMORY END          LCT01620
08C2 00 E4000819        EOR  L  RSAAH                                   LCT01630
08C4 00 4C1808C9        BSC  L  RSABO,+-                                LCT01640
08C6 0  C00F            LD      RSQAH      INCREMENT TO TEST NE T       LCT01650
08C7 0  8012            A       RSQAM      MEMORY LOCATION              LCT01660
08C8 0  70B2            MDX     RSABN                                   LCT01670
08C9 0  73FF    RSABO   MDX  X3 -1         COUNT PASSES                 LCT01680
08CA 0  70AE            MDX     RSABP                                   LCT01690
08CB 00 0C000824        XIO  L  RSQAF                                   LCT01700
08CD 00 C400082A        LD   L  RSQAL                                   LCT01710
08CF 00 E4000946        AND  L  RSRAG                                   LCT01720
08D1 00 4C200878        BSC  L  RSABR,Z    REPEAT BIT ISOLATION         LCT01730
08D3 0  7008            MDX     RSACJ                                   LCT01740
                *                                                       LCT01750
                *  STOPAGE AREAS PART 2                                 LCT01760
                *                                                       LCT01770
08D4 0  0004    RSQAQ   DC      4          WORST CASE PASSES            LCT01780
08D5 0  0000    RSQAR   DC      0          WORST CASE PASS COUN         LCT01790
08D6 0  0000    RSQAH   DC      0          WORK AREA-ADR                LCT01800
08D7 0  0000    RSQAI   DC      0          CONST ZERO                   LCT01810
08D8 0  8000    RSQAJ   DC      /8000      BIT ZERO CONSTANT            LCT01820
08D9 0  0000    RSQAK   DC      0          WORK AREA-BIT                LCT01830
08DA 0  0001    RSQAM   DC      1          CONST 1                      LCT01840
08DB 0  0000    RSQAN   DC      0          STORAGE FOR ACCUM            LCT01850
                *                                                       LCT01860
                *  ESTABLISH WORST CASE PATTERN                         LCT01870
                *                                                       LCT01880
08DC 00 66000000 RSACJ  LDX  L2 /0000                                   LCT01890
08DE 00 6700FFFF        LDX  L3 /FFFF                                   LCT01900
08E0 0  C0F3            LD      RSQAQ      INITIALIZE WORST CAS         LCT01910
08E1 0  00F3            STO     RSQAR      PASS COUNTER                 LCT01920
08E2 00 74FF08D5 RSACK  MDX  L  RSQAR,-1   COUNT WORST CASE PAS ES      LCT01930
08E4 0  7001            MDX     RSACX                                   LCT01940
08E5 0  7053            MDX     RSACW                                   LCT01950
08E6 0  6AEF    RSACX   STX  2  RSQAH      COMPLEMENT XR2               LCT01960
08E7 0  C0EE            LD      RSQAH                                   LCT01970
08E8 00 F4000943        EOR  L  RSRAC                                   LCT01980
08EA 0  00EB            STO     RSQAH                                   LCT01990
08EB 00 668008D6        LDX  I2 RSQAH                                   LCT02000
08ED 0  68E8            STX  3  RSQAH      COMPLEMENT XR3               LCT02010
08EE 0  C0E7            LD      RSQAH                                   LCT02020
08EF 00 F4000943        EOR  L  RSRAC                                   LCT02030
08F1 0  00E4            STO     RSQAH                                   LCT02040
08F2 00 678008D6        LDX  I3 RSQAH                                   LCT02050
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CORE STORAGE FUNCTION TEST
LOW CORE TEST

```
08F4 00 C4000826        LD   L  RSQAC                                   LCT02060
08F6 0  004A            STO     RSRAA                                   LCT02070
08F7 0  C049    RSACB   LD      RSRAA                                   LCT02080
08F8 0  1806            SRA     6                                       LCT02090
08F9 0  0048            STO     RSRAB                                   LCT02100
08FA 0  1802            SRA     2                                       LCT02110
08FB 0  8046            A       RSRAB                                   LCT02120
08FC 00 4C040901        BSC  L  RSACA,E                                 LCT02130
08FE 00 6E800941        STX  I2 RSRAA                                   LCT02140
0900 0  7002            MDX     RSACD                                   LCT02150
0901 00 6F800941 RSACA  STX  I3 RSRAA                                   LCT02160
0903 0  C03D    RSACD   LD      RSRAA                                   LCT02170
0904 00 F4000818        EOR  L  RSAAH      TEST FOR MEMORY END          LCT02180
0906 00 4C180908        BSC  L  RSADB,+-                                LCT02190
0908 00 74010941        MDX  L  RSRAA,1    ADR=ADR+1                    LCT02200
090A 0  70EC            MDX     RSACB                                   LCT02210
                *                                                       LCT02220
                *  WORST CASE TEST  LOAD AND STORE  THEN                LCT02230
                *  COMPLEMENT AND REPEAT                                LCT02240
                *                                                       LCT02250
0908 00 65800826 RSADB  LDX  I1 RSQAC      LOAD STARTING ADR IN XR1     LCT02260
090D 0  6933    RSACL   STX  1  RSRAA                                   LCT02270
090E 0  C03B    RSACH   LD      RSRAJ      INITIALIZE COMPLEMENT CNTR   LCT02280
090F 0  00B     RSACH   STO     RSRAK                                   LCT02290
0910 00 C4800941 RSACG  LD   I  RSRAA                                   LCT02300
0912 00 4C200916        BSC  L  RSACE,Z                                 LCT02310
0914 0  F02E            EOR     RSRAC                                   LCT02320
0915 0  7010            MDX     RSACF                                   LCT02330
0916 0  F02C    RSACE   EOR     RSRAC                                   LCT02340
0917 00 4C180926        BSC  L  RSACF,+-   ERROR 4 DECTECTED            LCT02350
0919 00 D40008D8        STO  L  RSQAN                                   LCT02360
091B 00 0C000824        XIO  L  RSQAF                                   LCT02370
091D 00 C400082A        LD   L  RSQAL                                   LCT02380
091F 00 E4000948        AND  L  RSRAI                                   LCT02390
0921 00 4C20090E        BSC  L  RSACH,Z                                 LCT02400
0923 00 44000A32        BSI  L  RSDDD                                   LCT02410
0925 0  FFF7            DC      /FFF7      ERROR 4 CONSTANT             LCT02420
0926 00 D4800941 RSACF  STO  I  RSRAA                                   LCT02430
0928 00 74FE0943        MDX  L  RSRAK,-2                                LCT02440
092A 0  70E5            MDX     RSACG      BRANCH FOR COMPLEMEM  PAS    LCT02450
092B 00 0C000824        XIO  L  RSQAF                                   LCT02460
092D 00 C400082A        LD   L  RSQAL                                   LCT02470
092F 0  E018            AND     RSRAI      ISOLATE BIT SW 11            LCT02480
0930 00 4C20090E        BSC  L  RSACH,Z    IF BIT SW 11 ON-REPE T AD    LCT02490
0932 0  C00E            LD      RSRAA                                   LCT02500
0933 00 F400081B        EOR  L  RSAAH      TEST FOR MEMORY END          LCT02510
0935 00 4C1808E2        BSC  L  RSACK,+-                                LCT02520
0937 0  7101            MDX  X1 1          MEM ADR=ADR+1                LCT02530
0938 0  7004            MDX     RSACL                                   LCT02540
0939 00 0C000824 RSACW  XIO  L  RSQAF                                   LCT02550
093B 00 C400082A        LD   L  RSQAL                                   LCT02560
093D 0  E008            AND     RSRAG      LOOP ROUTINE IF SW 1  ON     LCT02570
093E 00 4C2008DC        BSC  L  RSACJ,Z                                 LCT02580
0940 0  7008            MDX     RSACV                                   LCT02590
                *                                                       LCT02600
                *  STORAGE AREAS PART 3                                 LCT02610
                *                                                       LCT02620
0941 0  0000    RSRAA   DC      0          WORK AREA-ADDRESS            LCT02630
0942 0  0000    RSRAB   DC      0          BUFFER AREA-WORST CASE PA    LCT02640
0943 0  FFFF    RSRAC   DC      /FFFF                                   LCT02650
0944 0  0000    RSRAE   DC      0          WORK AREA-ADDRESS            LCT02660
0945 0  0000    RSRAF   DC      0          CONST ZERO                   LCT02670
0946 0  0004    RSRAG   DC      /0004      BIT 13 ISOLATION CONST       LCT02680
0947 0  0002    RSRAH   DC      /0002      BIT 14 ISOLATION CON T       LCT02690
0948 0  0010    RSRAI   DC      /0010      BIT 11 ISOLATION CONST       LCT02700
0949 0  0020    RSRAX   DC      /0020      BIT 10 ISOLATION CON TANT    LCT02710
094A 0  0003    RSRAJ   DC      3                                       LCT02720
094B 0  0000    RSRAK   DC      0          COMPLEMENT PASS COUN ER      LCT02730
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                        *                                                       LCT02740
                        *  STORAGE PROTECTION TEST ROUTINES                     LCT02750
                        *                                                       LCT02760
094C 00 C400081C  RSACV LD   L  RSAAK                                           LCT02770
094E 00 4C080952        BSC  L  RSACU,+                                         LCT02780
0950 00 640009C1        LDX  L  RSADA       NOT 1800 BRANCH TO E D              LCT02790
                        *                                                       LCT02800
                        *  WRITE ZEROS ON PROTECTED AREA OF ONES                LCT02810
                        *                                                       LCT02820
0952 0  6204      RSACU LDX  X2 4           STORAGE PROTECT PASS S              LCT02830
0953 00 C4000826  RSACS LD   L  RSQAC                                           LCT02840
0955 0  D0EE            STO    RSRAE                                            LCT02850
0956 0  0008            STO    RSACO        INITIALIZE STS ADDRESS              LCT02860
0957 00 C4000A27        LD   L  RSSAH        TELL INTERRUPT ROUTI E TO           LCT02870
0959 00 D4000A25        STO  L  RSSAF        DISREGARD SP ERROR                  LCT02880
095B 0  C0E7      RSACN LD      RSRAC        ACC=/FFFF                           LCT02890
095C 00 D4800944        STO  I  RSRAE                                           LCT02900
095E 0  2C41            DC      /2C41        ADD SP BITS                         LCT02910
095F 0  0962      RSACO DC      RSEND+2                                          LCT02920
0960 00 65800944        LDX  I1 RSRAE                                           LCT02930
0962 0  C0E2            LD      RSRAF        ACCUM=0                             LCT02940
0963 00 D4800944        STO  I  RSRAE        STO SHOULD NOT OCCUR                LCT02950
0965 00 C4800944        LD   I  RSRAE                                           LCT02960
0967 0  F0DB            EOR     RSRAC                                           LCT02970
0968 00 4C180977        BSC  L  RSACM,+-     ERROR 5 DECTECTED                  LCT02980
096A 00 D4000A08        STO  L  RSQAN                                           LCT02990
096C 00 0C000824        XIO  L  RSQAF                                           LCT03000
096E 00 C400082A        LD   L  RSQAL                                           LCT03010
0970 00 E4000948        AND  L  RSRAI                                           LCT03020
0972 00 4C200958        BSC  L  RSACN,Z                                         LCT03030
0974 00 44000A32        BSI  L  RSDDO                                           LCT03040
0976 0  FFEF            DC      /FFEF        ERROR 5 CONSTANT                   LCT03050
0977 00 0C000824  RSACM XIO  L  RSQAF                                           LCT03060
0979 00 C400082A        LD   L  RSQAL                                           LCT03070
097B 0  E0CC            AND     RSRAI        ISOLATE BIT SW 11                  LCT03080
097C 00 4C200958        BSC  L  RSACN,Z      IF BIT SW 11 ON-REPE T AD          LCT03090
097E 0  C0C5            LD      RSRAE                                           LCT03100
097F 00 940008DA        A    L  RSQAM                                           LCT03110
0981 0  D0C2            STO     RSRAE                                           LCT03120
0982 0  D0DC            STO     RSACO                                           LCT03130
0983 00 F400081B        EOR  L  RSAAH                                           LCT03140
0985 00 4C200958        BSC  L  RSACN,Z      RETURN WITH ADR=ADR+               LCT03150
                        *                                                       LCT03160
                        *  UNPROTECT AND CLEAR MEMORY OF ONES                   LCT03170
                        *                                                       LCT03180
0987 00 C4000A26        LD   L  RSSAG        SERVICE STORAGE PROT CT            LCT03190
0989 00 D4000A25        STO  L  RSSAF                                           LCT03200
098B 00 C4000826        LD   L  RSQAC                                           LCT03210
098D 0  D0B6            STO     RSRAE                                           LCT03220
098E 0  0001            STO     RSALR        INITIALIZE STS ADDRE S             LCT03230
098F 0  2C40      RSACQ DC      /2C40        CLEAR SP BITS                      LCT03240
0990 0  0962      RSACR DC      RSEND+2                                          LCT03250
0991 00 65800944        LDX  I1 RSRAE                                           LCT03260
0993 0  C0B1            LD      RSRAF        ACC=/0000                          LCT03270
0994 00 D4800944        STO  I  RSRAE                                           LCT03280
0996 00 C4800944        LD   I  RSRAE                                           LCT03290
0998 00 4C1809A7        BSC  L  RSACP,+-     ERROR 6 DECTECTED                  LCT03300
099A 00 D40008DB        STO  L  RSQAN                                           LCT03310
099C 00 0C000824        XIO  L  RSQAF                                           LCT03320
099E 00 C400082A        LD   L  RSQAL                                           LCT03330
09A0 00 E4000948        AND  L  RSRAI                                           LCT03340
09A2 00 4C20098F        BSC  L  RSACQ,Z                                         LCT03350
09A4 00 44000A32        BSI  L  RSDDD                                           LCT03360
09A6 0  FFDF            DC      /FFDF        ERROR 6 CONSTANT                   LCT03370
09A7 00 0C000824  RSACP XIO  L  RSQAF        REPEAT LOOP IF SW 11 ON            LCT03380
09A9 00 C400082A        LD   L  RSQAL                                           LCT03390
09AB 0  E09C            AND     RSRAI                                           LCT03400
09AC 00 4C20098F        BSC  L  RSACQ,Z      REPEAT ADDRESS                     LCT03410
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09AF 0  C095            LD      RSRAE                                           LCT03420
09AF 00 840008DA        A    L  RSQAM                                           LCT03430
09B1 0  D092            STO     RSRAE                                           LCT03440
09B2 0  D0DD            STO     RSACR                                           LCT03450
09B3 00 F4000818        EOR  L  RSAAH                                           LCT03460
09B5 00 4C20098F        BSC  L  RSACQ,Z      BRANCH WITH ADR=ADR+               LCT03470
09B7 0  72FF            MDX     X2 -1                                           LCT03480
09B8 0  709A            MDX     RSACS        LOOP ROUTINE FOR 5 P SSES          LCT03490
09B9 00 0C000824        XIO  L  RSQAF        LOOP ROUTINE IF SW 13 ON           LCT03500
09BB 00 C400082A        LD   L  RSQAL                                           LCT03510
09BD 00 E4000946        AND  L  RSRAG                                           LCT03520
09BF 00 4C200952        BSC  L  RSACU,Z      REPEAT SP ROUTINE                  LCT03530
                        *                                                       LCT03540
                        *  COMMON PROGRAM END                                   LCT03550
                        *                                                       LCT03560
09C1 00 74FF081E  RSADA MDX  L  RSFAB,-1                                        LCT03570
09C3 0  700B            MDX     RSCCQ                                           LCT03580
09C4 00 0C000824        XIO  L  RSQAF                                           LCT03590
09C6 00 C400082A        LD   L  RSQAL                                           LCT03600
09C8 00 E4000947        AND  L  RSRAH                                           LCT03610
09CA 00 4C20083E        BSC  L  RSABI,Z      REPEAT PROG-SW 14 ON               LCT03620
09CC 0  30FF      RSEXI WAIT    -1           PROGRAM COMPLETED                  LCT03630
09CD 00 64000803        LDX  L  RSDKS        PRESS START TO RE-RUN PROG         LCT03640
09CF 00 64000840  RSCCQ LDX  L  RSABH        LOOP PROGRAM                       LCT03650
                        *                                                       LCT03660
                        *  INTERRUPT LEVEL ERROR ROUTINE                        LCT03670
                        *                                                       LCT03680
09D1 0  0000      RSCCA DC      0            RETURN ADDR TO MAIN  INE           LCT03690
09D2 0  D04C            STO     RSSAA        SAVE A                             LCT03700
09D3 0  2847            STS     RSCCE        STORE STATUS CARY+OF O             LCT03710
09D4 0  084D            XIO     RSSAC        SENSE ILSW FOR LEVEL ERROR         LCT03720
09D5 0  D04E            STO     RSSAD                                           LCT03730
09D6 00 4C4009D8        BOSC L  NEXT                                            LCT03740
09D8 00 0C000824  NEXT  XIO  L  RSQAF        TEST FOR THE ILLEGAL               LCT03750
09DA 00 C400082A        LD   L  RSQAL        SWITCH COMBINATION-SW 10           LCT03760
09DC 0  E052            AND     RSSAO        ON AND SW 12 OFF                   LCT03770
09DD 0  F052            EOR     RSSAP                                           LCT03780
09DE 00 4C180A48        BSC  L  RSDDK,+-     BRANCH IF ILLEGAL                  LCT03790
09E0 0  C043            LD      RSSAD        RESTORE STATUS OF ILSW             LCT03800
09E1 0  E046            AND     RSSAE        ISOLATE STGE PRT ERR R             LCT03810
09E2 00 4C1809F7        BSC  L  RSCCB,+-     TEST FOR STORAGE PROT VIOL         LCT03820
09E4 0  C040            LD      RSSAF                                           LCT03830
09E5 00 4C1009F3        BSC  L  RSCCG,-      BYPASS PRINTOUT IF IN SP           LCT03840
09E7 00 0C000824        XIO  L  RSQAF        SW 10 TO BYPASS PRIN OUT           LCT03850
09E9 00 C400082A        LD   L  RSQAL                                           LCT03860
09EB 00 E4000949        AND  L  RSRAX                                           LCT03870
09ED 00 4C200A0D        BSC  L  RSCCD,Z      BYPASS PRINTOUT IF BRANCH          LCT03880
09EF 00 44000A48        BSI  L  LOG                                             LCT03890
09F1 0  0825            DC      MES17        ERROR INT-STORG PROT               LCT03900
09F2 0  7004            MDX     RSCCB                                           LCT03910
09F3 0  C030      RSCCG LD      RSSAD        IF IN SP ROUTINE AN SP             LCT03920
09F4 0  F033            EOR     RSSAE        ERROR ONLY THEN RETU N TO          LCT03930
09F5 00 4C9809D1        BSC  I  RSCCA,+-     MAINLINE                           LCT03940
09F7 00 0C000824  RSCCB XIO  L  RSQAF        SW 10 TO BYPASS PRIN OUT           LCT03950
09F9 00 C400082A        LD   L  RSQAL                                           LCT03960
09FB 00 E4000949        AND  L  RSRAX                                           LCT03970
09FD 00 4C200A0D        BSC  L  RSCCD,Z      BYPASS PRINTOUT IF BRANCH          LCT03980
09FF 0  C024            LD      RSSAD        LOAD ILSW FOR ERROR  NTRUP         LCT03990
0A00 0  E028            AND     RSSAI        ISOLATE PARITY ERROR               LCT04000
0A01 00 4C180A06        BSC  L  RSCCC,+-                                        LCT04010
0A03 00 44000A48        BSI  L  LOG                                             LCT04020
0A05 0  0B31            DC      MES18        ERROR INT-PARITY                   LCT04030
0A06 0  C01D      RSCCC LD      RSSAD        TEST FOR INVALID OP CODE           LCT04040
0A07 0  E022            AND     RSSAJ        ISOLATE INV OP ERROR               LCT04050
0A08 00 4C180A0D        BSC  L  RSCCD,+-                                        LCT04060
0A0A 00 44000A48        BSI  L  LOG                                             LCT04070
0A0C 0  0B3B            DC      MES19        ERROR INT-INV OP CODE              LCT04080
0A0D 00 0C000824  RSCCD XIO  L  RSQAF        IF BIT SW 12 ON THEN STOR          LCT04090
```

CORE STORAGE FUNCTION TEST
LOW CORE TEST

```
0A0F 00 C400082A          LD   L  RSQAL                                LCT04100
0A11 0  E019              AND     RSSAK      ACCUM, INS CTR, STAT S    LCT04110
0A12 00 4C8809D1          BSC  I  RSCCA,+    AND WAIT                  LCT04120
0A14 0  C00F              LD      RSSAD      LOAD ILSW FOR ERROR       LCT04130
0A15 0  180C              SRA     12         PLACE BITS 0-4 OF ILSW IN LCT04140
0A16 0  E817              OR      RSSAN      11-15 AND OR IN WAIT OP   LCT04150
0A17 0  0004              STO     RSCCH      STORE IN WAIT             LCT04160
0A18 0  C088              LD      RSCCA      LOAD INS CTR IN ACCU      LCT04170
0A19 0  1890              SRT     16         TRANSFER INS CTR TO Q     LCT04180
0A1A 0  C004              LD      RSSAA      RESTORE ACCUM CONTEN S    LCT04190
0A1B 0  2000        RSCCE LDS     0          RESTORE OFLO+CARRY INDICA LCT04200
0A1C 0  3000        RSCCH WAIT                                         LCT04210
0A1D 00 4C8009D1          BSC  I  RSCCA      RETURN TO MAINLINE        LCT04220
                    *                                                  LCT04230
                    *  STORAGE AREAS FOR ERROR ROUTINES                LCT04240
                    *                                                  LCT04250
0A1F 0  0000        RSSAA DC      0          SAVED ACCUMULATOR BUFFER  LCT04260
0A20    0002              BSS   E 2                                    LCT04270
0A22 0  0000        RSSAC DC      /0000      SENSE ILSW FOR            LCT04280
0A23 0  0300              DC      /0300      LEVEL ZERO                LCT04290
0A24 0  0000        RSSAD DC      0          STORAGE FOR ILSW          LCT04300
0A25 0  FFFF        RSSAF DC      -1         IN SP ROUTINE -1NO,  YES  LCT04310
0A26 0  FFFF        RSSAG DC      -1         NOT IN SP ROUTINE         LCT04320
0A27 0  0002        RSSAH DC      2          IN STORAGE PROTECT R UTIN LCT04330
0A28 0  2000        RSSAE DC      /2000                                LCT04340
0A29 0  4000        RSSAI DC      /4000                                LCT04350
0A2A 0  8000        RSSAJ DC      /8000                                LCT04360
0A2B 0  0009        RSSAK DC      /0008      ISOLATE BIT SW 12         LCT04370
0A2C 0  000E        RSSAL DC      14                                   LCT04380
0A2D 0  0001        RSSAM DC      1                                    LCT04390
0A2E 0  3000        RSSAN DC      /3000      WAIT INSTRUCTION          LCT04400
0A2F 0  0028        RSSAO DC      /0028                                LCT04410
0A30 0  0020        RSSAP DC      /0020                                LCT04420
0A31 0  5555        RSSAQ DC      /5555                                LCT04430
                    *                                                  LCT04440
                    *  ERROR ROUTINE TO SERVICE NON-INTERRUPT ERR RS   LCT04450
                    *                                                  LCT04460
0A32 0  0000        RSDDD DC      0          STORAGE FOR RETURN A DRES LCT04470
0A33 0  2810              STS     RSDDJ      STORE STATUS OFLO+CARRY   LCT04480
0A34 0  C0FD        RSDDX LD      RSDDD                                LCT04490
0A35 0  90F6              S       RSSAL      CORRECT I REG             LCT04500
0A36 0  1890              SRT     16         STORE I REG IN Q          LCT04510
0A37 0  C0FA              LD      RSDDD                                LCT04520
0A38 0  80F4              A       RSSAM      INCREMENT RETURN ADD ESS  LCT04530
0A39 0  00F8              STD     RSDDD      BY 1 TO AVOID DC IN MAINL LCT04540
0A3A 00 0C000824          XIO  L  RSQAF      IF SW 12 ON-CORRECT  ONSL LCT04550
0A3C 00 C400082A          LD   L  RSQAL                                LCT04560
0A3E 00 E4000A2B          AND  L  RSSAK      INDICATOR LAMPS AND  AIT  LCT04570
0A40 00 4CA00A32          BSC  I  RSDDD,Z                              LCT04580
0A42 00 C40008D3          LD   L  RSQAN      RELOAD A REG AS PER  RROR LCT04590
0A44 0  2000        RSDDJ LDS     0          SAVE CARY+OFLO STATUS     LCT04600
0A45 0  3000              WAIT                                         LCT04610
0A46 00 4C800A32          BSC  I  RSDDD                                LCT04620
0A48 0  C0E8        RSDDK LD      RSSAQ                                LCT04630
0A49 00 4C400803          BOSC L  RSDKS      RESET INTER-RETURN S ART  LCT04640
                    *                                                  LCT04650
                    ********************************************     LCT04660
                    *                LOG ROUTINE                 *     LCT04670
                    ********************************************     LCT04680
                    *                                                  LCT04690
0A4B 0  0000        LOG   DC      0                                SE  LCT04700
0A4C 0  681B        LOG01 STX    3 LOG06+1    SAVE IX 3                 LCT04710
0A4D 00 0C000824          XIO  L  RSQAF                                LCT04720
0A4F 00 C400082A          LD   L  RSQAL                                LCT04730
0A51 00 4C100A6D          BSC  L  TWRTR,-    BRANCH IF 1053 OUTPU      LCT04740
                    *                                                  LCT04750
0A53 00 C4800A4B          LD   I  LOG        GET MESSAGE ADDRESS       LCT04760
0A55 0  0052              STO     PRWRT      SET IN IOCC               LCT04770
```


CORE STORAGE FUNCTION TEST
LOW CORE TEST

```
                    *                                                  LCT04780
0A56 0  084D        LOG02 XIO     PRSNS      CHECK PRINTER READY       LCT04790
0A57 00 4C040A5D          BSC  L  LOG03,E    BRANCH IF NOT READY       LCT04800
0A59 0  1901              SRA     1                                    LCT04810
0A5A 00 4C040A5F          BSC  L  LOG04,E    BRANCH IF BUSY            LCT04820
0A5C 0  7004              MDX     LOG05      READY AND NOT BUSY        LCT04830
                    *                                                  LCT04840
0A5D 0  300A        LOG03 WAIT    10         NOT READY                 LCT04850
0A5E 0  70F7              MDX     LOG02      CHECK AGAIN               LCT04860
                    *                                                  LCT04870
0A5F 0  300B        LOG04 WAIT    11         BUSY                      LCT04880
0A60 0  70F5              MDX     LOG02      CHECK AGAIN               LCT04890
                    *                                                  LCT04900
0A61 0  0846        LOG05 XIO     PRWRT      OUTPUT MESSAGE            LCT04910
                    *                                                  LCT04920
0A62 0  0843              XIO     PRSN       CHECK FOR OP COMPLT       LCT04930
0A63 0  1002              SLA     2                                    LCT04940
0A64 0  4810              BSC     -                                    LCT04950
0A65 0  70FC              MDX     *-4                                  LCT04960
0A66 0  093D              XIO     PRSNS      RESET DSW                 LCT04970
                    *                                                  LCT04980
                    *                PRINTING COMPLETE                 LCT04990
                    *                                                  LCT05000
0A67 00 67000000    LOG06 LDX  L3 0          RESTORE IX 3              LCT05010
0A69 00 74010A4B          MDX  L  LOG,1      BUMP RETURN               LCT05020
                    *                                                  LCT05030
0A6B 00 4C800A4B          BSC  I  LOG        RETURN TO USER        SX  LCT05040
                    *                                                  LCT05050
0A6D 0  1010        TWRTR SLA     16                                   LCT05060
0A6E 0  0032              STO     WRDSW                                LCT05070
0A6F 0  093A              XIO     TWSNS      CHECK IF TYPEWRITER       LCT05080
0A70 0  1005              SLA     5          READY                     LCT05090
0A71 0  180F              SRA     15                                   LCT05100
0A72 00 4C180A76          BSC  L  TWRO1,+-                             LCT05110
                    *                                                  LCT05120
0A74 0  300C              WAIT    12         NOT READY                 LCT05130
0A75 0  70F9              MDX     TWRTR+2                              LCT05140
                    *                                                  LCT05150
0A76 0  C028        TWRO1 LD      TWRTO      CARRAIGE RETURN AND       LCT05160
0A77 0  D02A              STO     IOARA      LINE SPACE TO ID ARA      LCT05170
                    *                                                  LCT05180
0A78 0  0833              XIO     TWWRT      CARG RETURN/LINE SP       LCT05190
                    *                                                  LCT05200
0A79 0  0830              XIO     TWSNS      HANG TILL NOT BUSY        LCT05210
0A7A 0  180B              SRA     11                                   LCT05220
0A7B 0  4804              BSC     E                                    LCT05230
0A7C 0  70FC              MDX     *-4                                  LCT05240
                    *                                                  LCT05250
0A7D 0  6301              LDX     3 1        BYPASS 1443 WORD COU T    LCT05260
0A7E 00 C4800A4B          LD   I  LOG        GET MESSAGE ADDRESS       LCT05270
0A80 0  0001              STO     TWRO2+1                              LCT05280
                    *                                                  LCT05290
0A81 00 C7000000    TWRO2 LD   L3 0          GET WORD TO PRINT         LCT05300
0A83 00 D4000ADE          STO  L  CODWD      SET IN CONVERSION RT      LCT05310
0A85 0  F01A              EOR     TWRT1      CHECK IF TERMINATOR       LCT05320
0A86 00 4C180A67          BSC  L  LOG06,+-   BRANCH IF TERMINATOR      LCT05330
                    *                                                  LCT05340
                    ********************************************     LCT05350
0A88 00 44000AAE          BSI  L  CODCV      GO CONVERT 43 TO TW   >RC  LCT05360
                    ********************************************     LCT05370
                    *                                                  LCT05380
0A8A 00 C4000ADE          LD   L  CODWD                                LCT05390
0A8C 0  D015              STO     IOARA                                LCT05400
                    *                                                  LCT05410
                    *                OUTPUT A CHARACTER                LCT05420
                    *                                                  LCT05430
0A8D 0  081E        XIOWR XIO     TWWRT      WRITE CHARACTER           LCT05440
                    *                                                  LCT05450
```

CORE STORAGE FUNCTION TEST
LOW CORE TEST

```
0A8E 0  081B      XIOSN XIO     TWSNS      HANG ON BUSY                LCT05460
0A8F 0  1808            SRA     11                                     LCT05470
0A90 0  4804            BSC     E                                      LCT05480
0A91 0  70FC            MDX     XIOSN      BUSY                        LCT05490
                *                                                      LCT05500
                *                    CHECK IF 1ST 1/2 WORD             LCT05510
                *                                                      LCT05520
0A92 0  C00E            LD      WRDSW      GET 1/2 WORD SWITCH         LCT05530
0A93 0  4804            BSC     E                                      LCT05540
0A94 0  7006            MDX     TWR03      GO SET UP NEXT WORD         LCT05550
                *                                                      LCT05560
                *                    SET UP FOR 2ND 1/2 WORD           LCT05570
                *                                                      LCT05580
0A95 0  C00C            LD      IOARA                                  LCT05590
0A96 0  1008            SLA     8          POSITION 2ND 1/2 WD         LCT05600
0A97 0  D00A            STO     IOARA                                  LCT05610
0A98 00 74010AA1        MDX  L  WRDSW,1    BUMP WORD SWITCH            LCT05620
0A9A 0  70F2            MDX     XIOWR      GO WRITE 2ND 1/2 WD         LCT05630
                *                                                      LCT05640
                *                    SET UP FOR NEXT WORD              LCT05650
                *                                                      LCT05660
0A9B 0  7301      TWR03 MDX   3 1          NEXT WORD INDEX             LCT05670
0A9C 00 74010AA1        MDX  L  WRDSW,1    BUMP WORD SWITCH            LCT05680
0A9E 0  70E2            MDX     TWR02      GO GET NEXT WORD            LCT05690
                *                                                      LCT05700
                *                    LOG   CONSTANTS                   LCT05710
                *                                                      LCT05720
0A9F 0  8103      TWRTO DC      /8103      LINE SP/CARRAIGE RTN        LCT05730
0AA0 0  FFFF      TWRT1 DC      /FFFF      TERMINATOR                  LCT05740
0AA1 0  0000      WRDSW DC      0          1/2 WORD SWITCH             LCT05750
0AA2 0  0000      IOARA DC      0          OUTPUT AREA                 LCT05760
                *                                                      LCT05770
0AA4    0000            BSS  E  0                                      LCT05780
                *                                                      LCT05790
0AA4 0  0000      PRSNS DC      /0000      PRINTER  SENSE IOCC         LCT05800
0AA5 0  3701            DC      /3701                                  LCT05810
0AA6 0  0000      PRSN  DC      0          NON RESET SENSE             LCT05820
0AA7 0  3700            DC      /3700                                  LCT05830
0AA8 0  0000      PRWRT DC      /0000      PRINTER  WRITE IOCC         LCT05840
0AA9 0  3500            DC      /3500                                  LCT05850
0AAA 0  0000      TWSNS DC      /0000      TYPEWTR  SENSE IOCC         LCT05860
0AAB 0  0F01            DC      /0F01      DSW RESET            PM01  LCT05870
0AAC 0  0AA2      TWWRT DC      IOARA      TYPEWTR  WRITE IOCC         LCT05880
0AAD 0  0900            DC      /0900      WR TYPEWRITER        PM02  LCT05890
                *                                                      LCT05900
                ********************************************           LCT05910
                *                  1443 CODE TO 1816/1053   *          LCT05920
                *                  CODE CONVERSION ROUTINE  *          LCT05930
                ********************************************           LCT05940
                *                                                      LCT05950
0AAE 0  0000      CODCV DC      0                                SE    LCT05960
0AAF 0  6927            STX  1  CODC4+1    SAVE INDEX REGS             LCT05970
0AB0 0  6A28            STX  2  CODC4+3                                LCT05980
0AB1 0  6829            STX  3  CODC4+5                                LCT05990
                *                                                      LCT06000
0AB2 0  1010            SLA     16         CLEAR LEFT HALF WORD        LCT06010
0AB3 0  D028            STO     LHIND      *INDICATOR                  LCT06020
0AB4 0  6300            LDX  3  0                                      LCT06030
                *                                                      LCT06040
0AB5 0  C028      CODC1 LD      CODWD      GET WORD TO CONVERT         LCT06050
0AB6 0  1890            SRT     16         SET IN Q                    LCT06060
0AB7 0  C027            LD      LHIND                                  LCT06070
0AB8 0  4820            BSC     Z          SKIP IF LEFT HALF           LCT06080
0AB9 0  1088            SLT     8          POSITION RIGHT HALF         LCT06090
                *                                                      LCT06100
0ABA 0  1010            SLA     16                                     LCT06110
0ABB 0  1084            SLT     4          ZONE TO ACCUM               LCT06120
0ABC 0  D023            STO     CODOO                                  LCT06130
```


CORE STORAGE FUNCTION TEST
LOW CORE TEST

```
0ABD 00 65800AE0          LDX  I1 CODOO      IX 1 = ZONE                 LCT06140
                *                                                      LCT06150
0ABF 0  1010              SLA     16                                     LCT06160
0AC0 0  1084              SLT     4          DIGIT TO ACCUM              LCT06170
0AC1 0  D01E              STO     CODOO                                  LCT06180
0AC2 00 66800AE0          LDX  I2 CODOO      IX 2 = DIGIT                LCT06190
                *                                                      LCT06200
0AC4 00 C5000AE3          LD   L1 ZONE       GET ZONE TABLE ADDRS        LCT06210
0AC6 0  D001              STO     CODC2+1    SET IN CONVERSION WD        LCT06220
                *                                                      LCT06230
0AC7 00 C6000000  CODC2   LD   L2 0          GET CONVERTED CODE          LCT06240
0AC9 00 D7000AE1          STO  L3 CODO1                                  LCT06250
                *                                                      LCT06260
0ACB 0  C013              LD      LHIND                                  LCT06270
0ACC 00 4C200AD2          BSC  L  CODC3,Z    BRNCH IF RIGHT HALF         LCT06280
0ACE 00 74010ADF          MDX  L  LHIND,1                                LCT06290
0AD0 0  7301              MDX   3 1                                      LCT06300
0AD1 0  70E3              MDX     CODC1      GO CONVERT RIGHT HLF        LCT06310
                *                                                      LCT06320
0AD2 0  C00E      CODC3   LD      CODO1      PACK CONVERTED CODES        LCT06330
0AD3 0  1008              SLA     8                                      LCT06340
0AD4 0  E80D              OR      CODO2                                  LCT06350
0AD5 0  D008              STO     CODWD                                  LCT06360
                *                                                      LCT06370
0AD6 00 650000C0  CODC4   LDX  L1 0          RESTORE INDEX REGS          LCT06380
0AD8 00 66000000          LDX  L2 0                                      LCT06390
0ADA 00 67000000          LDX  L3 0                                      LCT06400
                *                                                      LCT06410
0ADC 00 4C800AAE          BSC  I  CODCV      RETURN TO USER         SX   LCT06420
                *                                                      LCT06430
                *                                                      LCT06440
                *                    CONSTANTS                         LCT06450
                *                                                      LCT06460
0ADE 0  0000      CODWD DC      0          WORD LOCATION               LCT06470
0ADF 0  0000      LHIND DC      0          LEFT HALF INDICATOR         LCT06480
0AE0 0  0000      CODOO DC      0          WORK AREA                   LCT06490
0AE1 0  0000      CODO1 DC      0          CONVERTED LH CHARACT        LCT06500
0AE2 0  0000      CODO2 DC      0          CONVERTED RH CHARACT        LCT06510
                *                                                      LCT06520
                *                                                      LCT06530
                *                    1443 TO 1816/1053  CODE           LCT06540
                *                    CONVERSION TABLES                 LCT06550
                *                                                      LCT06560
0AE3 0  0AE7      ZONE  DC      ZONEN      NO ZONE                     LCT06570
0AE4 0  0AF2            DC      ZONE1      0 ZONE                      LCT06580
0AE5 0  0AFD            DC      ZONE2      11 ZONE                     LCT06590
0AE6 0  0807            DC      ZONE3      12 ZONE                     LCT06600
                *                                                      LCT06610
0AE7 0  0021      ZONEN DC      /0021      SPACE                       LCT06620
0AE8 0  00FC            DC      /00FC      1                           LCT06630
0AE9 0  00D8            DC      /00D8      2                           LCT06640
0AEA 0  00DC            DC      /00DC      3                           LCT06650
0AEB 0  00F0            DC      /00F0      4                           LCT06660
0AEC 0  00F4            DC      /00F4      5                           LCT06670
0AED 0  00D0            DC      /00D0      6                           LCT06680
0AEE 0  00D4            DC      /00D4      7                           LCT06690
0AEF 0  00E4            DC      /00E4      8                           LCT06700
0AF0 0  00E0            DC      /00E0      9                           LCT06710
0AF1 0  00C4            DC      /00C4      0                           LCT06720
0AF2 0  0000      ZONE1 DC      0                                      LCT06730
0AF3 0  0000            DC      0                                      LCT06740
0AF4 0  009A            DC      /009A      S                           LCT06750
0AF5 0  009E            DC      /009E      T                           LCT06760
0AF6 0  00B2            DC      /00B2      U                           LCT06770
0AF7 0  00B6            DC      /00B6      V                           LCT06780
0AF8 0  0092            DC      /0092      W                           LCT06790
0AF9 0  0096            DC      /0096      X                           LCT06800
0AFA 0  00A6            DC      /00A6      Y                           LCT06810
```

CORE STORAGE FUNCTION TEST
LOW CORE TEST

```
0AFB 0 00A2          DC    /00A2    Z              LCT06820
0AFC 0 0021          DC    /0021    SPACE          LCT06830
0AFD 0 0000    ZONE2 DC    0                       LCT06840
0AFE 0 007E          DC    /007E    J              LCT06850
0AFF 0 005A          DC    /005A    K              LCT06860
0B00 0 005E          DC    /005E    L              LCT06870
0B01 0 0072          DC    /0072    M              LCT06880
0B02 0 0076          DC    /0076    N              LCT06890
0B03 0 0052          DC    /0052    O              LCT06900
0B04 0 0056          DC    /0056    P              LCT06910
0B05 0 0066          DC    /0066    Q              LCT06920
0B06 0 0062          DC    /0062    R              LCT06930
0B07 0 0000    ZONE3 DC    0                       LCT06940
0B08 0 003E          DC    /003E    A              LCT06950
0B09 0 001A          DC    /001A    B              LCT06960
0B0A 0 001E          DC    /001E    C              LCT06970
0B0B 0 0032          DC    /0032    D              LCT06980
0B0C 0 0036          DC    /0036    E              LCT06990
0B0D 0 0012          DC    /0012    F              LCT07000
0B0E 0 0016          DC    /0016    G              LCT07010
0B0F 0 0026          DC    /0026    H              LCT07020
0B10 0 0022          DC    /0022    I              LCT07030
0B11 0 0086          DC    /0086    0 ERROR        LCT07040
0B12 0 0000          DC    /0000    PERIOD         LCT07050
                     *                             LCT07060
0B13 0 000A    MES15 DC    10       WD CT          LCT07070
0B14 0 2435          DC    /2435    ME             LCT07080
0B15 0 2426          DC    /2426    MO             LCT07090
0B16 0 2918          DC    /2918    RY             LCT07100
0B17 0 0013          DC    /0013     T             LCT07110
0B18 0 3512          DC    /3512    ES             LCT07120
0B19 0 1300          DC    /1300    T              LCT07130
0B1A 0 2326          DC    /2326    LO             LCT07140
0B1B 0 1600          DC    /1600    W              LCT07150
0B1C 0 3326          DC    /3326    CO             LCT07160
0B1D 0 2935          DC    /2935    RE             LCT07170
0B1E 0 FFFF          DC    /FFFF    TERM           LCT07180
                     *                             LCT07190
0B1F 0 0004    MES16 DC    4        WDCT           LCT07200
0B20 0 2729          DC    /2729    PR             LCT07210
0B21 0 2637          DC    /2637    OG             LCT07220
0B22 0 0035          DC    /0035     E             LCT07230
0B23 0 2534          DC    /2534    ND             LCT07240
0B24 0 FFFF          DC    /FFFF    TERM           LCT07250
                     *                             LCT07260
0B25 0 000A    MES17 DC    10       WD CT          LCT07270
0B26 0 3529          DC    /3529    ER             LCT07280
0B27 0 2926          DC    /2926    RO             LCT07290
0B28 0 2900          DC    /2900    R              LCT07300
0B29 0 3925          DC    /3925    IN             LCT07310
0B2A 0 1300          DC    /1300    T              LCT07320
0B2B 0 1213          DC    /1213    ST             LCT07330
0B2C 0 2629          DC    /2629    OR             LCT07340
0B2D 0 3700          DC    /3700    G              LCT07350
0B2E 0 2729          DC    /2729    PR             LCT07360
0B2F 0 2613          DC    /2613    OT             LCT07370
0B30 0 FFFF          DC    /FFFF    TERM           LCT07380
                     *                             LCT07390
0B31 0 0008    MES18 DC    8        WD CT          LCT07400
0B32 0 3529          DC    /3529    ER             LCT07410
0B33 0 2926          DC    /2926    RO             LCT07420
0B34 0 2900          DC    /2900    R              LCT07430
0B35 0 3925          DC    /3925    IN             LCT07440
0B36 0 1300          DC    /1300    T              LCT07450
0B37 0 2731          DC    /2731    PA             LCT07460
0B38 0 2939          DC    /2939    RI             LCT07470
0B39 0 1318          DC    /1318    TY             LCT07480
0B3A 0 FFFF          DC    /FFFF    TERM           LCT07490
```


CORE STORAGE FUNCTION TEST
LOW CORE TEST

```
                     *                             LCT07500
0B3B 0 000C    MES19 DC    12       WD CT          LCT07510
0B3C 0 3529          DC    /3529    ER             LCT07520
0B3D 0 2926          DC    /2926    RO             LCT07530
0B3E 0 2900          DC    /2900    R              LCT07540
0B3F 0 3925          DC    /3925    IN             LCT07550
0B40 0 1300          DC    /1300    T              LCT07560
0B41 0 3925          DC    /3925    IN             LCT07570
0B42 0 1500          DC    /1500    V              LCT07580
0B43 0 2627          DC    /2627    OP             LCT07590
0B44 0 0033          DC    /0033     C             LCT07600
0B45 0 2634          DC    /2634    OD             LCT07610
0B46 0 3500          DC    /3500    E              LCT07620
0B47 0 FFFF          DC    /FFFF    TERM           LCT07630
                     *                             LCT07640
0B48 0 0002    MES20 DC    2        WD CT          LCT07650
0B49 0 3529          DC    /3529    ER             LCT07660
0B4A 0 0001          DC    /0001     1             LCT07670
0B4B 0 FFFF          DC    /FFFF    TERM           LCT07680
                     *                             LCT07690
0B4C 0 0002    MES21 DC    2        WD CT          LCT07700
0B4D 0 3529          DC    /3529    ER             LCT07710
0B4E 0 0002          DC    /0002     2             LCT07720
0B4F 0 FFFF          DC    /FFFF    TERM           LCT07730
                     *                             LCT07740
0B50 0 0002    MES22 DC    2        WD CT          LCT07750
0B51 0 3529          DC    /3529    ER             LCT07760
0B52 0 0003          DC    /0003     3             LCT07770
0B53 0 FFFF          DC    /FFFF    TERM           LCT07780
                     *                             LCT07790
0B54 0 0002    MES23 DC    2        WD CT          LCT07800
0B55 0 3529          DC    /3529    ER             LCT07810
0B56 0 0004          DC    /0004     4             LCT07820
0B57 0 FFFF          DC    /FFFF    TERM           LCT07830
                     *                             LCT07840
0B58 0 0002    MES24 DC    2        WD CT          LCT07850
0B59 0 3529          DC    /3529    ER             LCT07860
0B5A 0 0005          DC    /0005     5             LCT07870
0B5B 0 FFFF          DC    /FFFF    TERM           LCT07880
                     *                             LCT07890
0B5C 0 0002    MES25 DC    2        WD CT          LCT07900
0B5D 0 3529          DC    /3529    ER             LCT07910
0B5E 0 0006          DC    /0006     6             LCT07920
0B5F 0 FFFF          DC    /FFFF    TERM           LCT07930
                     *                             LCT07940
0B60 0 0000    RSEND DC    0                       LCT07950
0B61 0 0000          DC    0                       LCT07960
0B62 0 0000          DC    0                       LCT07970
0B64   0800          END   RSDKR                   LCT07980
```

CORE STORAGE FUNCTION TEST
LOW CORE TEST

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
CODCV	0AAF	0A88,0ADC
CODC1	0AB5	0AD1
CODC2	0AC7	0AC6
CODC3	0AD2	0ACC
CODC4	0AD6	0AAF,0AB0,0AB1
CODWD	0ADE	0A83,0A8A,0AB5,0AD5
CODOO	0AF0	0ABC,0A8D,0AC1,0AC2
CODO1	0AE1	0AC9,0AD2
CODO2	0AE2	0AD4
IDARA	0AA2	0A77,0A8C,0A95,0A97,0AAC
LHIND	0ADF	0AB3,0AB7,0ACB,0ACE
LOG	0A4B	09EF,0A03,0A0A,0A53,0A69,0A68,0A7E
LOG01	0A4C	
LOG02	0A56	0A5E,0A60
LOG03	0A5D	0A57
LOG04	0A5F	0A5A
LOG05	0A61	0A5C
LOG06	0A67	0A4C,0A86
MES15	0813	
MES16	081F	
MES17	0825	09F1
MES18	0831	0A05
MES19	083B	0A0C
MES20	0848	
MES21	084C	
MES22	0850	
MES23	0854	
MES24	0858	
MES25	085C	
NEXT	09D8	09D6
PRSN	0AA6	0A62
PRSNS	0AA4	0A56,0A66
PRWRT	0AA8	0A55,0A61
RSAAB	0813	080F
RSAAC	0818	0813
RSAAD	0819	0811
RSAAE	081A	0806,0808
RSAAH	081B	0847,0869,08C2,0904,0933,0983,0983
RSAAK	081C	0814,0830,094C
RSAAL	081F	082D
RSAAM	0822	0800,0803
RSABA	082D	0817
RSABB	0841	086F
RSABC	0843	0848
RSABD	084C	0848
RSABE	084E	085C,0866,C86D
RSABF	0861	0852
RSABG	086E	086A
RSABH	0840	0876,09CF
RSABI	083E	0831,09CA
RSABJ	0892	0883
RSABK	0883	08A4
RSABL	089C	08AE,08B9
RSABM	09C1	088D
RSABN	087B	0890,0898,08C8
RSABO	08C9	08C4
RSABP	0879	09CA
RSABQ	089D	08C0
RSABR	0878	08D1
RSACA	0901	08FC
RSACB	09F7	09CA
RSACD	0903	0900
RSACE	0916	0912
RSACF	0926	0915,0917
RSACG	0910	092A

CORE STORAGE FUNCTION TEST
LOW CORE TEST

RSACH	090E	0921,0930
RSACJ	08DC	08D3,093E
RSACK	09E2	0935
RSACL	090D	0938
RSACM	0977	0968
RSACN	095B	0972,097C,0985
RSACO	095F	0956,C982
RSACP	09A7	0998
RSACQ	098F	09A2,09AC,0985
RSACR	0990	098E,0982
RSACS	0953	0988
RSACU	0952	094E,09BF
RSACV	094C	0940
RSACW	0939	08E5
RSACX	08E6	08E4
RSADA	09C1	0950
RSADB	0908	0906
RSCCA	09D1	0827,09F5,0A12,0A18,0A1D
RSCCB	09F7	09E2,09F2
RSCCC	0A06	0A01
RSCCD	0A0D	09ED,09FD,0A08
RSCCE	0A1B	09D3
RSCCG	09F3	09E5
RSCCH	0A1C	0A17
RSCCQ	09CF	09C3
RSDDD	0A32	085E,0885,0880,0923,0974,09A4,0A34,0A37,0A39,0A40, 0A46
RSDDJ	0A44	0A33
RSDDK	0A48	09DE
RSDDX	0A34	
RSDKR	0800	0863
RSDKS	0803	0822,09CD,0A49
RSEND	0860	095F,0990
RSEXI	09CC	
RSFAA	081D	083E
RSFAB	081E	083F,09C1
RSQAC	0826	0841,084C,0879,08F4,0908,0953,0988
RSQAD	0827	0835
RSQAE	0828	0843,0844,0845,084E,084F,0851,0868
RSQAF	0824	0856,0861,C870,088A,0892,08A8,08B3,08C8,091B,0928, 0939,096C,0977,099C,09A7,09B9,09C4,09D8,09E7,09F7, 0A0D,0A3A,0A4D
RSQAH	08D6	0878,087C,087F,0881,089D,08A1,08C1,08C6,08E6,08E7, 08EA,08E8,08ED,08EE,08F1,08F2
RSQAI	08D7	087E
RSQAJ	08D8	089A
RSQAK	08D9	089B,089C,089F,08A3,08BB,089F
RSQAL	082A	0824,0858,C862,0872,088C,C894,08AA,0885,08CD,091D, 092D,0938,096E,0979,099E,09A9,09B8,09C6,09DA,09E9, 09F9,0A0F,0A3C,0A4F
RSQAM	08DA	08C7,097F,09AF
RSQAN	08DB	0854,0888,08A6,0919,096A,099A,0A42
RSQAO	0825	0834
RSQAP	0829	0833
RSQAQ	08D4	08E0
RSQAR	08D5	08E1,08E2
RSQAU	082B	0838
RSQAV	082C	083B
RSRAA	0941	08F6,08F7,08FE,0901,0903,0908,090D,0910,0926,0932
RSRAB	0942	08F9,08FB
RSRAC	0943	08E8,08EF,0914,0916,095B,0967
RSRAE	0944	0955,095C,0960,0963,0965,097E,0981,098D,0991,0994, 0996,09AE,09B1
RSRAF	0945	0962,0993
RSRAG	0946	0874,08CF,093D,098D
RSRAH	0947	09C8
RSRAI	0948	085A,0864,088E,0896,08AC,08B7,091F,092F,0970,097B, 09A0,09AB

CORE STORAGE FUNCTION TEST
LOW CORE TEST

RSRAJ	094A	090E
RSRAK	094B	090F,0928
RSRAX	0949	09EB,09FB
RSSAA	0A1F	09D2,0A1A
RSSAC	0A22	09D4
RSSAD	0A24	09D5,09E0,09F3,09FF,0A06,0A14
RSSAE	0A28	09E1,09F4
RSSAF	0A25	0959,0989,09E4
RSSAG	0A26	0987
RSSAH	0A27	0957
RSSAI	0A29	0A00
RSSAJ	0A2A	0A07
RSSAK	0A2B	0A11,0A3E
RSSAL	0A2C	0A35
RSSAM	0A2D	0A38
RSSAN	0A2E	0A16
RSSAO	0A2F	09DC
RSSAP	0A30	09DD
RSSAQ	0A31	0A48
TWRTR	0A6D	0A51,0A75
TWRTO	0A9F	0A76
TWRT1	0AA0	0A85
TWRO1	0A76	0A72
TWRO2	0A81	0A80,0A9E
TWRO3	0A9B	0A94
TWSNS	0AAA	0839,0A6F,0A79,0A8E
TWWRT	0AAC	083C,0A78,0A8D
WRDSW	0AA1	0A6E,0A92,0A98,0A9C
XIOSN	0A8E	0A91
XIOWR	0A8D	0A9A
ZONE	0AE3	0AC4
ZONEN	0AE7	0AE3
ZONE1	0AF2	0AE4
ZONE2	0AFD	0AE5
ZONE3	0B07	0AE6

METER TEST

TABLE OF CONTENTS

METER TEST

1. PURPOSE

A. TO CHECK THE ACCURACY OF ALL OF THE USE METERS.
B. WHEN THE 1131 USE METER IS SWITCHED TO C.E MODE, ONLY THE C.E. METER ADVANCES.

2. PREREQUISITES

2.1 PROGRAM

THIS PROGRAM DOES NOT RUN UNDER CONTROL OF THE 1130 DIAGNOSTIC MONITOR. IT IS SELF LOADING. (USES THE BASIC DIAGNOSTIC LOADER)

2.2 EQUIPMENT

CUSTOMER ENGINEER USE METER KEY.

3. USE PROCEDURE

THE OPERATING PROCEDURE CONSISTS OF THE FOLLOWING STEPS.

1. RECORD ALL METER READINGS
2. LOAD THE PROGRAM
3. ENTER SYSTEM I/O CONFIGURATION IN THE CONSOLE ENTRY SWITCHES.(WAIT1)
4. SET THE NUMBER OF 72 SECOND LOOPS DESIRED. (WAIT2)
5. CHECK METERS WHILE IN C.E. MODE. (THIS SECTION IS OPTIONAL)
6. CHECK THE CUSTOMER METERS
7. COMPUTE THE ELAPSED TIME.(BY HAND)
8. CHECK THE METER CONTROL CIRCUITS.

3.1 LOADING

1. RECORD THE READINGS ON ALL OF THE CUSTOMER METERS. THE CUSTOMER M MUST BE GIVEN CREDIT FOR THIS TEST TIME.
2. PUT THE 1131 METER IN C.E.MODE.
3. PLACE CARDS/PAPER TAPE IN READER.
4. PUT READER IN READY CONDITION
5. PRESS THE 1131 RESET KEY
6. PRESS THE 1131 PROGRAM LOAD KEY.

NOTE
IF THE PROGRAM LOADED CORRECTLY, IT WILL STOP AT WAIT 1. (LOC 0208)

3.2 OPERATION

THE SYSTEM I/O CONFIGURATION MUST NOW BE SET IN THE CONSOLE ENTRY SWITCHES. USE THE FOLLOWING FORMAT.

BIT 13 ON = SYSTEM HAS 1132
BIT 14 ON = SYSTEM HAS 1442
BIT 15 ON = SYSTEM HAS DISK STORAGE.

FOR EXAMPLE, IF A SYSTEM HAS ALL THREE OF THE I/O DEVICES, ALL THREE BIT SWITCHES WOULD BE TURNED ON.
PRESS 1131 START BUTTON. PROGRAM WILL GO TO WAIT 2. (LOC 0216)

3.2.2 MAKE THE I/O UNITS READY.

1442- PLACE A FEW CARDS IN THE FEED HOPPER AND PRESS THE 1442 START KEY. THE 1442 READY LAMP SHOULD GLOW.

1132 - TURN ON THE POWER SWITCH, AND PRESS THE 1132 START KEY. THE 1132 READY LAMP SHOULD GLOW.

3.2.3 TO CHECK C.E. MODE (THIS SECTION IS OPTIONAL)

1. SET THE CONSOLE ENTRY SWITCHES TO INDICATE THE NUMBER OF 72 SECOND LOOPS THAT YOU WISH TO MAKE. IF ONE LOOP IS DESIRED, TURN ON BIT 15. IF TWO LOOPS ARE DESIRED, TURN ON BIT 14. ETC.
2. RECORD ALL METER READINGS.
3. PRESS 1131 START KEY.

NOTE

IF THE PROGRAM STOPS AT.
WAIT 3 (LOC.0225) THE 1442 IS NOT READY.
WAIT 4 (LOC.022A) THE 1132 IS NOT READY.
WAIT 6 (LOC.0237) THE DISK IS NOT READY.

4. PROGRAM WILL STOP AT WAIT 5 (LOC.0245) WHEN THE DESIRED DELAY IS COMPLETED. METER ACCURACY SHOULD BE PLUS OR MINUS XX.
5. C.E. METER SHOULD HAVE ADVANCED .02 HOURS FOR EACH LOOP RUN. THE CUSTOMER METERS SHOULD NOT HAVE MOVED.
6. TO REPEAT LOOP, PRESS START KEY.
7. SWITCH 1131 METER OFF OF CE MODE.

3.2.4 TO CHECK CUSTOMER METERS

1. SET THE CONSOLE ENTRY SWITCHES TO INDICATE THE NUMBER OF 72 SECOND LOOPS THAT YOU WISH TO MAKE. IF ONE LOOP IS DESIRED, TURN ON BIT 15. IF TWO LOOPS ARE DESIRED, TURN ON BIT 14. ETC.
2. RECORD ALL METER READINGS.
3. PRESS 1131 START KEY.

NOTE

IF THE PROGRAM STOPS AT.
WAIT 3 (LOC.0225) THE 1442 IS NOT READY.
WAIT 4 (LOC.022A) THE 1132 IS NOT READY.
WAIT 6 (LOC.0237) THE DISK IS NOT READY.

4. PROGRAM WILL STOP AT WAIT 5 (LOC.0245) WHEN THE DESIRED DELAY IS COMPLETED. METER ACCURACY SHOULD BE PLUS OR MINUS XX.
5. THE CUSTOMER METERS SHOULD HAVE ADVANCED .02 HOURS FOR EACH LOOP RUN. THE C.E. METER SHOULD NOT HAVE MOVED.
6. TO REPEAT LOOP, PRESS START KEY.

3.2.5 CONTROL CIRCUITRY CHECK

1. WHILE RUNNING THE PROGRAM IN A 72 SECOND DELAY LOOP.

   A. THE 1132 METER SHOULD STOP IF THE 1132 CARRIAGE RESTORE OR CARRIAGE SPACE KEY IS PRESSED.

   B. THE 1442 METER SHOULD STOP IF THE 1442 NPRD KEY IS PRESSED.

2. CHECK THAT NO METERS ARE MOVING WHILE PROGRAM IS AT WAIT 5.
3. WHENEVER THE 1131 METER IS TURNED ON, THERE IS A DELAY CIRCUIT THAT KEEPS THE METER RUNNING FOR A MINIMUM OF 400 MILLISECONDS. TO CHECK THIS CIRCUIT, SET THE 1131 MODE SWITCH TO SINGLE INSTRUCTION(SI). WHEN THE 1131 START KEY IS PRESSED, THE RUN LAMP SHOULD GLOW FOR AN INSTANT (400M.S.) IF TROUBLE IS SUSPECTED AN OSCILLOSCOPE SHOULD BE USED.

3.3 WAITS

WAIT 1 (LOC 020B) SET THE I/O CONFIGURATION IN THE CONSOLE ENTRY SWITCHES.PRESS THE 1131 START BUTTON.

WAIT 2 (LOC 0216) SET THE CONSOLE ENTRY SWITCHES TO INDICATE THE NUMBER OF 72 SECOND (.02 HOURS) LOOPS DESIRED. PRESS 1131 START BUTTON TO BEGIN TEST.

WAIT 3 (LOC.0225) THE 1442 IS NOT READY. TO RESTART, PUT 1442 IN READY STATUS, AND START THE PROGRAM AT 'SENSE' (LOC 0217) (CONSOLE ENTRY SWITCHES SHOULD STILL HAVE NUMBER OF LOOPS DESIRED)

WAIT 4 (LOC022A) THE 1132 IS NOT READY. TO RESTART, PUT 1132 IN READY STATUS, AND START THE PROGRAM AT 'SENSE' (LOC.0217). (CONSOLE ENTRY SWITCHES SHOULD STILL HAVE THE NUMBER OF LOOPS DESIRED.)

WAIT 5 (LOC 0245) END OF TEST. PRESS 1131 START BUTTON TO REPEAT TEST.

WAIT 6 (LOC 0237) THE DISK IS NOT READY. TO RESTART, PUT THE DISK IN 'READY' STATUS, AND START THE PROGRAM AT 'SENSE' (LOC.0217) (CONSOLE ENTRY SWITCHES SHOULD STILL HAVE THE NUMBER OF LOOPS DESIRED.)

3.4 TERMINATIONS

THE PROGRAM WILL STOP AT WAIT 5 (LOC.0245)WHEN THE TEST IS COMPLETED. TO REPEAT TEST, PRESS 1131 START BUTTON.

4. PRINTOUTS (NONE)

5. COMMENTS

THE TESTING METHOD IS ACCOMPLISHED ONE OF TWO WAYS.

1. IF THE SYSTEM IS EQUIPPED WITH DISK STORAGE, 7.2 SECONDS OF EACH 72 SECOND DELAY LOOP WILL BE USED TO ACCESS THE DISK CARRAIGE. THIS CHECKS THE CIRCUITRY TO THE 'USE METER' FROM THE 'SEEK' CIRCUITS. THE REMAINING 64.8 SECOND DELAY IS ACCOMPLISHED BY ADDITION IN THE ACCUMULATOR. 7.2 SECONDS = ONE DIVISION ON THE 'USE METER'.

2. IF THE SYSTEM IS NOT EQUIPPED WITH DISK STORAGE, THE ENTIRE 72 SECOND DELAY IS ACCOMPLISHED IN THE ACCUMULATOR.

METER TEST

```
                        ABS                                          UMT00000
028C                    ORG     500                                  UMT00010
                    *                                                UMT00020
                    ************************************************ UMT00030
                    * INTERRUPT TRANSFER VECTORS                   * UMT00040
                    ************************************************ UMT00050
01F4 00 6500025E    BEGIN LDX   L1 INT1                              UMT00060
01F6 00 6D000009          STX   L1 /0009                             UMT00070
01F8 00 65000263          LDX   L1 INT2                              UMT00080
01FA 00 6D00000A          STX   L1 /000A                             UMT00090
01FC 00 65000268          LDX   L1 INT4                              UMT00100
01FE 00 6D00000C          STX   L1 /000C                             UMT00110
                    *                                                UMT00120
                    ************************************************ UMT00130
                    * CLEAR 1132 SCAN FIELD                        * UMT00140
                    ************************************************ UMT00150
0200 0  6220              LDX   2 32                                 UMT00160
0201 0  6107              LDX   1 7                                  UMT00170
0202 00 C4000270          LD    L DSWR1       SET ACC TO 0           UMT00180
0204 0  D200        CLEAR STO   2             SET PRINT AREA TO 0    UMT00190
0205 0  7201              MDX   2 1                                  UMT00200
0206 0  71FF              MDX   1 -1                                 UMT00210
0207 0  70FC              MDX   CLEAR                                UMT00220
0208 00 C400026E          LD    L HOME                               UMT00230
020A 0  D200              STO   2             SET LOC 39 TO 0001     UMT00240
                    ************************************************ UMT00250
                    * READ THE CONSOLE ENTRY SWITCHES TO           * UMT00260
                    * DETERMINE THE SYSTEM CONFIGURATION           * UMT00270
                    *             BIT 15= DISK                     * UMT00280
                    *             BIT 14= 1442                     * UMT00290
                    *             BIT 13= 1132                     * UMT00300
                    ************************************************ UMT00310
020B 0  3001        WAIT1 WAIT  1             ENTER SYS CONF.        UMT00320
020C 0  0865              XIO   CESWS                                UMT00330
020D 0  C078              LD    COUNT                                UMT00340
020E 0  D07A              STO   DISK1                                UMT00350
020F 0  1801              SRA   1                                    UMT00360
0210 0  D076              STO   SRP1                                 UMT00370
0211 0  1801              SRA   1                                    UMT00380
0212 0  D075              STO   PRTR2                                UMT00390
0213 0  C075              LD    DISK1                                UMT00400
0214 0  4804              BSC   E                                    UMT00410
0215 0  7017              MDX   DISK                                 UMT00420
                    *                                                UMT00430
                    ************************************************ UMT00440
                    * READ THE CONSOLE ENTRY SWITCHES              * UMT00450
                    * START THE 1132 AND THE 1442 METERS           * UMT00460
                    ************************************************ UMT00470
0216 0  3002        WAIT2 WAIT  2             ENTER NO OF DLY LOOPS  UMT00480
0217 0  085A        SENSE XIO   CESWS         SENSE CON ENTRY SWS    UMT00490
0218 00 67800286          LDX   I3 COUNT      XR3= LOOP COUNT        UMT00500
021A 0  C06C              LD    SRP1                                 UMT00510
021B 0  4804              BSC   E                                    UMT00520
021C 0  7007              MDX   SRP2          START 1442             UMT00530
021D 0  C06A        SNS1  LD    PRTR2                                UMT00540
021E 0  4804              BSC   E                                    UMT00550
021F 0  7009              MDX   PRTR3         START 1132             UMT00560
0220 0  C068        SNS2  LD    DISK1                                UMT00570
0221 0  4804              BSC   E                                    UMT00580
0222 0  7025              MDX   TESTO                                UMT00590
0223 0  7018              MDX   ADD1                                 UMT00600
0224 0  084F        SRP2  XIO   SRP           START 1442.            UMT00610
0225 0  3003        WAIT3 WAIT  3             NO RESP. FROM 1442     UMT00620
0226 0  4804              BSC   E             IS 1442 READY          UMT00630
0227 0  70FD              MDX   WAIT3                                UMT00640
0228 0  70F4              MDX   SNS1                                 UMT00650
0229 0  084C        PRTR3 XIO   PRTR          START 1132.            UMT00660
022A 0  3004        WAIT4 WAIT  4             NO RESP. FROM 1132     UMT00670
```


METER TEST

```
022B 0  084C              XIO   PRTR1       STOP THE 1132 INTR     UMT00680
022C 0  70F3              MDX   SNS2                                UMT00690
                    *                                              UMT00700
                    ************************************************ UMT00710
                    * SET DISK TO HOME                             * UMT00720
                    ************************************************ UMT00730
022D 00 0C000270    DISK  XIO   L DSWR1       IS DISK RDY            UMT00740
022F 0  1002              SLA   2                                    UMT00750
0230 00 4C280237          BSC   L WAIT6,+Z    IF NOT RDY GO TO WT6   UMT00760
0232 0  1002              SLA   2                                    UMT00770
0233 00 4C280216          BSC   L WAIT2,+Z    IS CARR HOME           UMT00780
0235 00 0C00026E    SEEK  XIO   L HOME        SEEK -1 CYL            UMT00790
0237 0  3006        WAIT6 WAIT  6             DISK NOT READY         UMT00800
0238 0  1004              SLA   4                                    UMT00810
0239 0  4810              BSC   -             IS CARR HOME           UMT00820
023A 0  70FA              MDX   SEEK                                 UMT00830
023B 0  70DA              MDX   WAIT2                                UMT00840
                    ************************************************ UMT00850
                    * METER TEST                                    UMT00860
                    * 72 SECOND DELAY USING ONLY THE CPU            UMT00870
                    ************************************************ UMT00880
023C 0  6148        ADD1  LDX   1 72          CONSTANT               UMT00890
023D 0  C04C        ADD2  LD    NUM                                  UMT00900
023E 0  802F        ADD3  A     HOME          ADD 1 TO ACCUM         UMT00910
023F 0  4820              BSC   Z                                    UMT00920
0240 0  70FD              MDX   ADD3                                 UMT00930
0241 0  71FF              MDX   1 -1          MODIFY CONSTANT        UMT00940
0242 0  70FA              MDX   ADD2                                 UMT00950
0243 0  73FF              MDX   3 -1          MODIFY LOOP COUNT      UMT00960
0244 0  70F7              MDX   ADD1                                 UMT00970
0245 0  3005        WAIT5 WAIT  5             END OF TEST            UMT00980
0246 00 4C000217          BSC   L SENSE                              UMT00990
                    *                                              UMT01000
                    ************************************************ UMT01010
                    * METER TEST                                    UMT01020
                    * 72 SECOND DELAY USING THE DISK AND THE CPU*   UMT01030
                    ************************************************ UMT01040
0248 0  0831        TEST0 XIO   DLY1          SEEK+202 CYL           UMT01050
0249 0  3C00              WAIT                                       UMT01060
024A 0  0831              XIO   DLY2          SEEK-202 CYL           UMT01070
0248 0  3000              WAIT                                       UMT01080
024C 0  082D              XIO   DLY1          SEEK+202 CYL           UMT01090
024D 0  3000              WAIT                                       UMT01100
024E 0  082D              XIO   DLY2          SEEK-202 CYL           UMT01110
024F 0  3000              WAIT                                       UMT01120
0250 0  082D              XIO   DLY3          SEEK+76 CYL            UMT01130
0251 0  3000              WAIT                                       UMT01140
0252 0  082D              XIO   DLY4          SEEK-76 CYL            UMT01150
0253 0  3000              WAIT                                       UMT01160
0254 0  C01B              LD    DSWR1         CLEAR ACCUM            UMT01170
0255 0  613C              LDX   1 60          CONSTANT               UMT01180
0256 0  8017        ADD   A     HOME          ADD 1 TO ACCUM         UMT01190
0257 0  4820              BSC   Z                                    UMT01200
0258 0  70FD              MDX   ADD                                  UMT01210
0259 0  71FF              MDX   1 -1          MODIFY CONSTANT        UMT01220
025A 0  70FB              MDX   ADD                                  UMT01230
025B 0  73FF              MDX   3 -1          MODIFY LOOP COUNT      UMT01240
025C 0  70EB              MDX   TESTO                                UMT01250
025D 0  70E7              MDX   WAIT5                                UMT01260
                    *                                              UMT01270
                    ************************************************ UMT01280
                    * INTERRUPT SUBROUTINES                        * UMT01290
                    ************************************************ UMT01300
025E    0001        INT1  BSS   1             1132                   UMT01310
025F 00 0C000284          XIO   L DSWR3       SENSE DSW              UMT01320
0261 00 4CC0025E          BOSC  I INT1                               UMT01330
0263    0001        INT2  BSS   1             DISK                   UMT01340
0264 00 0C000270          XIO   L DSWR1       SENSE DSW              UMT01350
```

```
0266 00 4CC00263          BOSC I  INT2                                  UMT01360
0268    0001      INT4    BSS     1           1442                      UMT01370
0269 00 0C000282          XIO   L DSWR2       SENSE DSW                 UMT01380
026B 00 4CC00268          BOSC I  INT4                                  UMT01390
                          *                                             UMT01400
                          ********************************************  UMT01410
                          * I/O CONTROL COMMANDS AND CONSTANTS       *  UMT01420
                          ********************************************  UMT01430
026E    0000              BSS   E 0                                     UMT01440
026E 0  0C01      HOME    DC      /0001       IOCC TO SEEK HOME         UMT01450
026F 0  2404              DC      /2404                                 UMT01460
0270 0  0000      DSWR1   DC      /0000       IOCC TO SENSE AND         UMT01470
0271 0  2701              DC      /2701       RESET DISK                UMT01480
0272 0  0286      CESWS   DC      COUNT       IOCC TO RD CE SWS         UMT01490
0273 0  3A00              DC      /3A00                                 UMT01500
0274 0  0000      SRP     DC      /0000       IOCC TO START 1442        UMT01510
0275 0  1402              DC      /1402       METER                     UMT01520
0276 0  0000      PRTR    DC      /0000       IOCC TO START 1132        UMT01530
0277 0  3480              DC      /3480       METER                     UMT01540
0278 0  0000      PRTR1   DC      /0000       IOCC TO STOP 1132         UMT01550
0279 0  3440              DC      /3440       EMIT INTERRUPTS           UMT01560
027A 0  00CA      DLY1    DC      /00CA       IOCC SEEK TO 202          UMT01570
027B 0  2400              DC      /2400       FROM HOME                 UMT01580
027C 0  00CA      DLY2    DC      /00CA       IOCC SEEK TO HOME         UMT01590
027D 0  2404              DC      /2404       FROM 202                  UMT01600
027E 0  004C      DLY3    DC      /004C       IOCC SEEK TO 076          UMT01610
027F 0  2400              DC      /2400       FROM HOME                 UMT01620
0280 0  004C      DLY4    DC      /004C       IOCC SEEK TO HOME         UMT01630
0281 0  2404              DC      /2404       FROM 076                  UMT01640
0282 0  0000      DSWR2   DC      /0000       IOCC TO SENSE AND         UMT01650
0283 0  1702              DC      /1702       RESET 1442 DSW            UMT01660
0284 0  0000      DSWR3   DC      /0000       IOCC TO SENSE AND         UMT01670
0285 0  3701              DC      /3701       RESET 1132 DSW            UMT01680
0286 0  0000      COUNT   DC      /0000       CON ENTRY SW SETTING      UMT01690
0287 0  0000      SRP1    DC      0000        SYSTEM HAS 1442           UMT01700
0288 0  0000      PRTR2   DC      0000        SYSTEM HAS 1132           UMT01710
0289 0  0000      DISK1   DC      0000        SYSTEM HAS DISK           UMT01720
028A 0  1340      NUM     DC      /1340                                 UMT01730
028C    01F4              END     BEGIN                                 UMT01740
```


CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
ADD	0256	0258,025A
ADD1	023C	0223,0244
ADD2	023D	0242
ADD3	023E	0240
BEGIN	01F4	028B
CESWS	0272	020C,0217
CLEAR	0204	0207
COUNT	0286	020D,0218,0272
DISK	022D	0215
DISK1	0289	020E,0213,0220
DLY1	027A	0248,024C
DLY2	027C	024A,024E
DLY3	027E	0250
DLY4	0280	0252
DSWR1	0270	0202,022D,0254,0264
DSWR2	0282	0269
DSWR3	0284	025F
HOME	026E	0208,0235,023E,0256
INT1	025E	01F4,0261
INT2	0263	01F8,0266
INT4	0268	01FC,026B
NUM	028A	023D
PRTR	0276	0229
PRTR1	0278	022B
PRTR2	0288	0212,021D
PRTR3	0229	021F
SEEK	0235	023A
SENSE	0217	0246
SNS1	021D	0228
SNS2	0220	022C
SRP	0274	0224
SRP1	0287	0210,021A
SRP2	0224	021C
TEST0	0248	0222,025C
WAIT1	020B	
WAIT2	0216	0233,023B
WAIT3	0225	0227
WAIT4	022A	
WAIT5	0245	025D
WAIT6	0237	0230

CORE STORAGE ADJUSTMENT TEST

CORE ADJUSTMENT TEST

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CORE STORAGE ADJUSTMENT TEST

1. PURPOSE

THE CORE ADJUSTMENT PROGRAM LOADS CORE WITH THE BEST CORE PATTERN (BCP) SPECIFIED IN THE ENGINEERING SPECIFICATIONS FOR SJ-2 STORAGE. THIS ALLOWS ADJUSTMENT OF THE CORE VOLTAGES AS SPECIFIED IN THE 1130 MAINTENANCE MANUAL.

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES

THE CORE ADJUSTMENT PROGRAM IS LOADED BY THE 1130 BASIC DIAGNOSTIC LOADER.

2.2 EQUIPMENT PREREQUISITES

a. 1131 CPU.
b. 1442 OR 1054 READER.

3 USE PROCEDURE

3.1 PROGRAM LOADING

1. PLACE CARDS/PAPER TAPE IN READER.
2. MAKE READER READY.
3. PRESS THE 1131 RESET KEY.
4. PRESS THE 1131 PROGRAM LOAD KEY.
5. IF PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW LOCATION 012C, REFER TO BASIC LOADER DOCUMENTATION SECT. 3.2.

3.2 OPERATING PROCEDURE

1. PROGRAM WILL LOAD, RUN BRIEFLY, THEN STOP AT END-OF-PROGRAM WAIT 30FF AT LOCATION 0149.
2. REFER TO 1130 MAINTENANCE MANUAL SECT. 4 FOR CORE ADJUSTMENT PROCEDURES.
3. PROGRAM MAY BE RERUN BY PRESSING PROGRAM START WHILE AT END-OF-PROGRAM WAIT.

4. PRINT OUTS (NONE)

5. COMMENTS

THE CORE ADJUSTMENT PROGRAM LOADS THE BEST CORE PATTERN IN ALL LOCATIONS ABOVE 017C.

THE SIZE OF CORE IS AUTOMATICALLY DETERMINED BY THE PROGRAM.

THE CORE ADJUSTMENT PROGRAM SHOULD NOT BE EXECUTING WHILE THE CORE UNIT IS BEING ADJUSTED.

CORE ADJUSTMENT TEST

```
                        ABS
02BC                    ORG     300
                *
012C 0  1010    START   SLA     16          FIND CORE SIZE
012D 00 D4000000        STO  L  0
012F 0  C00A            LD      KON
0130 0  D00A            STO     SIZE
0131 00 D4800138    AA  STO  I  SIZE
0133 00 74000000        MDX  L  0,0
0135 0  7006            MDX     CONT
0136 0  1001            SLA     1
0137 00 D4000138        STO  L  SIZE
0139 0  70F7            MDX     AA
013A 0  1000    KON     DC      /1000
013B 0  0000    SIZE    DC      0
013C 0  C0FE    CONT    LD      SIZE
013D 00 4C28014B        BSC  L  NEGN,+Z
013F 0  903C            S       LAST
0140 0  D001            STO     SETX+1
0141 00 66000000    SETX LDX    L2 0        SET X2 = NO. LOCS TO
0143 00 6500017D    LDX1 LDX    L1 FIRST    * PLACE DATA
0145 00 4400014E    REPT BSI    L  PLACE    SET A PATTERN
0147 0  72FF            MDX     2 -1        CK FOR DONE ALL CORE
0148 0  70FC            MDX     REPT        NO
0149 0  30FF            WAIT    -1          DONE ALL CORE, END PROG
014A 0  70E1            MDX     START
                *
014B 00 66007E82    NEGN LDX    L2 /7FFF-FIRST
014D 0  70F5            MDX     LDX1
                *
014E 0  0000    PLACE   DC      0           PLACE PATTERN SUBRT
014F 0  6925            STX     1 TLOC
0150 0  C024            LD      TLOC        GET TEST LOC ADDR
0151 0  1003            SLA     3
0152 0  4828            BSC     +Z          SKIP IF X3 = 0
0153 0  701B            MDX     FX3
0154 0  C020            LD      TLOC
0155 0  E020            AND     CON1        CON1 = /0F00
0156 0  F020            EOR     CON2        CON2 = /0100
0157 00 4C18016D        BSC  L  LD1S,+-     BRNH IF X4X5X6X7 = 0001
0159 0  C01B            LD      TLOC
015A 0  E01D            AND     CON3        CON3 = /0F80
015B 0  F01D            EOR     CON4        CON4 = /0780
015C 00 4C18016D        BSC  L  LD1S,+-     BRNH IF X4X5X6X7X8 =01111
015E 0  1810    LDZS    SRA     16
015F 00 D4800175        STO  I  TLOC
0161 0  C013            LD      TLOC
0162 0  E017            AND     CON5        CON5 = /0040
0163 0  4818            BSC     +-          SKIP IF Y9 = 1
0164 0  7005            MDX     DONE
0165 00 C4800175        LD   I  TLOC
0167 0  F013            EOR     CON6        CON6 = /FFFF
0168 00 D4800175        STO  I  TLOC
016A 0  7101    DONE    MDX     1 1
016B 00 4C80014E        BSC  I  PLACE       EXIT FROM SUBRT
016D 0  C00D    LD1S    LD      CON6        CON6 = /FFFF
016E 0  70F0            MDX     LDZS+1
016F 0  C005    FX3     LD      TLOC
0170 0  E005            AND     CON1        CON1 = /0F00
0171 0  F004            EOR     CON1        CON1 = /0F00
0172 00 4C18015E        BSC  L  LDZS,+-     BR IF X4X5X6X7 = 1111
0174 0  70F8            MDX     LD1S
0175 0  0000    TLOC    DC      0
0176 0  0F00    CON1    DC      /0F00
0177 0  0100    CON2    DC      /0100
0178 0  0F80    CON3    DC      /0F80
0179 0  0780    CON4    DC      /0780
017A 0  0040    CON5    DC      /0040
```


CORE ADJUSTMENT TEST

```
017B 0  FFFF    CON6    DC      /FFFF
017C 0  017D    LAST    DC      FIRST
017D 0  0000    FIRST   DC      0           FIRST LOC OF PATTERN
017E    012C            END     START
```

CORE ADJUSTMENT TEST

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
AA	0131	0139
CONT	013C	0135
CON1	0176	0155,0170,0171
CON2	0177	0156
CON3	0178	015A
CON4	0179	015B
CON5	017A	0162
CON6	017B	0167,016D
DONE	016A	0164
FIRST	017D	0143,014B,017C
FX3	016F	0153
KON	013A	012F
LAST	017C	013F
LDX1	0143	014D
LDZS	015E	016E,0172
LD1S	016D	0157,015C,0174
NEGN	014B	013D
PLACE	014E	0145,016B
REPT	0145	0148
SETX	0141	0140
SIZE	013B	0130,0131,0137,013C
START	012C	014A,017E
TLOC	0175	014F,0150,0154,0159,015F,0161,0165,0168,016F

CORE ADJUSTMENT TEST

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
AA	0131	0139
CONT	013C	0135
CON1	0176	0155,0170,0171
CON2	0177	0156
CON3	0178	015A
CON4	0179	015B
CON5	017A	0162
CON6	017B	0167,016D
DONE	016A	0164
FIRST	017D	0143,017C
FX3	016F	0153
KON	013A	012F
LAST	017C	013F,014B
LDX1	0143	014D
LDZS	015E	016E,0172
LD1S	016D	0157,015C,0174
NEGN	014B	013D
PLACE	014E	0145,016B
REPT	0145	0148
SETX	0141	0140
SIZE	013B	0130,0131,0137,013C
START	012C	014A,017E
TLOC	0175	014F,0150,0154,0159,015F,0161,0165,0168,016F

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1. PURPOSE

THE 1130 INTERRUPT TEST PROGRAM IS DESIGNED TO ISOLATE INTERRUPT FAILURES WHICH COULD PREVENT THE LOADING OF OTHER PROGRAMS WITH THE BASIC DIAGNOSTIC LOADER IN THE 'LOAD AND GO MODE.' THE PROGRAM EXECUTES 2 BASIC TESTS OR AN AUTOMATIC LEVEL RESET LOOP FOR SCOPING THE CAUSE OF A LEVEL NOT BEING RESET. TEST 1 IS RUN ON ALL DEVICES AND CHECKS THE BASIC OPERATION OF THE INTERRUPT FORCED BRANCH, THE PROPER EXECUTION OF A LEVEL 4 INTERRUPT, AND ISOLATES INTERRUPT LEVELS WHICH ARE NOT BEING RESET.

TEST 2 IS RUN ON THE 1442 READER AND CHECKS THE PROPER EXECUTION OF A LEVEL 4 INTERRUPT IN CONJUNCTION WITH A LEVEL 0 INTERRUPT, THE ARRIVAL OF AN END OP EITHER TOO SOON OR TOO LATE IN CONJUNCTION WITH THE COLUMN INTERRUPT, AND PROPER EXECUTION OF A LEVEL 0 INTERRUPT.
BOTH TESTS PROVIDE ERROR WAITS, ERROR LOOPS, AND SCOPE LOOP ROUTINES TO HELP DIAGNOSE THE FAILURE AND AID IN A QUICK REPAIR.

THE AUTOMATIC LEVEL RESET LOOP MODE IS FOR SCOPING THE RESET PROBLEM AND A WAIT INDICATE THE RESETTING OF THE INTERRUPT, IF IT OCCURS.

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES

1130 BASIC DIAGNOSTIC LOADER.

2.2 EQUIPMENT PREREQUISITES

CARD READER OR PAPER TAPE READER.

3. OPERATING PROCEDURES

3.1 PROGRAM LOADING

1. THE 1130 INTERRUPT TEST IS LOADED BY THE 1130 BASIC DIAGNOSTIC LOADER.
2. SET THE C. E. INTERRUPT DELAY SWITCH TO THE 'ON' POSITION.
3. SEE BASIC DIAGNOSTIC LOADER DOCUMENTATION FOR LOADING PROCEDURE.

3.2 PROGRAM OPERATION

1. AFTER THE PROGRAM IS LOADED, A WAIT OF WILL OCCUR. AT THIS TIME, THE I/O DEVICE BY WHICH THE PROGRAM WAS LOADED, AND THE PROGRAM MODE ARE TO BE SELECTED VIA THE BIT SWITCHES. SEE TABLE A, WAIT 1.

   THE REASON THE DEVICE WHICH LOADED THE PROGRAM MUST BE SELECTED, IS THAT WITH THE C.E. INTERRUPT DELAY SWITCH IN THE ON POSITION, THE BASIC LOADER GENERATES A LEVEL 4 INTERRUPT WHICH CAN NOT BE SERVICED. WHEN THE C.E. INTERRUPT DELAY SWITCH IS TURNED OFF, TH LEVEL 4 INTERRUPT MUST BE SERVICED BEFORE ANY OTHER INTERRUPT CAN BE EXECUTED.

2. IF THE PROGRAM DETECTS NO ERRORS, AND THE AUTOMATIC LOOP RESET MODE IS NOT SELECTED, THE PROGRAM WILL HALT AT WAIT 4. IF A RERUN OF THE PROGRAM IS DESIRED, DEPRESS START.

3. ALL OTHER WAITS AND LOOPS ARE EXPLAINED IN TABLES A, B, AND C OF 3.3.

4. TO GO INTO A SCOPE LOOP AFTER A FAILURE HAS BEEN DETECTED, DEPRESS START. THE SCOPE LOOP IS SET UP FOR A 2 FEED/CYCLE PER SECOND RATE, AND A WAIT AFTER 100 FEED CYCLES HAVE BEEN EXECUTED. THE C.E. HAS AN OPTION TO CHANGE THESE VALVES. (SEE 3.4)

3.3 WAITS AND LOOPS

1. TABLE A - TEST 1 WAITS AND SCOPE LOOPS -

   WAIT 0--OP CODE 0000. NO TRANSFER TOOK PLACE FROM I/O BUSS TO B REG. LOGIC KM201.

   WAIT F--'INITIAL' DEVICE SELECTION AND PROGRAM MODE SELECTION.

   A. MAKE PROGRAM READ IN DEVICE READY.

   B. SELECT PROGRAM READ IN DEVICE, USING BIT SWITCHES. 0, 1, OR 2 AS FOLLOWS,

      1. BIT 0-ON AND BITS 1 AND 2 OFF.. 1442 READER
      2. BIT 1-ON AND BITS 0 AND 2 OFF.. P.T. READER
      3. BIT 2-ON AND BITS 0 AND 1 OFF.. 2501 READER

   C. IF AUTOMATIC RESET MODE IS DESIRED, SELECT LEVEL INVOLVED, USING BIT SWITCHES 4 THROUGH 7 AS FOLLOWS.

      1. LEVEL 0-BIT 4
      2. LEVEL 1-BIT 7
      3. LEVEL 2-BIT 6
      4. LEVEL 3-BITS 6 AND 7
      5. LEVEL 4-BIT 5
      6. LEVEL 5-BITS 5 AND 7
      7. NO BITS SELECTED - LEVEL AUTOMATIC RESET MODE WAS NOT SELECTED.

   D. DEPRESS START

   WAIT 1--DEVICE SELECTION

A. MAKE DESIRED DEVICE READY.

B. SELECT DESIRED DEVICE, USING BIT SWITCHES 0, 1, OR 2 AS FOLLOWS. TURN OFF BIT SW B, IF ON.

1. BIT 0-ON AND BITS 1 AND 2 OFF.. 1442 READER
2. BIT 1-ON AND BITS 0 AND 2 OFF.. P.T. READER
3. BIT 2-ON AND BITS 0 AND 1 OFF.. 2501 READER

C. DEPRESS START

WAIT 2--DESIRED NUMBER OF FEED CYCLES DURING SCOPE LOOP, MAKE SUR THERE ARE ENOUGH CARDS OR TAPE TO MAKE ANOTHER PASS. PUSH START TO CONTINUE SCOPE LOOP.

WAIT 3--DEVICE WENT NOT READY. LOAD CARDS OR TAPE AND PUSH START TO CONTINUE.

WAIT 4--DEVICE TESTED, RAN SUCCESSFULLY. TO RERUN TEST, DEPRESS START.

WAIT 5--THE 1442 IS THE DEVICE SELECTED ON WHICH THE TEST WILL BE RUN. IF SOME OTHER DEVICE IS DESIRED, AND THIS IS NOT THE INITIAL WAIT 5, MAKE NEW SELECTION, USING CONSOLE ENTRY SWITCHES. (SEE WAIT 1) TURN INTERRUPT DELAY SW. OFF IF IT IS ON, AND DEPRESS START IF PROG. DOES NOT START OPERATION BECAUSE OF A PENDING INTERRUPT.

WAIT 6--PAPER TAPE IS THE DEVICE SELECTED ON WHICH THE TEST WILL BE RUN. IF SOME OTHER DEVICE IS DESIRED, AND THIS IS NOT THE INITIAL WAIT 6, MAKE NEW SELECTION, USING CONSOLE ENTRY SWITCHES. (SEE WAIT 1) TURN INTERRUPT DELAY SW OFF IF IT IS ON, AND DEPRESS START IF PROG DOES NOT START OPERATING BECAUSE OF A PENDING INTERRUPT.

WAIT 7--THE 2501 IS THE DEVICE SELECTED ON WHICH THE TEST WILL BE RUN. IF SOME OTHER DEVICE IS DESIRED, AND THIS IS NOT THE INITIAL WAIT 7, MAKE NEW SELECTION, USING CONSOLE ENTRY SWITCHES. (SEE WAIT 1) TURN INTERRUPT DELAY SW OFF IF IT IS ON, AND DEPRESS START IF PROG DOES NOT START OPERATING BECAUSE OF A PENDING INTERRUPT.

WAIT 8--NO DEVICE WAS SELECTED. MAKE SELECTION USING CONSOLE ENTRY SWITCHES. (SEE WAIT 1) DEPRESS START.

WAIT A--1442 WAS DEVICE SELECTED AND IT WAS FOUND NOT READY. MAKE 1442 READY, AND DEPRESS START.

WAIT B--PAPER TAPE READER WAS DEVICE SELECTED AND FOUND NOT READY. MAKE P.T. READER READY, AND DEPRESS START.

WAIT C--2501 WAS DEVICE SELECTED AND IT WAS FOUND NOT READY. MAKE 2501 READY, AND DEPRESS START.

WAIT 11-NO INTERRUPTS GENERATED. PROGRAM IS CHECKING ABILITY TO SET RUN TRIGGER WITH INTERRUPT OCCURRING DURING A WAIT OP. TO FURTHER CHECK RUN TRIGGER WITH PROGRAM, PUSH START.

WAIT 12-NO INTERRUPT GENERATED. RUN TRIGGER HAS BEEN ELIMINATED AS CAUSE OF FAILURE. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM321.

WAIT 13-DROPPED ADDR BIT 13 WHEN GATING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 14-A LEVEL 1 INTERRUPT ADDRESS WAS GENERATED. TO GO INTO

SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 15-A LEVEL 2 INTERRUPT ADDRESS WAS GENERATED. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 16-A LEVEL 3 INTERRUPT ADDRESS WAS GENERATED. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 17-PICK ADDR BIT 15 WHEN GATING INTERRUPT ADDR FROM I/O BUSS TO B REG DURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 18-DROPPED ADDR BIT 12 WHEN GATING INTERRUPT ADDR FROM I/O BUSS TO B REG DURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP PUSH START. LOGIC KM201.

WAIT 19-PICKED ADDR BIT 14 WHEN GATING INTERRUPT ADDR FROM I/O BUSS TO B REG DURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP PUSH START. LOGIC KM201.

WAIT 1A-NO INTERRUPT ADDR BITS GATED FROM I/O BUSS TO B REG DURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 1C-INTERRUPT OPERATION WAS NORMAL WHEN MASKING OUT WAIT OP. SUSPECT RUN TRIGGER IS NOT BEING SET. PUSHING START WILL CAUSE 1 FEED CYCLE EACH TIME IT IS PUSHED. LOGIC KA101.

LOOP LEVEL 0 ON-LEVEL 0 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH THE PROG TRYING TO RESET IT. LOGIC KM201.

LOOP LEVEL 1 ON-LEVEL 1 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH THE PROGRAM TRYING TO RESET IT. LOGIC KM201.

LOOP LEVEL 2 ON-LEVEL 2 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH THE PROGRAM TRYING TO RESET IT. LOGIC KM201.

LOOP LEVEL 3 ON-LEVEL 3 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH THE PROGRAM TRYING TO RESET IT. LOGIC KM201.

LOOP LEVEL 5 ON-LEVEL 5 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH PROGRAM TRYING TO RESET IT. LOGIC KM201.

2. TABLE B - TEST 2 WAITS AND SCOPE LOOPS

WAIT 21-NO INTERRUPTS WERE GENERATED WITHIN 500 MSEC. AFTER A CARD IS FED. THIS SHOULD HAVE BEEN ENOUGH TIME TO RECEIV 80 COLUMN INTERRUPTS AND AN END OF INTERRUPT. TO GO INTO SCOPE LOOP, PUSH START. IF AN INTERRUPT IS GENERATED DURING THE SCOPE LOOP, A WAIT WILL IDENTIFY IT LOGIC KM30

WAIT 22-NO LEVEL 4 INTERRUPT WAS GENERATED AFTER AT LEAST 1 COLUMN INTERRUPT WAS RECEIVED. THE ACTUAL NUMBER OF COLUMN INTERRUPTS IS DISPLAYED IN THE A REG. POSSIBLE CAUSE COULD BE LEVEL 0 NOT BEING RESET. TO GO INTO SCOPE LOOP, PUSH START LOGIC KM321.

WAIT 23-MORE THAN 80 COLUMN INTERRUPTS WERE RECEIVED WHEN END OP WAS GENERATED. THE ACTUAL NUMBER OF COLUMN INTERRUPTS IS DISPLAYED IN THE A REG. POSSIBLE CAUSE COULD BE DEVICE EMITTER. TO GO INTO SCOPE LOOP, PUSH START.

WAIT 24-LESS THAN 80 COLUMN INTERRUPTS WERE RECEIVED WHEN END

OP WAS GENERATED. THE ACTUAL NUMBER OF COLUMN INTERRUPTS IS DISPLAYED IN THE A REG. POSSIBLE CAUSE COULD BE DEVICE EMITTER. TO GO INTO SCOPE LOOP, PUSH START.

WAIT 25-INTERRUPT GENERATED CAUSE A LEVEL 1 ADDRESS TO BE GENERATED. POSSIBLE CAUSE COULD BE THAT ADDRESS BIT 15 WAS PICKED WHEN TRANSFERRING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVEL 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 26-INTERRUPT GENERATE CAUSE A LEVEL 2 ADDRESS TO BE GENERATE POSSIBLE CAUSE COULD BE THAT ADDRESS BIT 14 WAS PICKED WH TRANSFERRING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVEL 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 27-INTERRUPT GENERATED CAUSED A LEVEL 3 ADDRESS TO BE GENERATED. POSSIBLE CAUSE COULD BE THAT ADDRESS BITS 14 AND 15 WERE PICKED WHEN TRANSFERRING INTERRUPT ADDRESS FROOM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVE 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 28-INTERRUPT GENERATED CAUSED A LEVEL 3 ADDRESS TO BE PICKED WHEN TRANSFERRING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVEL 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 29-BIT 12 WAS DROPPED WHEN TRANSFERRING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVEL 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201

3. TABLE C - AUTOMATIC LOOP RESET MODE WAITS

WAIT 3F - AUTOMATIC LOOP RESET MODE SELECTED. TURN C.E. INTERRUPT DELAY SWITCH OFF. THIS SHOULD CAUSE AN AUTOMATIC RESET LOOP FOR THE LEVEL SELECTED IN BIT SWITCHES 4 THROUGH 7 LOGIC KT311.

WAIT 30 - LEVEL 0 WAS SELECTED IN AUTOMATIC RESET LOOP MODE. A RESET OF THIS LEVEL DID OCCUR. DEPRESS START TO GO TO WAIT 1.

WAIT 31 - LEVEL 1 WAS SELECTED IN AUTOMATIC RESET LOOP MODE. A RESET OF THIS LEVEL DID OCCUR. DEPRESS START TO GO TO WAIT 1.

WAIT 32 - LEVEL 2 WAS SELECTED IN AUTOMATIC RESET LOOP MODE. A RESET OF THIS LEVEL DID OCCUR. DEPRESS START TO GO TO WAIT 1.

WAIT 33 - LEVEL 3 WAS SELECTED IN AUTOMATIC RESET LOOP MODE. A RESET OF THIS LEVEL DID OCCUR. DEPRESS START TO GO TO WAIT 1.

WAIT 34 - LEVEL 4 WAS SELECTED IN AUTOMATIC RESET LOOP MODE. A RESET OF THIS LEVEL DID OCCUR. DEPRESS START TO GO TO WAIT 1.

WAIT 35 - LEVEL 5 WAS SELECTED IN AUTOMATIC RESET LOOP MODE. A RESET OF THIS LEVEL DID OCCUR. DEPRESS START TO GO TO WAIT 1.

3.4 C.E. SCOPE LOOP OPTIONS

1. THE FEED CYCLE RATE IS PROGRAMED FOR 2 CYCLE PER SECOND. THIS RATE CAN BE CHANGED BY THE C.E. THROUGH THE SETTING OF BIT SWITCHES 8, 9, 10, OR 11 AS FOLLOWS

   1. BIT SW.8 ON - 4 CYCLES PER SECOND.
   2. BIT SW.9 ON - 8 CYCLES PER SECOND.
   3. BIT SW10 ON - 16 CYCLES PER SECOND.
   4. BIT SW11 ON - MAX PROGRAMED SPEED.
   5. NO SWS ON - 2 CYCLES PER SECOND.

   THESE SWITCHES MAY BE CHANGED AT ANY TIME DURING SCOPE LOOP.

2. THE NUMBER OF FEED CYCLES BETWEEN WAIT TWOS ARE PROGRAMED FOR 100. THIS NUMBER CAN BE CHANGED BY THE C.E. THROUGH THE SETTING OF BIT SWITCHES 12, 13, 14, OR 15 AS FOLLOWS.

   1. BIT 12 ON - 25000 FEED CYCLES
   2. BIT 13 ON - 250 FEED CYCLES
   3. BIT 14 ON - 50 FEED CYCLES
   4. BIT 15 ON - 10 FEED CYCLES
   5. NO BITS ON - 100 FEED CYCLES

   THE SWITCHES MAY BE CHANGED AT ANY TIME DURING THE SCOPE LOOP.

3. THE C.E. HAS THE OPTION TO TERMINATE THE SCOPE LOOP AND RETURN TO WAIT 1 FOR ANY NEW SET UP BY TURNING ON BIT SWITCH 03.

4. PRINTOUTS (NONE)
5. PROGRAM PHILOSOPHY

   INTERRUPT TEST WILL BE RUN AFTER PROBLEMS ARE ENCOUNTERED WHEN TRYING TO LOAD A PROGRAM WITH THE BASIC LOADER IN THE LOAD AND GO MODE. THE CE INTERRUPT DELAY SWITCH IS THEN PLACED IN THE ON POSITION AND THE C.P.U. TEST IS THEN LOADED, AGAIN USING THE BASIC LOADER. THE SWITCH BEING ON, ALLOWS THE C.P.U. TEST TO BE LOADED WITHOUT THE INTERRUPT CIRCUITRY. IF THE C.P.U. TEST RUNS SUCCESSFULLY, THEN THE INTERRUPT CIRCUITRY WOULD BECOME THE PRIME AREA OF SUSPICION AS CAUSE OF THE LOADING PROBLEM. THE INTERRUPT TEST WOULD THEN BE RUN NEXT.

   THE INTERRUPT TEST DOES NOT CHECK ON DATA TRANSFER, BUT DOES CHECK THE PROPER OPERATION OF THE INTERRUPT FORCED BRANCH INSTRUCTION AND THE PROPER LEVEL INTERRUPT ADDRESS. IN MOST CASES, AFTER THE TEST LOCATES THE PROBLEM AND IDENTIFIES IT WITH THE PROPER WAIT, A SCOPING LOOP CAN BE ENTERED BY DEPRESSING START. THE C.E. HAS 3 OPTIONS AT HIS CONTROL WHILE IN THE SCOPING LOOP. THESE ARE.

   1. DELAY BETWEEN FEED CYCLES
   2. NUMBER OF FEED CYCLES BETWEEN WAIT 2
   3. AN OPTION TO SELECT ANOTHER DEVICE IF THERE IS ONE AVAILABLE

   THE INTERRUPT TEST ALSO ALLOWS THE C.E. TO SELECT AN AUTOMATIC LEVEL RESET LOOP MODE. THIS OPTION IS TO BE USED WHEN A LEVEL CANNOT BE RESET. IF THIS WERE THE CASE, MOST OF THE PROGRAM'S TIME WOULD BE SPENT TRYING TO SERVICE THE INTERRUPT LEVEL AND PROGRAM OPERATION WOULD BE VERY ERRATIC. THEREFORE, THIS OPTION IS SET UP WITH A MINIMUM OF PROGRAM STEPS AFTER THE C.E. INTERRUPT DELAY SWITCH IS TURNED OFF. IF THE INTERRUPT LEVEL IS RESET, A WAIT WILL INDICATE SO.

   THE INTERRUPT TEST AIDS IN LOCATING PROBLEMS IN 3 BASIC AREAS. THEY ARE.

   1. LEVEL 4 (END OP) OF THE READ IN DEVICES
   2. LEVEL 0 (COLUMN) OF THE 1442
   3. LEVELS WHICH CANNOT BE RESET

LEVEL 4 - AT THE END OF A FEED OPERATION, THIS INTERRUPT IS GENERATED. THE TEST TRAPS SUCH FAILURES AS. NO INTERRUPT GENERATED DURING A WAIT OP, NO INTERRUPT GENERATED WHILE PROGRAM IS RUNNING, NO TRANSFER OF BSI L INSTRUCTION BITS OR INTERRUPT ADDRESS BITS FROM I/O BUSS TO B REG, DROPPING OR PICKING BITS BETWEEN I/O BUSS AND B REG, AND THE DETECTION OF AN INTERRUPT LEVEL NOT BEING RESET WHILE THIS TEST IS BEING RUN. ALL READ/IN DEVICES USE THIS PHASE OF THE TEST AND THE WAITS ARE IDENTIFIED BY WAIT 1X WHERE X IS THE PROBLEM IDENTIFIER.

LEVEL 0 - THE 1442 IS THE ONLY READ/IN DEVICE USING THIS PHASE OF THE TEST. THE TEST TRAPS PROBLEMS AS. NO INTERRUPT GENERATED, NO LEVEL 4 INTERRUPT GENERATED AFTER AT LEAST 1 LEVEL 0 INTERRUPT, PICKED OR DROPPED ADDRESS BITS ASSOCIATED WITH A LEVEL 0 INTERRUPT, LESS THAN 80 COLUMN INTERRUPTS BEFORE AN END OP, AND MORE THAN 80 COLUMNS BEFORE AN END OP. THE WAITS ASSOCIATED WITH THIS PHASE ARE-WAIT 2X, WHERE X IDENTIFIES THE PROBLEM.

AUTOMATIC LEVEL RESET LOOP - ALLOW SCOPING OF LEVELS WHICH CANNOT BE RESET. THIS MODE IS IDENTIFIED BY WAIT 3F. IF THE LEVEL IS RESET WHILE LOOPING, THE PROGRAM WILL WAIT. THE WAITS ASSOCIATED WITH THIS PHASE ARE-WAIT 3X, WHERE X IDENTIFIES THE LEVEL. DEPRESSING START WILL CAUSE THE PROGRAM TO GO TO WAIT 1, WHERE A NEW SETUP CAN BE MADE.

THE TEST IS DYNAMIC WHILE TESTING LEVEL 0 AND LEVEL 4 INTERRUPT OPERATION. IF AN INTERMITTENT FAILURE IS ENCOUNTERED, THE PROGRAM WILL INDICATE EACH FAILURE. IF THE TEST IS IN A SCOPE LOOP AND THE TROUBLE DISAPPEARS, THE PROGRAM AUTOMATICALLY RECOVERS AND TRIES TO COMPLETE A SUCCESSFUL RUN OR TRAP ANY OTHER FAILURE THAT MIGHT OCCUR.

6. APPENDIX (NONE)

INTERRUPT TEST

```
                        ABS                                          3A800000
02BC                    ORG     /500                                 3A800010
0500 0  1000    BEGIN NOP                                            3A800020
                *                                                    3A800030
0501 0  300F    WAITF WAIT    /F                                     3A800040
                ***********************************************      3A800050
                *                                             *      3A800060
                *                  WAIT F                     *      3A800070
                *                                             *      3A800080
                * IF PROGRAM IS BEING RUN BECAUSE AN INTRPT *         3A800090
                * INDICATOR IS NOT BEING CLEARED, SET CONSOLE*        3A800100
                * ENTRY SWITCHES 4---7 TO IDENTIFY LEVEL AT *         3A800110
                * FAULT AND SELECT DEVICE TO BE USED IN TEST*         3A800120
                * MAKE DEVICE READY AND PUSH START.         *         3A800130
                *                                           *         3A800140
                * IF PROGRAM IS BEING RUN BECAUSE OF SOME   *         3A800150
                * OTHER REASON THAN STATED ABOVE,           *         3A800160
                *    A. SELECT DEVICE VIA CONSOLE SWITCHES  *         3A800170
                *       0---2.                              *         3A800180
                *    B. MAKE DEVICE READY.                  *         3A800190
                *    C. PRESS START.                        *         3A800200
                * NOTE INITIAL WAIT F , SELECT PROGRAM READ *         3A800210
                * IN DEVICE                                 *         3A800220
                ***********************************************      3A800230
                *                                             *      3A800240
                ***********************************************      3A800250
                * INTERRUPT VECTOR SETUP.                   *         3A800260
                ***********************************************      3A800270
                *                                                    3A800280
0502 00 65000734 MAPIT LDX  L1 VEC00                                 3A800290
0504 00 6D000008       STX  L1 /0008      LEVEL 0                    3A800300
0506 00 65000744       LDX  L1 VEC01                                 3A800310
0508 00 6D000009       STX  L1 /0009      LEVEL 1                    3A800320
050A 00 65000754       LDX  L1 VEC02                                 3A800330
050C 00 6D00000A       STX  L1 /000A      LEVEL 2                    3A800340
050E 00 65000764       LDX  L1 VEC03                                 3A800350
0510 00 6D00000B       STX  L1 /000B      LEVEL 3                    3A800360
0512 00 65000770       LDX  L1 VEC04                                 3A800370
0514 00 6D00000C       STX  L1 /000C      LEVEL 4                    3A800380
0516 00 650007BB       LDX  L1 VEC05                                 3A800390
0518 00 6D00000D       STX  L1 /000D      LEVEL 5                    3A800400
051A 00 650007DB       LDX  L1 BAD12                                 3A800410
051C 00 6D000004       STX  L1 /0004      BIT 12 DROPPED             3A800420
051E 00 650007E7       LDX  L1 BAD14                                 3A800430
0520 00 6D00000E       STX  L1 /000E      BIT 14 PICKED              3A800440
0522 00 650007F3       LDX  L1 NOADR                                 3A800450
0524 00 6D000000       STX  L1 /0000      NO INTERRUPT ADDR          3A800460
                *                                                    3A800470
0526 0  7001           MDX     WHICH                                 3A800480
                *                                                    3A800490
0527 0  3001    WAIT1 WAIT    1                                      3A800500
                ***********************************************      3A800510
                *                                             *      3A800520
                *                  WAIT 1                     *      3A800530
                *                                             *      3A800540
                *    A. SELECT DEVICE VIA CONSOLE SWITCHES    *      3A800550
                *       0---2.                                *      3A800560
                *    B. MAKE DEVICE READY.                    *      3A800570
                *    C. PRESS START.                          *      3A800580
                *                                             *      3A800590
                ***********************************************      3A800600
                *                                                    3A800610
0528 00 65001000 WHICH LDX  L1 /1000                                 3A800620
052A 0  69F8           STX   1 WAIT1-1                               3A800630
052B 00 0L000A66       XIO  L  BITSW      READ BIT SWITCHES          3A800640
052D 00 C4000A77       LD   L  BITS1      LOAD BIT SWITCHES          3A800650
052F 0  180C           SRA     12         SET UP FOR DEVICE          3A800660
0530 00 D4000A78       STO  L  BITS2                                 3A800670
```


INTERRUPT TEST

```
0532 0  1801           SRA     1                                     3A800680
0533 00 4C0405CB       BSC  L  WHAT3,E    CHECK FOR 2501             3A800690
0535 0  1801           SRA     1                                     3A800700
0536 00 4C0405C1       BSC  L  WHAT2,E    CHECK FOR PAPER TAPE       3A800710
0538 0  1801           SRA     1                                     3A800720
0539 00 4C0405B8       BSC  L  WHAT1,E    CHECK FOR 1442             3A800730
                *                                                    3A800740
                ***********************************************      3A800750
                *                                             *      3A800760
                *                  WAIT 8                     *      3A800770
                *                                             *      3A800780
                * NO DEVICE WAS FOUND TO BE SELECTED.       *        3A800790
                * MAKE SELECTION AND PRESS START.           *        3A800800
                *                                           *        3A800810
                ***********************************************      3A800820
                *                                                    3A800830
053B 0  3008    WAIT8 WAIT    8          NO DEVICE SELECTED         3A800840
053C 00 4C000528       BSC  L  WHICH      SET UP TO CHK AGAIN        3A800850
                *                                                    3A800860
053E 00 0C000A66 CKLOP XIO  L  BITSW      READ BIT SWITCHES          3A800870
0540 00 C4000A77       LD   L  BITS1      LOAD BIT SWITCHES          3A800880
0542 0  1808           SRA     8          LEVEL ON CHECK             3A800890
0543 00 D4000A79       STO  L  BITS3      LEVEL CHECK BITS           3A800900
0545 0  1803           SRA     3          CHECK FOR LEVEL 0 ON       3A800910
0546 00 4C040580       BSC  L  VECT0,E    SET UP LEVEL 0 LOOP        3A800920
0548 00 C4000A79       LD   L  BITS3      LEVEL CHECK BITS           3A800930
054A 00 4C040578       BSC  L  CKBIT,E    NUM OF LEVEL IS ODD        3A800940
054C 0  1801           SRA     1          CHECK FOR LEVEL 2 ON       3A800950
054D 00 4C040590       BSC  L  VECT2,E    SET UP LEVEL 2 LOOP        3A800960
054F 0  1801           SRA     1          CHECK FOR LEVEL 4 ON       3A800970
0550 00 4C0405A4       BSC  L  VECT4,E    SET UP LEVEL 4 LOOP        3A800980
0552 00 4C0006AE       BSC  L  CLRIX      NO RESET LOOP SEL.         3A800990
                *                                                    3A801000
                ***********************************************      3A801010
                *                  WAIT 3F                    *      3A801020
                * LEVEL RESET LOOP OPTION HAS BEEN CHOSEN.  *        3A801030
                * TURN C.E. INTERRUPT SWITCH - OFF. THIS    *        3A801040
                * SHOULD SET UP AN AUTOMATIC RESET LOOP FOR *        3A801050
                * DEVICE AND LEVEL SELECTED,FOR SCOPE/WORK. *        3A801060
                ***********************************************      3A801070
                *     RESTORE LEVEL RESET LOOP WAITS          *      3A801080
                ***********************************************      3A801090
0554 00 65003030 GOLOP LDX  L1 /3030                                 3A801100
0556 00 6D000739       STX  L1 MOD13      RESTORE WAIT 30            3A801110
0558 00 65003031       LDX  L1 /3031                                 3A801120
055A 00 6D000749       STX  L1 MOD14      RESTORE WAIT 31            3A801130
055C 00 65003032       LDX  L1 /3032                                 3A801140
055E 00 6D000759       STX  L1 MOD15      RESTORE WAIT 32            3A801150
0560 00 65003033       LDX  L1 /3033                                 3A801160
0562 00 6D000769       STX  L1 MOD16      RESTORE WAIT 33            3A801170
0564 00 65003035       LDX  L1 /3035                                 3A801180
0566 00 6D0007C0       STX  L1 MOD17      RESTORE WAIT 35            3A801190
                *                                                    3A801200
0568 00 C4C0091E       LD   L  MOD12+1    SET UP WAIT 1 RETURN       3A801210
056A 00 D400073F       STO  L  MOD13+6                               3A801220
056C 00 D400074F       STO  L  MOD14+6                               3A801230
056E 00 D400075F       STO  L  MOD15+6                               3A801240
0570 00 D400076F       STO  L  MOD16+6                               3A801250
0572 00 D40007C6       STO  L  MOD17+6                               3A801260
                *                                                    3A801270
0574 0  303F    LOOPS WAIT    /3F                                    3A801280
0575 00 4C000527       BSC  L  WAIT1      *-*                        3A801290
0577 0  70FD           MDX     LOOPS+1                               3A801300
                *                                                    3A801310
0578 0  1801    CKBIT SRA     1          CHECK FOR LEVEL 3 ON       3A801320
0579 00 4C04059A       BSC  L  VECT3,E    SET UP LEVEL 3 LOOP        3A801330
057B 0  1801           SRA     1          CHECK FOR LEVEL 5          3A801340
057C 00 4C0405AE       BSC  L  VECT5,E    SET UP LEVEL 5 LOOP        3A801350
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057E 00 4C000586          BSC  L  VECT1      SET UP LEVEL 1 LOOP          3A801360
                          *                                               3A801370
0580 00 65000731  VECT0 LDX  L1 LOOP0+1                                   3A801380
0582 00 6D000576        STX  L1 LOOPS+2      SET LEV LOOP VECTOR          3A801390
0584 00 4C000554        BSC  L  GOLOP        SET UP,GO TO WAIT 3F         3A801400
                          *                                               3A801410
0586 00 65000741  VECT1 LDX  L1 LOOP1+1                                   3A801420
0588 00 6D000576        STX  L1 LOOPS+2      SET LEV LOOP VECTOR          3A801430
058A 00 65000740        LDX  L1 LOOP1                                     3A801440
058C 00 6D000009        STX  L1 /0009                                     3A801450
058E 00 4C000554        BSC  L  GOLOP        SET UP,GO TO WAIT 3F         3A801460
                          *                                               3A801470
0590 00 65000751  VECT2 LDX  L1 LOOP2+1                                   3A801480
0592 00 6D000576        STX  L1 LOOPS+2      SET LEV LOOP VECTOR          3A801490
0594 00 65000751        LDX  L1 LOOP2+1                                   3A801500
0596 00 6D00000A        STX  L1 /000A                                     3A801510
0598 00 4C000554        BSC  L  GOLOP        SET UP,GO TO WAIT 3F         3A801520
                          *                                               3A801530
059A 00 65000761  VECT3 LDX  L1 LOOP3+1                                   3A801540
059C 00 6D000576        STX  L1 LOOPS+2      SET LEV LOOP VECTOR          3A801550
059E 00 65000760        LDX  L1 LOOP3                                     3A801560
05A0 00 6D00000B        STX  L1 /000B                                     3A801570
05A2 00 4C000554        BSC  L  GOLOP        SET UP,GO TO WAIT 3F         3A801580
                          *                                               3A801590
05A4 00 6500081E  VECT4 LDX  L1 LOOP4+1                                   3A801600
05A6 00 6D000576        STX  L1 LOOPS+2      SET LEV LOOP VECTOR          3A801610
05A8 00 6500081D        LDX  L1 LOOP4                                     3A801620
05AA 00 6D00000C        STX  L1 /000C                                     3A801630
05AC 00 4C000554        BSC  L  GOLOP        SET UP,GO TO WAIT 3F         3A801640
                          *                                               3A801650
05AE 00 65000788  VECT5 LDX  L1 LOOP5+1                                   3A801660
05B0 00 6D000576        STX  L1 LOOPS+2      SET LEV LOOP VECTOR          3A801670
05B2 00 65000787        LDX  L1 LOOP5                                     3A801680
05B4 00 6D00000D        STX  L1 /000D                                     3A801690
05B6 00 4C000554        BSC  L  GOLOP        SET UP,GO TO WAIT 3F         3A801700
                          *                                               3A801710
05B8 00 0C000A58  WHAT1 XIO  L  SENSE        SENSE 1442 READY             3A801720
05BA 00 4C0405BE        BSC  L  NRDYA,E      CHK NOT READY                3A801730
05BC 00 4C0005D4        BSC  L  SET42        SET UP 1442 PROG VEC         3A801740
                          **********************************************  3A801750
                          *                WAIT A                       *  3A801760
                          * 1442 SELECTED AND NOT READY. MAKE IT READY*   3A801770
                          * OR SOME OTHER DEVICE SELECTION VIA CONSOLE*   3A801780
                          * ENTRY SWITCHES. PUSH START.                *  3A801790
                          **********************************************  3A801800
05BE 0  300A      NRDYA WAIT   /A            SEL 1442/NOT READY           3A801810
05BF 00 4C000528        BSC  L  WHICH        CHK DEVICE AGAIN             3A801820
                          *                                               3A801830
05C1 00 0C000A5A  WHAT2 XIO  L  SENPT        SENSE P.T. READY             3A801840
05C3 0  180A            SRA     10                                        3A801850
05C4 00 4C0405C8        BSC  L  NRDYB,E      CHK NOT READY                3A801860
05C6 00 4C00061E        BSC  L  SETPT        SET UP P.T. PROG VEC         3A801870
                          **********************************************  3A801880
                          *                WAIT B                       *  3A801890
                          * P.T. SELECTED AND NOT READY. MAKE IT READY*   3A801900
                          * OR SOME OTHER DEVICE SELECTION VIA CONSOLE*   3A801910
                          * ENTRY SWITCHES. PUSH START.                *  3A801920
                          **********************************************  3A801930
05C8 0  300B      NRDYB WAIT   /B            SEL P.T./NOT READY           3A801940
05C9 00 4C000528        BSC  L  WHICH        CHK DEVICE AGAIN             3A801950
                          *                                               3A801960
05CB 00 0C000A5C  WHAT3 XIO  L  SEN25        SENSE 2501 READY             3A801970
05CD 00 4C0405D1        BSC  L  NRDYC,E      CHK NOT READY                3A801980
05CF 00 4C000666        BSC  L  SET25        SET UP 2501 PROG VEC         3A801990
                          **********************************************  3A802000
                          *                WAIT C                       *  3A802010
                          * 2501 SELECTED AND NOT READY. MAKE IT READY*   3A802020
                          * OR SOME OTHER DEVICE SELECTION VIA CONSOLE*   3A802030
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                          * ENTRY SWITCHES. PUSH START.                *  3A802040
                          **********************************************  3A802050
05D1 0  300C      NRDYC WAIT   /C            SEL 2501/NOT READY           3A802060
05D2 00 4C000528        BSC  L  WHICH        CHK DEVICE AGAIN             3A802070
                          *                                               3A802080
05D4 00 65000A58  SET42 LDX  L1 SENSE        SET UP 1442 SENSE WD         3A802090
05D6 00 6D0006DC        STX  L1 BUSY+1                                    3A802100
05D8 00 6D0006EA        STX  L1 TEST1+3                                   3A802110
05DA 00 6D00072A        STX  L1 WAITG+2                                   3A802120
05DC 00 6D000736        STX  L1 VEC00+2                                   3A802130
05DE 00 6D000746        STX  L1 VEC01+2                                   3A802140
05E0 00 6D000756        STX  L1 VEC02+2                                   3A802150
05E2 00 6D000766        STX  L1 VEC03+2                                   3A802160
05E4 00 6D000772        STX  L1 VEC04+2                                   3A802170
05E6 00 6D00078D        STX  L1 VEC05+2                                   3A802180
05E8 00 6D0007C9        STX  L1 CKDOK+2                                   3A802190
05EA 00 6D0007DD        STX  L1 BAD12+2                                   3A802200
05EC 00 6D0007E9        STX  L1 BAD14+2                                   3A802210
05EE 00 6D0007F5        STX  L1 NOADR+2                                   3A802220
05F0 00 6D000802        STX  L1 DSWCK+3                                   3A802230
05F2 00 6D00080B        STX  L1 DSWCK+12                                  3A802240
                          *                                               3A802250
05F4 00 65800A8C        LDX  I1 SRA01        SET UP 1442 BUSY CHK         3A802260
05F6 00 6D0006DD        STX  L1 BUSY+2                                    3A802270
                          *                                               3A802280
05F8 00 65800A8B        LDX  I1 NOPIT        SET UP 1442 CONTROLS         3A802290
05FA 00 6D0006EB        STX  L1 TEST1+4                                   3A802300
05FC 00 6D000803        STX  L1 DSWCK+4                                   3A802310
05FE 00 6D00080C        STX  L1 DSWCK+13                                  3A802320
                          *                                               3A802330
0600 00 65000A6A        LDX  L1 FEED         SET UP 1442 XIO              3A802340
0602 00 6D0006EF        STX  L1 TEST1+8                                   3A802350
                          *                                               3A802360
0604 00 65000A85        LDX  L1 K100         SET UP 1442 LOOP CNT         3A802370
0606 00 6D0006FE        STX  L1 NUMBR+1                                   3A802380
0608 00 6D000723        STX  L1 NUMCK+1                                   3A802390
                          *                                               3A802400
060A 00 65000A82        LDX  L1 K010         SET UP 1442 GOOD CNT         3A802410
060C 00 6D0007A9        STX  L1 FINSH+1                                   3A802420
                          *                                               3A802430
060E 00 65000829        LDX  L1 SETUP        SET UP 1442 TEST VEC         3A802440
0610 00 6D0007AB        STX  L1 FINSH+3                                   3A802450
                          *                                               3A802460
                          **********************************************  3A802470
                          *                                            *  3A802480
                          *                WAIT 5                      *  3A802490
                          *                                            *  3A802500
                          * 1442 WAS FOUND READY AND WILL BE THE       *  3A802510
                          * DEVICE USED IN THE TEST.                   *  3A802520
                          * IF INTERRUPT DELAY SW ON, TURN OFF         *  3A802530
                          * IF PROGRAM DOES NOT START RUNNING BECAUSE  *  3A802540
                          * OF A PENDING INTERRUPT, DEPRESS START.     *  3A802550
                          *                                            *  3A802560
                          **********************************************  3A802570
0612 0  3005              WAIT   5           1442 SELECTED                3A802580
0613 00 0C000A66          XIO  L  BITSW        READ BIT SWITCHES            3A802590
0615 00 C4000A77          LD   L  BITS1        LOAD BIT SWITCHES            3A802600
0617 0  180C              SRA     12                                        3A802610
0618 00 94000A78          S    L  BITS2        LAST DEVICE SELECTED         3A802620
061A 00 4C18053E          BSC  L  CKLOP,+-     CHK FOR LEVEL LOOP           3A802630
061C 00 4C000528          BSC  L  WHICH        NEW DEVICE SELECTED          3A802640
                          *                                               3A802650
061E 00 65000A5A  SETPT LDX  L1 SENPT        SET UP PT SENSE WD           3A802660
0620 00 6D0006DC        STX  L1 BUSY+1                                    3A802670
0622 00 6D0006EA        STX  L1 TEST1+3                                   3A802680
0624 00 6D00072A        STX  L1 WAITG+2                                   3A802690
0626 00 6D000736        STX  L1 VEC00+2                                   3A802700
0628 00 6D000746        STX  L1 VEC01+2                                   3A802710
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062A 00 6D000756          STX  L1 VEC02+2                          3A802720
062C 00 6D000766          STX  L1 VEC03+2                          3A802730
062E 00 6D000772          STX  L1 VEC04+2                          3A802740
0630 00 6D00078D          STX  L1 VEC05+2                          3A802750
0632 00 6D0007C9          STX  L1 CKDOK+2                          3A802760
0634 00 6D0007DD          STX  L1 BAD12+2                          3A802770
0636 00 6D0007E9          STX  L1 BAD14+2                          3A802780
0638 00 6D0007F5          STX  L1 NOADR+2                          3A802790
063A 00 6D000802          STX  L1 DSWCK+3                          3A802800
063C 00 6D00080B          STX  L1 DSWCK+12                         3A802810
                *                                                  3A802820
063E 00 65800A8E          LDX  I1 SRA11      SET UP P.T. BUSY CHK  3A802830
0640 00 6D0006DD          STX  L1 BUSY+2                           3A802840
                *                                                  3A802850
0642 00 65800A8D          LDX  I1 SRA10      SET UP P.T. RDY CHK   3A802860
0644 00 6D0006EB          STX  L1 TEST1+4                          3A802870
0646 00 6D000803          STX  L1 DSWCK+4                          3A802880
0648 00 6D00080C          STX  L1 DSWCK+13                         3A802890
                *                                                  3A802900
064A 00 65000A72          LDX  L1 CNTRL      SET UP P.T. XIO       3A802910
064C 00 6D0006EF          STX  L1 TEST1+8                          3A802920
                *                                                  3A802930
064E 00 65000A85          LDX  L1 K100       SET UP P.T. CHAR CNT  3A802940
0650 00 6D0006FE          STX  L1 NUMBR+1                          3A802950
0652 00 6D000723          STX  L1 NUMCK+1                          3A802960
0654 00 6D0007A9          STX  L1 FINSH+1                          3A802970
                *                                                  3A802980
0656 00 65000912          LDX  L1 WAITA      SET UP P.T. TEST VEC  3A802990
0658 00 6D0007AB          STX  L1 FINSH+3                          3A803000
                *                                                  3A803010
                ************************************************ 3A803020
                *                                              * 3A803030
                *                  WAIT 6                      * 3A803040
                *                                              * 3A803050
                * PAPER TAPE WAS FOUND READY AND WILL BE THE   * 3A803060
                * DEVICE USED IN THE TEST.                     * 3A803070
                * IF INTERRUPT DELAY SW ON, TURN OFF           * 3A803080
                * IF PROGRAM DOES NOT START RUNNING BECAUSE    * 3A803090
                * OF A PENDING INTERRUPT, DEPRESS START.       * 3A803100
                *                                              * 3A803110
                ************************************************ 3A803120
065A 0  3006              WAIT    6          PAPER TAPE SELECTED   3A803130
065B 00 0C000A66          XIO  L  BITSW      READ BIT SWITCHES     3A803140
065D 00 C4000A77          LD   L  BITS1      LOAD BIT SWITCHES     3A803150
065F 0  180C              SRA     12                               3A803160
0660 00 94000A78          S    L  BITS2      LAST DEVICE SELECTED  3A803170
0662 00 4C18053E          BSC  L  CKLOP,+-   CHK FOR LEVEL LOOP    3A803180
0664 00 4C000528          BSC  L  WHICH      NEW DEVICE SELECTED   3A803190
                *                                                  3A803200
0666 00 65000A5C  SET25   LDX  L1 SEN25      SET UP 2501 SENSE WD  3A803210
0668 00 6D0006DC          STX  L1 BUSY+1                           3A80322C
066A 00 6D0006EA          STX  L1 TEST1+3                          3A803230
066C 00 6D00072A          STX  L1 WAITG+2                          3A803240
066E 00 6D000736          STX  L1 VEC00+2                          3A803250
0670 00 6D000746          STX  L1 VEC01+2                          3A803260
0672 00 6D000756          STX  L1 VEC02+2                          3A803270
0674 00 6D000766          STX  L1 VEC03+2                          3A803280
0676 00 6D000772          STX  L1 VEC04+2                          3A803290
0678 00 6D00078D          STX  L1 VEC05+2                          3A803300
067A 00 6D0007C9          STX  L1 CKDOK+2                          3A803310
067C 00 6D0007DD          STX  L1 BAD12+2                          3A803320
067E 00 6D0007E9          STX  L1 BAD14+2                          3A803330
0680 00 6D0007F5          STX  L1 NOADR+2                          3A803340
0682 00 6D000802          STX  L1 DSWCK+3                          3A803350
0684 00 6D00080B          STX  L1 DSWCK+12                         3A803360
                *                                                  3A803370
0686 00 65800A8C          LDX  I1 SRA01      SET UP 2501 BUSY CHK  3A803380
0688 00 6D0006DD          STX  L1 BUSY+2                           3A803390
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                *                                                  3A803400
068A 00 65800A8B          LDX  I1 NOPIT      SET UP 2501 CONTROLS  3A803410
068C 00 6D0006EB          STX  L1 TEST1+4                          3A803420
068E 00 6D000803          STX  L1 DSWCK+4                          3A803430
0690 00 6D00080C          STX  L1 DSWCK+13                         3A803440
                *                                                  3A803450
0692 00 65000A6C          LDX  L1 FEEDS      SET UP 2501 XIO       3A803460
0694 00 6D0006EF          STX  L1 TEST1+8                          3A803470
                *                                                  3A803480
0696 00 65000A85          LDX  L1 K100       SET UP 2501 CARD CNT  3A803490
0698 00 6D0006FE          STX  L1 NUMBR+1                          3A803500
069A 00 6D000723          STX  L1 NUMCK+1                          3A803510
069C 00 6D0007A9          STX  L1 FINSH+1                          3A803520
                *                                                  3A803530
069E 00 65000912          LDX  L1 WAITA      SET UP 2501 TEST VEC  3A803540
06A0 00 6D0007AB          STX  L1 FINSH+3                          3A803550
                *                                                  3A803560
                ************************************************ 3A803570
                *                                              * 3A803580
                *                  WAIT 7                      * 3A803590
                *                                              * 3A803600
                * 2501 WAS FOUND READY AND WILL BE THE         * 3A803610
                * DEVICE USED IN THE TEST.                     * 3A803620
                * IF SOME OTHER DEVICE IS DESIRED, MAKE THAT   * 3A803630
                * DEVICE READY AND MAKE NEW DEVICE SELECTION   * 3A803640
                * VIA THE CONSOLE ENTRY SWITCHES.              * 3A803650
                *                                              * 3A803660
                ************************************************ 3A803670
06A2 0  3007              WAIT    7          2501 SELECTED         3A803680
06A3 00 0C000A66          XIO  L  BITSW      READ BIT SWITCHES     3A803690
06A5 00 C4000A77          LD   L  BITS1      LOAD BIT SWITCHES     3A803700
06A7 0  180C              SRA     12                               3A803710
06A8 00 94000A78          S    L  BITS2      LAST DEVICE SELECTED  3A803720
06AA 00 4C18053E          BSC  L  CKLOP,+-   CHK FOR LEVEL LOOP    3A803730
06AC 00 4C000528          BSC  L  WHICH      NEW DEVICE SELECTED   3A803740
                *                                                  3A803750
06AE 0  6300      CLRIX   LDX     3 0                              3A803760
06AF 0  6200              LDX     2 0                              3A803770
06B0 0  6100              LDX     1 0                              3A803780
06B1 00 65000770          LDX  L1 VEC04                            3A803790
06B3 00 6D00000C          STX  L1 /000C                            3A803800
06B5 00 C4000727          LD   L  NUMCK+5    RESTORE LOOP CHK VEC  3A803810
06B7 00 D400073F          STO  L  MOD13+6                          3A803820
06B9 00 D400074F          STO  L  MOD14+6                          3A803830
06BB 00 D400075F          STO  L  MOD15+6                          3A803840
06BD 00 D400076F          STO  L  MOD16+6                          3A803850
06BF 00 D40007C6          STO  L  MOD17+6                          3A803860
06C1 00 D40007E6          STO  L  MOD18+6                          3A803870
06C3 00 D40007F2          STO  L  MOD19+6                          3A803880
06C5 00 D40007FE          STO  L  MOD1A+6                          3A803890
06C7 00 65003013          LDX  L1 /3013                            3A803900
06C9 00 6D000739          STX  L1 MOD13      RESTORE WAIT 13       3A803910
06CB 00 65003014          LDX  L1 /3014                            3A803920
06CD 00 6D000749          STX  L1 MOD14      RESTORE WAIT 14       3A803930
06CF 00 65003015          LDX  L1 /3015                            3A803940
06D1 00 6D000759          STX  L1 MOD15      RESTORE WAIT 15       3A803950
06D3 00 65003016          LDX  L1 /3016                            3A803960
06D5 00 6D000769          STX  L1 MOD16      RESTORE WAIT 16       3A803970
06D7 00 65003017          LDX  L1 /3017                            3A803980
06D9 00 6D0007C0          STX  L1 MOD17      RESTORE WAIT 17       3A803990
                *                                                  3A804000
06DB 00 0C000A58  BUSY    XIO  L  SENSE      SENSE DSW             3A804010
06DD 0  1801              SRA     1          SET UP TO CHK BUSY    3A804020
06DE 00 4C0406DB          BSC  L  BUSY,E     CHECK FOR BUSY        3A804030
06E0 00 0C000A66          XIO  L  BITSW      SENSE BIT SWITCHES    3A804040
06E2 00 C4000A77          LD   L  BITS1      LOAD BIT SWITCHES     3A804050
06E4 0  180C              SRA     12         CHK FOR WAIT 1 OPT    3A804060
06E5 00 4C040771          BSC  L  VEC04+1,E  SET UP FOR RESTORE    3A804070
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                     *                                                    3A804080
06E7 00 67800A7D     TEST1 LDX  I3 DELAY     500 MSEC DELAY              3A804090
06E9 00 0C000A58           XIO  L  SENSE     SENSE FOR READY             3A804100
06EB 0  1000               NOP                                           3A804110
06EC 00 4C0407FF           BSC  L  DSWCK,E   CHECK FOR READY             3A804120
06EE 00 0C000A6A           XIO  L  FEED      FEED                        3A804130
                     *                                                    3A804140
                     *                      **********************        3A804150
                     *                      *     WAIT 11        *        3A804160
                     *                      * NO INTERRUPTS      *        3A804170
                     *                      * WERE GENERATED.    *        3A804180
                     *                      * TO CKECK OUT RUN   *        3A804190
                     *                      * TRIGGER, PUSH      *        3A804200
                     *                      * START              *        3A804210
                     *                      **********************        3A804220
06F0 0  3011         RUNCK WAIT     /11     NO INTERRUPTS               3A804230
06F1 0  701A         MOD11 MDX      CKRUN   SET UP RUN TRIG CHK          3A804240
06F2 0  73FF               MDX   3 -1       DECREMENT DELAY BY 1        3A804250
06F3 0  70FE               MDX     MOD11+1                               3A804260
06F4 0  6100               LDX   1 0                                     3A804270
06F5 00 6D000A7A           STX  L1 GDCNT     RESET GOOD PASS CNTR        3A804280
06F7 00 C4000A7C           LD   L  LPCNT     LOAD LOOP COUNT             3A804290
06F9 00 84000A7F           A    L  ADD01     ADD 1 TO LOOP COUNT         3A804300
06FB 00 D4000A7C           STO  L  LPCNT     STORE LOOP COUNT            3A804310
06FD 00 94000A85     NUMBR S    L  K100      CHK FOR STOP LOOP           3A804320
06FF 00 4C100817           BSC  L  WAIT2,-                               3A804330
                     *                                                    3A804340
                     *                      **********************        3A804350
                     *                      *     WAIT 12        *        3A804360
                     *                      * NO INTERRUPTS      *        3A804370
                     *                      * WERE GENERATED.    *        3A804380
                     *                      * SETTING OF RUN     *        3A804390
                     *                      * TRIGGER APPEARS    *        3A804400
                     *                      * NOT TO BE THE      *        3A804410
                     *                      * CAUSE OF THE       *        3A804420
                     *                      * FAILURE.           *        3A804430
                     *                      * TO GO INTO SCOPE   *        3A804440
                     *                      * LOOP, PUSH START.  *        3A804450
                     *                      **********************        3A804460
0701 0  3012         RUNDK WAIT     /12     NO INT-RUN TRIG CKED        3A804470
0702 00 65000770           LDX  L1 VEC04                                 3A804480
0704 00 6D00000C           STX  L1 /000C     SET UP LEVEL 4 VEC          3A804490
0706 00 65001000           LDX  L1 /1000     NOP                         3A804500
0708 0  69E7               STX   1 RUNCK     SET UP SCOPE LOOP           3A804510
0709 0  69E7               STX   1 MOD11                                 3A804520
070A 0  69F6               STX   1 RUNDK                                 3A804530
070B 0  7009               MDX     FDCYC     BRANCH TO SCOPE LOOP        3A804540
                     *                                                    3A804550
070C 00 65001000     CKRUN LDX  L1 /1000     SET UP RUN TRIG CHK         3A804560
070E 0  69E1               STX   1 RUNCK                                 3A804570
070F 0  69E1               STX   1 MOD11                                 3A804580
0710 00 650007C7           LDX  L1 CKDOK                                 3A804590
0712 00 6D00000C           STX  L1 /000C                                 3A804600
0714 0  70C6               MDX     BUSY      CHECK RUN TRIGGER           3A804610
                     *                                                    3A804620
0715 0  6100         FDCYC LDX   1 0                                     3A804630
0716 00 6D000A7A           STX  L1 GDCNT     RESET GOOD PASS CNTR        3A804640
0718 00 4C000998           BSC  L  CNTCK     CHK COUNT OPTION            3A804650
                     *                                                    3A804660
071A 0  73FF         ERROR MDX   3 -1                                    3A804670
071B 0  70FE               MDX     ERROR     STEP DOWN DELAY             3A804680
071C 00 C4000A7C           LD   L  LPCNT     LOAD LOOP COUNT             3A804690
071E 00 84000A81           A    L  K001      ADD 1 TO LOOP CNT           3A804700
0720 00 D4000A7C           STO  L  LPCNT     STORE LOOP CNT              3A804710
0722 00 94000A85     NUMCK S    L  K100      CHECK FOR STOP LOOP         3A804720
0724 00 4C100728           BSC  L  WAITG,-   CHECK FOR WAIT 2            3A804730
0726 00 4C000715           BSC  L  FDCYC     FEED AGAIN                  3A804740
                     *                                                    3A804750
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                     ************************************************     3A804760
                     *                                              *     3A804770
                     *                  WAIT 2                      *     3A804780
                     *                                              *     3A804790
                     * NORMAL WAIT AFTER DESIRED NUMBER OF LOOPS    *     3A804800
                     * PASSES HAVE BEEN MADE. PUSH START TO MAKE    *     3A804810
                     * ANOTHER LOOP CYCLE.                          *     3A804820
                     ************************************************     3A804830
                     *                                                    3A804840
0728 0  3002         WAITG WAIT     2        STOP SCOPE LOOP             3A804850
0729 00 0C000A58           XIO  L  SENSE                                 3A804860
0728 0  6100               LDX   1 0                                     3A804870
072C 00 6D000A7C           STX  L1 LPCNT     RESET LOOP COUNT            3A804880
072E 00 4C000715           BSC  L  FDCYC                                 3A804890
                     *                                                    3A804900
0730 0  0000         LOOPO DC       0        **********************      3A804910
0731 00 0C000A5A           XIO  L  SENPT     * LEVEL 0 AUTO       *      3A804920
0733 0  7001               MDX     VEC00+1   * LEVEL RESET LOOP   *      3A804930
                     *                      **********************      3A804940
0734 0  0000         VEC00 DC       0        * LEVEL 0 RESET      *      3A804950
0735 00 0C000A58           XIO  L  SENSE     * SCOPE LOOP         *      3A804960
0737 00 4C400739           BOSC L  MOD13     **********************      3A804970
                     *                                                    3A804980
                     *                      **********************      3A804990
                     *                      * INTERRUPT 0 LEVEL  *      3A805000
                     *                      *     WAIT 30        *      3A805010
                     *                      * RESET DURING AUTO  *      3A805020
                     *                      * SCOPE LOOP.        *      3A805030
                     *                      * PUSH START TO GO   *      3A805040
                     *                      * TO WAIT 1.         *      3A805050
                     *                      **********************      3A805060
                     *                      **********************      3A805070
                     *                      *     WAIT 13        *      3A805080
0739 0  3030         MOD13 WAIT     /30      * DROPPED ADDR BIT   *      3A805090
                     *                      * 13. PUSH START     *      3A805100
                     *                      * FOR SCOPE LOOP     *      3A805110
                     *                      **********************      3A805120
073A 00 65800A90           LDX  I1 MOFYB     MDX ERROR                   3A805130
073C 00 6D000739           STX  L1 MOD13                                 3A805140
073E 00 4C000502           BSC  L  MAPIT                                 3A805150
                     *                      **********************      3A805160
0740 0  0000         LOOP1 DC       0        *                    *      3A805170
0741 00 0C000A62           XIO  L  PRINT     * LEVEL 1 AUTO       *      3A805180
0743 0  7001               MDX     VEC01+1   * LEVEL RESET LOOP   *      3A805190
                     *                      **********************      3A805200
0744 0  0000         VEC01 DC       0        * LEVEL 1 RESET      *      3A805210
0745 00 0C000A58           XIO  L  SENSE     * SCOPE LOOP         *      3A805220
0747 00 4C400749           BOSC L  MOD14     **********************      3A805230
                     *                                                    3A805240
                     *                      **********************      3A805250
                     *                      *     WAIT 31        *      3A805260
                     *                      * INTERRUPT 1 LEVEL  *      3A805270
                     *                      * RESET DURING AUTO  *      3A805280
                     *                      * SCOPE LOOP.        *      3A805290
                     *                      * PUSH START TO GO   *      3A805300
                     *                      * TO WAIT 1.         *      3A805310
                     *                      **********************      3A805320
                     *                      **********************      3A805330
                     *                      *     WAIT 14        *      3A805340
0749 0  3031         MOD14 WAIT     /31      * INTERRUPT CAUSED   *      3A805350
                     *                      * A LEVEL 1 ADDR TO  *      3A805360
                     *                      * BE GENERATED.      *      3A805370
                     *                      * PUSH START FOR     *      3A805380
                     *                      * SCOPE LOOP.        *      3A805390
                     *                      **********************      3A805400
074A 00 65800A91           LDX  I1 MOFYC     MDX ERROR                   3A805410
074C 00 6D000749           STX  L1 MOD14                                 3A805420
074E 00 4C000502           BSC  L  MAPIT                                 3A805430
```

INTERRUPT TEST

```
                  *                              3A805440
                  *          ******************** 3A805450
                  *          *      WAIT 32     * 3A805460
                  *          * INTERRUPT 2 LEVEL* 3A805470
                  *          * RESET DURING AUTO* 3A805480
                  *          * SCOPE LOOP.      * 3A805490
                  *          * PUSH START TO GO * 3A805500
                  *          * TO WAIT 1.       * 3A805510
                  *          ******************** 3A805520
0750 0  0000      LOOP2 DC       0        *                  * 3A805530
0751 00 0C000A5E        XIO   L  DISK     * LEVEL 2 AUTO     * 3A805540
0753 0  7001            MDX      VEC02+1  * LEVEL RESET LOOP * 3A805550
                  *                       ******************** 3A805560
0754 0  0000      VEC02 DC       0        * LEVEL 2 RESET    * 3A805570
0755 00 0C000A58        XIO   L  SENSE    * SCOPE LOOP       * 3A805580
0757 00 4C400759        BOSC  L  MOD15    ******************** 3A805590
                  *                                            3A805600
                  *                       ******************** 3A805610
                  *                       *      WAIT 15     * 3A805620
0759 0  3032      MOD15 WAIT     /32      * INTERRUPT CAUSED * 3A805630
                  *                       * A LEVEL 2 ADDR TO* 3A805640
                  *                       * BE GENERATED.    * 3A805650
                  *                       * PUSH START FOR   * 3A805660
                  *                       * SCOPE LOOP.      * 3A805670
                  *                       ******************** 3A805680
075A 00 65800A92        LDX   I1 MOFYD    MDX ERROR            3A805690
075C 00 6D000759        STX   L1 MOD15                         3A805700
075E 00 4C000502        BSC   L  MAPIT                         3A805710
                  *                                            3A805720
                  *                       ******************** 3A805730
                  *                       *      WAIT 33     * 3A805740
                  *                       * INTERRUPT 3 LEVEL* 3A805750
                  *                       * RESET DURING AUTO* 3A805760
                  *                       * SCOPE LOOP.      * 3A805770
                  *                       * PUSH START TO GO * 3A805780
                  *                       * TO WAIT 1.       * 3A805790
                  *                       ******************** 3A805800
0760 0  0000      LOOP3 DC       0        *                  * 3A805810
0761 00 0C000A60        XIO   L  PLOT     * LEVEL 3 AUTO     * 3A805820
0763 0  7001            MDX      VEC03+1  * LEVEL RESET LOOP * 3A805830
                  *                       ******************** 3A805840
0764 0  0000      VEC03 DC       0        * LEVEL 3 RESET    * 3A805850
0765 00 0C000A58        XIO   L  SENSE    * SCOPE LOOP       * 3A805860
0767 00 4C400769        BOSC  L  MOD16    ******************** 3A805870
                  *                                            3A805880
                  *                       ******************** 3A805890
                  *                       *      WAIT 16     * 3A805900
0769 0  3033      MOD16 WAIT     /33      * INTERRUPT CAUSED * 3A805910
                  *                       * A LEVEL 3 ADDR TO* 3A805920
                  *                       * BE GENERATED.    * 3A805930
                  *                       * PUSH START FOR   * 3A805940
                  *                       * SCOPE LOOP.      * 3A805950
                  *                       ******************** 3A805960
076A 00 65800A93        LDX   I1 MOFYE    MDX ERROR            3A805970
076C 00 6D000769        STX   L1 MOD16                         3A805980
076E 00 4C000502        BSC   L  MAPIT                         3A805990
                  *                                            3A806000
0770 0  0000      VEC04 DC       0                             3A806010
0771 00 0C000A58        XIO   L  SENSE                         3A806020
0773 0  6100            LDX    1 0                             3A806030
0774 00 6D000A7C        STX   L1 LPCNT    RESET LOOP COUNT     3A806040
0776 00 65800A98        LDX   I1 MOFYL    MDX CKRUN            3A806050
0778 00 6D0006F1        STX   L1 MOD11    RESTORE MOD11        3A806060
077A 00 65003011        LDX   L1 /3011                         3A806070
077C 00 6D0006F0        STX   L1 RUNCK    RESTORE WAIT 11      3A806080
077E 00 65003012        LDX   L1 /3012                         3A806090
0780 00 6D000701        STX   L1 RUNOK    RESTORE WAIT 12      3A806100
0782 00 65003013        LDX   L1 /3013                         3A806110
```


INTERRUPT TEST

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0784 00 6D000739        STX   L1 MOD13    RESTORE WAIT 13      3A806120
0786 00 65003014        LDX   L1 /3014                         3A806130
0788 00 6D000749        STX   L1 MOD14    RESTORE WAIT 14      3A806140
078A 00 65003015        LDX   L1 /3015                         3A806150
078C 00 6D000759        STX   L1 MOD15    RESTORE WAIT 15      3A806160
078E 00 65003016        LDX   L1 /3016                         3A806170
0790 00 6D000769        STX   L1 MOD16    RESTORE WAIT 16      3A806180
0792 00 65003017        LDX   L1 /3017                         3A806190
0794 00 6D0007C0        STX   L1 MOD17    RESTORE WAIT 17      3A806200
0796 00 65003018        LDX   L1 /3018                         3A806210
0798 00 6D0007E0        STX   L1 MOD18    RESTORE WAIT 18      3A806220
079A 00 65003019        LDX   L1 /3019                         3A806230
079C 00 6D0007EC        STX   L1 MOD19    RESTORE WAIT 19      3A806240
079E 00 6500301A        LDX   L1 /301A                         3A806250
07A0 00 6D0007F8        STX   L1 MOD1A    RESTORE WAIT 1A      3A806260
07A2 00 04000A7A        LD    L  GDCNT    RESET GOOD COUNT     3A806270
07A4 00 84000A81        A     L  K001     ADD 1 TO GOOD COUNT  3A806280
07A6 00 D4000A7A        STO   L  GDCNT    STORE GOOD COUNT     3A806290
07A8 00 94000A82  FINSH S     L  K010     CHK FOR END TEST     3A806300
07AA 00 4C500829        BOSC  L  SETUP,-  TEST 1 COMPLETE      3A806310
07AC 00 0C000A66        XIO   L  BITSW    SENSE BIT SWITCHES   3A806320
07AE 00 C4000A77        LD    L  BITS1    LOAD BIT SWITCHES    3A806330
07B0 0  180C            SRA      12       CHK FOR WAIT 1 OPT   3A806340
07B1 00 4C440913        BOSC  L  WAITA+1,E RESTORE/GO TO WAIT 1 3A806350
07B3 00 4C4006AE        BOSC  L  CLRIX                         3A806360
                  *                                            3A806370
07B5 00 4C00071A  GAPIT BSC   L  ERROR    ALLOW LOOP           3A806380
                  *                                            3A806390
07B7 0  0000      LOOP5 DC       0        ******************** 3A806400
07B8 00 0C000A68        XIO   L  STOP     * LEVEL 5 AUTO     * 3A806410
07BA 0  7001            MDX      VEC05+1  * LEVEL RESET LOOP * 3A806420
                  *                                            3A806430
07BB 0  0000      VEC05 DC       0                             3A806440
07BC 00 0C000A58        XIO   L  SENSE      LEVEL 5 RESET      3A806450
07BE 00 4C4007C0        BOSC  L  MOD17                         3A806460
                  *                       ******************** 3A806470
                  *                       *      WAIT 35     * 3A806480
                  *                       * INTERRUPT 5 LEVEL* 3A806490
                  *                       * RESET DURING AUTO* 3A806500
                  *                       * SCOPE LOOP.      * 3A806510
                  *                       * PUSH START TO GO * 3A806520
                  *                       * TO WAIT 1.       * 3A806530
                  *                       ******************** 3A806540
                  *                       ******************** 3A806550
                  *                       *      WAIT 17     * 3A806560
07C0 0  3035      MOD17 WAIT     /35      * PICKED ADDR BIT  * 3A806570
                  *                       * 15. PUSH START   * 3A806580
                  *                       * FOR SCOPE LOOP   * 3A806590
                  *                       ******************** 3A806600
07C1 00 65800A94        LDX   I1 MOFYF    MDX ERROR            3A806610
07C3 00 6D0007C0        STX   L1 MOD17                         3A806620
07C5 00 4C000502        BSC   L  MAPIT                         3A806630
                  *                                            3A806640
07C7 0  0000      CKDOK DC       0                             3A806650
07C8 00 0C000A58        XIO   L  SENSE                         3A806660
07CA 00 4C4007CC        BOSC  L  WAITC                         3A806670
                  *                       ******************** 3A806680
07CC 0  301C      WAITC WAIT     /1C      *      WAIT 1C     * 3A806690
                  *                       * RUN TRIGGER WILL * 3A806700
                  *                       * NOT SET DURING A * 3A806710
                  *                       * WAIT OPERATION   * 3A806720
                  *                       ******************** 3A806730
07CD 00 65003011        LDX   L1 /3011    RESTORE WAIT OP      3A806740
07CF 00 6D0006F0        STX   L1 RUNCK                         3A806750
07D1 00 65800A8F        LDX   I1 MOFYA    MDX BUSY             3A806760
07D3 00 6D0006F1        STX   L1 MOD11    ALLOW ERROR TRAP     3A806770
07D5 00 65000770        LDX   L1 VEC04    RESTORE LEVEL 4      3A806780
07D7 00 6D00000C        STX   L1 /000C                         3A806790
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07D9 00 4C4006DB          BOSC L  BUSY       ERROR TRAP                    3A806800
                          *                                                3A806810
07DB 0  0000     BAD12    DC      0                                        3A806820
07DC 00 0C000A58          XIO  L  SENSE      ********************          3A806830
07DE 00 4C4007E0          BOSC L  MOD18      *     WAIT 18      *          3A806840
07E0 0  3018     MOD18    WAIT    /18        * DROPPED ADDR BIT *          3A806850
                          *                   * 12. PUSH START   *          3A806860
                          *                   * FOR SCOPE LOOP   *          3A806870
                          *                   ********************          3A806880
07E1 00 65800A95          LDX  I1 MOFYG      MDX ERROR                     3A806890
07E3 00 6D0007E0          STX  L1 MOD18                                    3A806900
07E5 00 4C000715          BSC  L  FDCYC      SCOPE LOOP                    3A806910
                          *                                                3A806920
07E7 0  0000     BAD14    DC      0                                        3A806930
07E8 00 0C000A58          XIO  L  SENSE      ********************          3A806940
07EA 00 4C4007EC          BOSC L  MOD19      *     WAIT 19      *          3A806950
07EC 0  3019     MOD19    WAIT    /19        * PICKED ADDR BIT  *          3A806960
                          *                   * 14. PUSH START   *          3A806970
                          *                   * FOR SCOPE LOOP   *          3A806980
                          *                   ********************          3A806990
07ED 00 65800A96          LDX  I1 MOFYH      MDX ERROR                     3A807000
07EF 00 6D0007EC          STX  L1 MOD19                                    3A807010
07F1 00 4C000715          BSC  L  FDCYC      SCOPE LOOP                    3A807020
                          *                                                3A807030
07F3 0  0000     NOADR    DC      0                                        3A807040
07F4 00 0C000A58          XIO  L  SENSE      ********************          3A807050
07F6 00 4C4007F8          BOSC L  MOD1A      *     WAIT 1A      *          3A807060
07F8 0  301A     MOD1A    WAIT    /1A        * NO ADDR TRANSFER *          3A807070
                          *                   * PUSH START FOR   *          3A807080
                          *                   * SCOPE LOOP.      *          3A807090
                          *                   ********************          3A807100
07F9 00 65800A97          LDX  I1 MOFYJ      MDX ERROR                     3A807110
07FB 00 6D0007F8          STX  L1 MOD1A                                    3A807120
07FD 00 4C000715          BSC  L  FDCYC      SCOPE LOOP                    3A807130
                          *                                                3A807140
                          *                                                3A807150
                          ************************************************3A807160
                          * OP/CODE 0, WAIT 0.-----NO READOUT OF BSI  *    3A807170
                          * OR INTERRUPT ADDRESS.                    *     3A807180
                          ************************************************3A807190
                          *                                                3A807200
                          *                                                3A807210
07FF 00 D4000A7E DSWCK    STO  L  DSW1       STORE DSW                     3A807220
0801 00 0C000A58          XIO  L  SENSE      SENSE FOR READY               3A807230
0803 0  1000              NOP                                              3A807240
0804 00 94000A7E          S    L  DSW1       SUBTRACT LAST DSW             3A807250
0806 00 4C18080A          BSC  L  DSWCK+11,+-                              3A807260
0808 00 4C0006E9          BSC  L  TEST1+2    DSW CHANGED                   3A807270
080A 00 0C000A58          XIO  L  SENSE      CHECK FOR READY               3A807280
080C 0  1000              NOP                                              3A807290
080D 0  6100              LDX   1 0                                        3A807300
080E 00 6D000A7E          STX  L1 DSW1       RESET STORED DSW              3A807310
0810 00 4C040814          BSC  L  WAIT3,E    NOT READY                     3A807320
0812 00 4C0006EE          BSC  L  TEST1+7    READY                         3A807330
0814 0  3003     WAIT3    WAIT    3          ********************          3A807340
                          *                   *     WAIT 3       *          3A807350
                          *                   * READER NOT READY *          3A807360
                          *                   ********************          3A807370
0815 00 4C0006E9          BSC  L  TEST1+2    READER READY                  3A807380
                          *                                                3A807390
                          *                   ********************          3A807400
                          *                   *     WAIT 2       *          3A807410
                          *                   * DESIRED NUMBER OF*          3A807420
                          *                   * LOOP PASSES,WHILE*          3A807430
                          *                   * IN SCOPE LOOP.   *          3A807440
                          *                   * PUSH START TO    *          3A807450
                          *                   * ANOTHER SCOPE    *          3A807460
                          *                   * LOOP PASS.       *          3A807470
```



```
                          *                   ********************          3A807480
0817 0  3002     WAIT2    WAIT    2          STOP SCOPE LOOP               3A807490
0818 0  6100              LDX   1 0                                        3A807500
0819 00 6D000A7C          STX  L1 LPCNT      RESET LOOP COUNT              3A807510
081B 00 4C000715          BSC  L  FDCYC      CONTINUE TEST                 3A807520
                          *                                                3A807530
                          *                   ********************          3A807540
081D 0  0000     LOOP4    DC      0          * LEVEL 4 AUTO     *          3A807550
081E 00 0C000A58          XIO  L  SENSE      * LEVEL RESET LOOP *          3A807560
0820 00 0C000A64          XIO  L  CONSL      *                  *          3A807570
0822 00 0C000A5A          XIO  L  SENPT      *                  *          3A807580
0824 00 4C400826          BOSC L  MOD20      ********************          3A807590
                          *                   *     WAIT 34      *          3A807600
                          *                   * INTERRUPT 4 LEVEL*          3A807610
                          *                   * RESET DURING AUTO*          3A807620
                          *                   * SCOPE LOOP.      *          3A807630
                          *                   * PUSH START TO GO *          3A807640
                          *                   * TO WAIT 1.       *          3A807650
                          *                   ********************          3A807660
0826 0  3034     MOD20    WAIT    /34                                      3A807670
0827 00 4C000502          BSC  L  MAPIT                                    3A807680
                          *                                                3A807690
                          *                                                3A807700
                          ************************************************3A807710
                          * INTERRUPT VECTOR SETUP.                  *     3A807720
                          ************************************************3A807730
0829 0  6100     SETUP    LDX   1 0                                        3A807740
082A 00 6D000A7A          STX  L1 GDCNT      RESET GOOD PASS CNT           3A807750
082C 00 65000897          LDX  L1 INT00                                    3A807760
082E 00 6D000008          STX  L1 /0008                                    3A807770
0830 00 6500092D          LDX  L1 INT01                                    3A807780
0832 00 6D000009          STX  L1 /0009                                    3A807790
0834 00 65000942          LDX  L1 INT02                                    3A807800
0836 00 6D00000A          STX  L1 /000A                                    3A807810
0838 00 65000957          LDX  L1 INT03                                    3A807820
083A 00 6D00000B          STX  L1 /000B                                    3A807830
083C 00 65000882          LDX  L1 INT04                                    3A807840
083E 00 6D00000C          STX  L1 /000C                                    3A807850
0840 00 6500096C          LDX  L1 INT05                                    3A807860
0842 00 6D00000D          STX  L1 /000D                                    3A807870
0844 00 65000981          LDX  L1 ADR12                                    3A807880
0846 00 6D000000          STX  L1 /0000                                    3A807890
                          *                                                3A807900
0848 0  6100     RESET    LDX   1 0                                        3A807910
0849 0  6200              LDX   2 0                                        3A807920
084A 0  6300              LDX   3 0                                        3A807930
                          *                                                3A807940
084B 00 0C000A58 BUZY     XIO  L  SENSE      SENSE DSW                     3A807950
084D 0  1801              SRA     1          SET UP TO CHK BIT 14          3A807960
084E 00 4C04084B          BSC  L  BUZY,E     CHECK FOR BUSY                3A807970
0850 00 0C000A66          XIO  L  BITSW      SENSE BIT SWITCHES            3A807980
0852 00 C4000A77          LD   L  BITS1      LOAD BIT SWITCHES             3A807990
0854 0  180C              SRA     12         CHK FOR WAIT 1 OPT            3A808000
0855 00 4C0408DA          BSC  L  CNTOK,E    SET UP FOR RESTORE            3A808010
                          *                                                3A808020
0857 00 67800A7D START    LDX  I3 DELAY      SET UP DELAY                  3A808030
0859 00 0C000A58          XIO  L  SENSE      SENSE FOR READY               3A808040
085B 00 4C04087F          BSC  L  CKRDY,E    CHECH FOR READY               3A808050
085D 00 0C000A70          XIO  L  RESTR                                    3A808060
                          *                                                3A808070
085F 0  73FF     LESS1    MDX     3 -1                                     3A808080
0860 0  70FE              MDX     LESS1                                    3A808090
                          ************************************************3A808100
                          *                                          *     3A808110
                          *                WAIT 21                   *     3A808120
                          *                                          *     3A808130
                          * NO INTERRUPTS WERE GENERATED WITHIN 500  *     3A808140
                          * MSEC. AFTER A READS WAS GIVEN. THIS SHOULD*    3A808150
```

INTERRUPT TEST

```
                        * HAVE BEEN ENOUGH TIME TO RECEIVE 80 COLUMN*  3A808160
                        * INTERRUPTS AND AN END OP INTERRUPT.       *  3A808170
                        * PUSH START FOR SCOPE LOOP.                *  3A808180
                        **********************************************  3A808190
                        *                                              3A808200
0861 0  3021            MOD21 WAIT    /21         NO LEV. 0 OR 4 INTRPT  3A808210
                        *                                              3A808220
                        **********************************************  3A808230
                        *                                           *  3A808240
                        *                SCOPE LOOP                 *  3A808250
                        *                                           *  3A808260
                        * TO USE SCOPE LOOP, PRESS START. THIS WILL *  3A808270
                        * FEED CARDS AT A 2 CARD/SEC RATE WITH      *  3A808280
                        * A HALT AFTER 100 CARDS.                   *  3A808290
                        * IF AN INTERRUPT IS GENERATED DURING THIS  *  3A808300
                        * SCOPE LOOP, A WAIT WILL IDENTIFY IT.      *  3A808310
                        * MAKE SURE THERE IS A SUFFICIENT AMOUNT OF *  3A808320
                        * BLANK CARDS IN READER TO ALLOW FURTHER    *  3A808330
                        * CHECKING.                                 *  3A808340
                        **********************************************  3A808350
                        *                                              3A808360
0862 0  6100            CARDS LDX   1 0                               3A808370
0863 00 6D000A7A              STX   L1 GDCNT      RESET GOOD PASS CNTR  3A808380
0865 00 65001000              LDX   L1 /1000      NOP                   3A808390
0867 00 6D000861              STX   L1 MOD21      ALLOW LOOP            3A808400
0869 00 4C0009FD              BSC   L  CNTIT      CHK COUNT OPTION      3A808410
086B 00 C4000A7C        RETRN LD    L  LPCNT      LOOP CARD COUNTER     3A808420
086D 00 84000A81              A     L  K001       ADD 1                 3A808430
086F 00 D4000A7C              STO   L  LPCNT                            3A808440
0871 00 94000A85        TOTAL S     L  K100       SUBTRACT 100          3A808450
0873 00 4C100876              BSC   L  CHECK,-    100 CARDS FED         3A808460
0875 0  70D5                  MDX      BUZY       CHECK FOR BUSY        3A808470
                        *                                              3A808480
0876 00 C4000A7B        CHECK LD    L  CLCNT      LOAD COLUMN COUNT     3A808490
                        **********************************************  3A808500
                        *                                           *  3A808510
                        *                WAIT 2                     *  3A808520
                        *                                           *  3A808530
                        * NORMAL WAIT AFTER DESIRED NUMBER OF CARDS *  3A808540
                        * HAVE BEEN READ. PRESS START TO READ THE   *  3A808550
                        * NUMBER OF BLANK CARDS DESIRED             *  3A808560
                        **********************************************  3A808570
                        *                                              3A808580
0878 0  3002                  WAIT  2           100 CARDS FED         3A808590
                        *                                              3A808600
0879 0  6200                  LDX   2 0                                 3A808610
087A 00 6E000A7C              STX   L2 LPCNT      RESET LOOP COUNT      3A808620
087C 00 6E000A7B              STX   L2 CLCNT      RESET COLUMN COUNT    3A808630
087E 0  70CC                  MDX      BUZY       RESTART LOOP CHECK    3A808640
                        *                                              3A808650
087F 00 D4000A7E        CKRDY STO   L  DSW1       STORE DSW             3A808660
0881 00 0C000A58              XIO   L  SENSE      SENSE FOR READY       3A808670
0883 00 94000A7E              S     L  DSW1       SUBTRACT LAST DSW     3A808680
0885 00 4C180889              BSC   L  CKRDY+10,+-                      3A808690
0887 00 4C000859              BSC   L  START+2    DSW CHANGED           3A808700
0889 00 0C000A58              XIO   L  SENSE      RESET DSW             3A808710
088B 0  6100                  LDX   1 0                                 3A808720
088C 00 6D000A7E              STX   L1 DSW1       RESET STORED DSW      3A808730
088E 00 4C040892              BSC   L  NORDY,E    NOT READY             3A808740
0890 00 4C000850              BSC   L  START+6    READY                 3A808750
                        *                                              3A808760
                        *                         ********************  3A808770
                        *                         *      WAIT 3      *  3A808780
                        *                         * READER NOT READY *  3A808790
                        *                         ********************  3A808800
0892 0  3003            NORDY WAIT    3           READER NOT READY      3A808810
0893 00 0C000A58              XIO   L  SENSE      SENSE + RESET         3A808820
0895 00 4C000859              BSC   L  START+2    READER READY          3A808830
```


INTERRUPT TEST

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                        *                                              3A808840
0897 0  0000            INT00 DC    0                                 3A808850
0898 00 0C000A58              XIO   L  SENSE                          3A808860
089A 00 74010A7B              MDX   L  CLCNT,+1   ADD 1 TO COLUMN CNT  3A808870
089C 00 65000882              LDX   L1 INT04      RESTORE LEVEL 4 VEC.  3A808880
089E 00 6D00000C              STX   L1 /000C                          3A808890
08A0 00 668C0A9A              LDX   I2 MDFY3      MDX WAIT 22           3A808900
08A2 0  6ABE                  STX    2 MOD21      CHECK FOR LEVEL 4     3A808910
08A3 00 4C4008A5              BOSC  L  COLGO      RESET LEVEL 0         3A808920
                        *                                              3A808930
08A5 00 0C000A74        COLGO XIO   L  READ                           3A808940
08A7 00 4C00085F              BSC   L  LESS1                          3A808950
                        **********************************************  3A808960
                        *                                           *  3A808970
                        *                WAIT 22                    *  3A808980
                        *                                           *  3A808990
                        * AT LEAST 1 COLUMN INTERRUPT WAS GENERATED *  3A809000
                        * AND NO END OP GENERATED FOR LAST CARD.    *  3A809010
                        * THE NUMBER OF COLUMNS READ IS DISPLAYED   *  3A809020
                        * IN THE A REG.                             *  3A809030
                        * PUSH START FOR SCOPE LOOP.                *  3A809040
                        **********************************************  3A809050
08A9 0  3022            MOD22 WAIT    /22         NO LEVEL 4 RECIEVED   3A809060
                        **********************************************  3A809070
                        *                SCOPE LOOP                 *  3A809080
                        **********************************************  3A809090
                        *                                              3A809100
08AA 00 65000001              LDX   L1 /0001      NOP                   3A809110
08AC 00 6D0008A9              STX   L1 MOD22      ALLOW LOOP            3A809120
08AE 0  6100                  LDX   1 0           RESET COLUMN COUNT    3A809130
08AF 00 6D000A7B              STX   L1 CLCNT                            3A809140
08B1 0  70B0                  MDX      MOD21+1    BRANCH TO LOOP        3A809150
                        *                                              3A809160
08B2 0  0000            INT04 DC    0                                 3A809170
08B3 00 0C000A58              XIO   L  SENSE                          3A809180
08B5 00 74010A7A              MDX   L  GDCNT,+1   ADD 1 TO GOOD PASS   3A809190
08B7 00 65003021              LDX   L1 /3021                          3A809200
08B9 00 6D000861              STX   L1 MOD21      RESTORE WAIT 21       3A809210
08BB 00 65003022              LDX   L1 /3022                          3A809220
08BD 00 6D0008A9              STX   L1 MOD22      RESTORE WAIT 22       3A809230
08BF 00 C4000A7B              LD    L  CLCNT      LOAD COLUMN COUNT     3A809240
08C1 00 94000A84              S     L  K080       CHECK FOR 80 COLUMNS  3A809250
08C3 00 4C5808DA              BOSC  L  CNTOK,+-   CHECKED OK           3A809260
08C5 00 4C680921              BOSC  L  MOD24,Z+   BRANCH LESS THAN 80   3A809270
08C7 00 4C4008C9              BOSC  L  CLERR                          3A809280
08C9 00 C4000A7B        CLERR LD    L  CLCNT      LOAD COLUMN COUNT     3A809290
                        **********************************************  3A809300
                        *                WAIT 23                    *  3A809310
                        *                                           *  3A809320
                        * MORE THAN 80 COLUMN INTERRUPTS RECEIVED   *  3A809330
                        * WHEN END OP INTERRUPT WAS GENERATED.NUMBER*  3A809340
                        * OF COLUMN INTERRUPTS IS DISPLAYED IN A REG*  3A809350
                        * PUSH START FOR SCOPE LOOP.                *  3A809360
                        **********************************************  3A809370
08CB 0  3023            MOD23 WAIT    /23         MORE THAN 80 COLUMNS  3A809380
08CC 0  6100                  LDX   1 0           RESET COLUMN COUNT    3A809390
08CD 00 6D000A7B              STX   L1 CLCNT                            3A809400
08CF 00 668008AB              LDX   I2 MDFY4                            3A809410
08D1 00 6E0008CB              STX   L2 MOD23      ALLOW LOOP            3A809420
08D3 00 4C400862              BOSC  L  CARDS      BRANCH TO LOOP        3A809430
                        *                                              3A809440
08D5 0  6100            HOPIT LDX   1 0                               3A809450
08D6 00 6D000A7B              STX   L1 CLCNT      RESET COLUMN COUNT    3A809460
08D8 00 4C00085F              BSC   L  LESS1                          3A809470
                        *                                              3A809480
08DA 00 65003021        CNTOK LDX   L1 /3021                          3A809490
08DC 00 6D000861              STX   L1 MOD21      RESTORE WAIT 21       3A809500
08DE 00 65003022              LDX   L1 /3022                          3A809510
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08E0 00 6D0008A9          STX  L1 MOD22       RESTORE WAIT 22          3A809520
08E2 00 65003023          LDX  L1 /3023                                3A809530
08E4 00 6D0008CB          STX  L1 MOD23       RESTORE WAIT 23          3A809540
08E6 00 65003024          LDX  L1 /3024                                3A809550
08E8 00 6D000923          STX  L1 MOD24+2     RESTORE WAIT 24          3A809560
08EA 00 65003025          LDX  L1 /3025                                3A809570
08EC 00 6D000938          STX  L1 MOD25       RESTORE WAIT 25          3A809580
08EE 00 65003026          LDX  L1 /3026                                3A809590
08F0 00 6D00094D          STX  L1 MOD26       RESTORE WAIT 26          3A809600
08F2 00 65003027          LDX  L1 /3027                                3A809610
08F4 00 6D000962          STX  L1 MOD27       RESTORE WAIT 27          3A809620
08F6 00 65003028          LDX  L1 /3028                                3A809630
08F8 00 6D000977          STX  L1 MOD28       RESTORE WAIT 28          3A809640
08FA 00 65003029          LDX  L1 /3029                                3A809650
08FC 00 6D00098C          STX  L1 MOD29       RESTORE WAIT 29          3A809660
08FE 00 C4000A7A          LD   L  GDCNT       LOAD CARD COUNT          3A809670
0900 00 94000A82          S    L  K010        SUBTRACT 10              3A809680
0902 00 4C100912          BSC  L  WAITA,-     CHK NUMBER OF PASSES     3A809690
0904 0  6100              LDX   1 0                                    3A809700
0905 00 6D000A7B          STX  L1 CLCNT       RESET COLUMN COUNT       3A809710
0907 00 6D000A7C          STX  L1 LPCNT       RESET LOOP CARD CNT      3A809720
0909 00 0C000A66          XIO  L  BITSW       SENSE BIT SWITCHES       3A809730
090B 00 C4000A77          LD   L  BITS1       LOAD BIT SWITCHES        3A809740
090D 0  180C              SRA      12         CHK FOR WAIT 1 OPT       3A809750
090E 00 4C040913          BSC  L  WAITA+1,E   RESTORE/GO TO WAIT 1     3A809760
0910 00 4C00082C          BSC  L  SETUP+3     NOT 10 PASSES            3A809770
                     *                                               3A809780
                     *                       *********************   3A809790
                     *                       *      WAIT 4       *   3A809800
0912 0  3004         WAITA WAIT    4          * DEVICE TESTED,    *   3A809810
                     *                       * RAN SUCCESSFUL.   *   3A809820
                     ***********************************************   3A809830
                     *                                             *   3A809840
                     *                RERUN                        *   3A809850
                     *                                             *   3A809860
                     * TO RERUN PROGRAM PRESS START.               *   3A809870
                     *                                             *   3A809880
                     ***********************************************   3A809890
0913 0  6100              LDX   1 0                                    3A809900
0914 00 6D000A7B          STX  L1 CLCNT       RESET COLUMN COUNT       3A809910
0916 00 6D000A7A          STX  L1 GDCNT       RESET CARD COUNT         3A809920
0918 00 0C000A66          XIO  L  BITSW                                3A809930
091A 00 C4000A77          LD   L  BITS1                                3A809940
091C 0  180C              SRA      12                                  3A809950
091D 00 4C040502     MOD12 BSC  L  MAPIT,E                            3A809960
091F 00 4C0006AE          BSC  L  CLRIX       RERUN PROGRAM            3A809970
                     *                                               3A809980
0921 00 C4000A7B     MOD24 LD   L  CLCNT       LOAD COLUMN COUNT        3A809990
                     ***********************************************   3A810000
                     *                                             *   3A810010
                     *                WAIT 24                      *   3A810020
                     *                                             *   3A810030
                     * LESS THAN 80 COLUMN INTERRUPTS RECEIVED     *   3A810040
                     * WHEN END OP INTERRUPT WAS GENERATED.NUMBER  *   3A810050
                     * OF COLUMN INTERRUPTS IS DISPLAYED IN A REG  *   3A810060
                     * PUSH START FOR SCOPE LOOP.                  *   3A810070
                     ***********************************************   3A810080
0923 0  3024              WAIT   /24                                   3A810090
                     *                                               3A810100
0924 0  6100              LDX   1 0           RESET COLUMN COUNT       3A810110
0925 00 6D000A7B          STX  L1 CLCNT                                3A81C120
0927 00 66800A9C          LDX  I2 MDFY5                                3A810130
0929 00 6E000921          STX  L2 MOD24       ALLOW LOOP               3A810140
092B 00 4C000862          BSC  L  CARDS       BRANCH TO LOOP           3A810150
                     *                                               3A810160
092D 0  0000         INT01 DC       0         INTERRUPT 1              3A810170
092E 00 0C000A58          XIO  L  SENSE                                3A810180
0930 00 C4000A7B          LD   L  CLCNT       LOAD COLUMN COUNT        3A810190
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0932 00 6600092D          LDX  L2 INT01                                3A810200
0934 00 6F00000C          STX  L2 /000C                                3A810210
0936 00 4C400938          BOSC L  MOD25                                3A810220
                     ***********************************************   3A810230
                     *                                             *   3A810240
                     *                WAIT 25                      *   3A810250
                     *                                             *   3A810260
                     * INTERRUPT GENERATED,CAUSED A LEVEL 1        *   3A810270
                     * ADDRESS TO BE GENERATED.                    *   3A810280
                     * PUSH START FOR SCOPE LOOP.                  *   3A810290
                     ***********************************************   3A810300
0938 0  3025         MOD25 WAIT    /25         LEV 0 PICKED BIT 15      3A810310
                     *                                               3A810320
0939 0  6100              LDX   1 0           RESET COLUMN COUNT       3A810330
093A 00 6D000A7B          STX  L1 CLCNT                                3A810340
093C 00 66800A9D          LDX  I2 MDFY6       ALLOW LOOP               3A810350
093E 00 6E000938          STX  L2 MOD25       ALLOW LOOP               3A810360
0940 00 4C000862          BSC  L  CARDS       BRANCH TO LOOP           3A810370
                     *                                               3A810380
0942 0  0000         INT02 DC       0         INTERRUPT 2              3A810390
0943 00 0C000A58          XIO  L  SENSE                                3A810400
0945 00 C4000A7B          LD   L  CLCNT       LOAD COLUMN COUNT        3A810410
0947 00 66000942          LDX  L2 INT02                                3A810420
0949 00 6E00000C          STX  L2 /000C                                3A810430
094B 00 4C40094D          BOSC L  MOD26                                3A810440
                     ***********************************************   3A810450
                     *                                             *   3A810460
                     *                WAIT 26                      *   3A810470
                     *                                             *   3A810480
                     * INTERRUPT GENERATED,CAUSED A LEVEL 2        *   3A810490
                     * ADDRESS TO BE GENERATED.                    *   3A810500
                     * PUSH START FOR SCOPE LOOP.                  *   3A810510
                     ***********************************************   3A810520
094D 0  3026         MOD26 WAIT    /26         LEV 0 PICKED BIT 14      3A810530
                     *                                               3A810540
094E 0  6100              LDX   1 0           RESET COLUMN COUNT       3A810550
094F 00 6D000A7B          STX  L1 CLCNT                                3A810560
0951 00 66800A9E          LDX  I2 MDFY7       ALLOW LOOP               3A810570
0953 00 6E00094D          STX  L2 MOD26                                3A810580
0955 00 4C000862          BSC  L  CARDS       BRANCH TO LOOP           3A810590
                     *                                               3A810600
0957 0  0000         INT03 DC       0         INTERRUPT 3              3A810610
0958 00 0C000A58          XIO  L  SENSE                                3A810620
095A 00 C4000A7B          LD   L  CLCNT       LOAD COLUMN COUNT        3A810630
095C 00 66000957          LDX  L2 INT03                                3A810640
095E 00 6E00000C          STX  L2 /000C                                3A810650
0960 00 4C400962          BOSC L  MOD27                                3A810660
                     ***********************************************   3A810670
                     *                                             *   3A810680
                     *                WAIT 27                      *   3A810690
                     *                                             *   3A810700
                     * INTERRUPT GENERATED,CAUSED A LEVEL 3        *   3A810710
                     * ADDRESS TO BE GENERATED.                    *   3A810720
                     * PUSH START FOR SCOPE LOOP.                  *   3A810730
                     ***********************************************   3A810740
0962 0  3027         MOD27 WAIT    /27         LEV 0 PICKED 14+15       3A810750
                     *                                               3A810760
0963 0  6100              LDX   1 0           RESET COLUMN COUNT       3A810770
0964 00 6D000A7B          STX  L1 CLCNT                                3A810780
0966 00 66800A9F          LDX  I2 MDFY8       ALLOW LOOP               3A810790
0968 00 6E000962          STX  L2 MOD27                                3A810800
096A 00 4C000862          BSC  L  CARDS       BRANCH TO LOOP           3A810810
                     *                                               3A810820
096C 0  0000         INT05 DC       0         INTERRUPT 5              3A810830
096D 00 0C000A58          XIO  L  SENSE                                3A810840
096F 00 C4000A7B          LD   L  CLCNT       LOAD COLUMN COUNT        3A810850
0971 00 6600096C          LDX  L2 INT05                                3A810860
0973 00 6E00000C          STX  L2 /000C                                3A810870
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0975 00 4C400977          BOSC L  MOD28                                  3A810880
                          ***********************************************3A810890
                          *                                             *3A810900
                          *                WAIT 28                      *3A810910
                          *                                             *3A810920
                          * INTERRUPT GENERATED,CAUSED A LEVEL 5        *3A810930
                          * ADDRESS TO BE GENERATED.                    *3A810940
                          * PUSH START FOR SCOPE LOOP.                  *3A810950
                          ***********************************************3A810960
0977 0  3028              MOD28 WAIT    /28       LEV 0 PICKED 13+15     3A810970
                          *                                             3A810980
0978 0  6100                    LDX   1 0         RESET COLUMN COUNT     3A810990
0979 00 6D000A7B                STX   L1 CLCNT                           3A811000
097B C0 66800AA0                LDX   I2 MDFY9    ALLOW LOOP             3A811010
097D 00 6E000977                STX   L2 MOD28                           3A811020
097F 00 4C000862                BSC   L  CARDS     BRANCH TO LOOP         3A811030
                          *                                             3A811040
0981 0  0000              ADR12 DC      0                               3A811050
0982 00 0C000A58                XIO   L  SENSE                           3A811060
0984 00 C4000A7B                LD    L  CLCNT                           3A811070
0986 00 66000981                LDX   L2 ADR12                           3A811080
0988 00 6E00000C                STX   L2 /000C                           3A811090
098A 00 4C4009BC                BOSC  L  MOD29                           3A811100
                          ***********************************************3A811110
                          *                                             *3A811120
                          *                WAIT 29                      *3A811130
                          *                                             *3A811140
                          * BIT 12 WAS DROPPED WHEN INTERRUPT LEVEL     *3A811150
                          * 0 WAS GENERATED.                            *3A811160
                          * PUSH START FOR SCOPE LOOP.                  *3A811170
                          ***********************************************3A811180
                          *                                             3A811190
098C 0  3029              MOD29 WAIT    /29       INT 0 DROPPED BIT 12   3A811200
                          *                                             3A811210
098D 0  6100                    LDX   1 0         RESET COLUMN COUNT     3A811220
098E C0 6D000A7B                STX   L1 CLCNT                           3A811230
0990 00 66800A99                LDX   I2 MDFY2    ALLOW LOOP             3A811240
0992 00 6E00098C                STX   L2 MOD29                           3A811250
0994 00 4C000862                BSC   L  CARDS     BRANCH TO LOOP         3A811260
                          *                                             3A811270
0996 00 4C0008D5          JUMP  BSC   L  HOPIT                           3A811280
                          *                                             3A811290
0998 00 0C000A66          CNTCK XIO   L  BITSW      READ BIT SWITCHES      3A811300
099A 00 C4000A77                LD    L  BITS1     LOAD BIT SWITCHES      3A811310
099C 00 4C0409AF                BSC   L  KNT01,E   SELECT COUNT OF 10     3A811320
099E 0  1801                    SRA     1          CHK COUNT OF 50        3A811330
099F 00 4C0409B7                BSC   L  KNT02,E   SELECT COUNT OF 50     3A811340
09A1 0  1801                    SRA     1          CHK COUNT OF 250       3A811350
09A2 00 4C0409BF                BSC   L  KNT03,E   SELECT COUNT OF 250    3A811360
09A4 0  1801                    SRA     1          CHK COUNT OF 25000     3A811370
09A5 00 4C0409C7                BSC   L  KNT04,E   SEL COUNT OF 25000     3A811380
09A7 00 65000A85                LDX   L1 K100                            3A811390
09A9 00 6D00006FE               STX   L1 NUMBR+1   SET UP CNT OF 100      3A811400
09AB 00 D5000723                STO   L1 NUMCK+1   SET UP LOOP COUNT     3A811410
09AD 00 4C0009CF                BSC   L  CKOVR                           3A811420
                          *                                             3A811430
09AF 00 65000A82          KNT01 LDX   L1 K010                            3A811440
09B1 00 6D00006FE               STX   L1 NUMBR+1   SET UP CNT OF 10      3A811450
09B3 00 D5000723                STO   L1 NUMCK+1   SET UP LOOP COUNT     3A811460
09B5 00 4C0009CF                BSC   L  CKOVR                           3A811470
                          *                                             3A811480
09B7 00 65000A83          KNT02 LDX   L1 K050                            3A811490
09B9 00 6D00006FE               STX   L1 NUMBR+1   SET UP CNT OF 50      3A811500
09BB 00 D5000723                STO   L1 NUMCK+1   SET UP LOOP COUNT     3A811510
09BD 00 4C0009CF                BSC   L  CKOVR                           3A811520
                          *                                             3A811530
09BF 00 65000A86          KNT03 LDX   L1 K250                            3A811540
09C1 00 6D00006FE               STX   L1 NUMBR+1   SET UP CNT OF 250     3A811550
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09C3 00 D5000723                STO   L1 NUMCK+1   SET UP LOOP COUNT      3A811560
09C5 00 4C0009CF                BSC   L  CKOVR                           3A811570
                          *                                             3A811580
09C7 00 65000A87          KNT04 LDX   L1 KMAX                            3A811590
09C9 00 6D00006FE               STX   L1 NUMBR+1   SET UP CNT OF 25000    3A811600
09CB 00 D5000723                STO   L1 NUMCK+1   SET UP LOOP COUNT     3A811610
09CD 00 4C0009CF                BSC   L  CKOVR                           3A811620
                          *                                             3A811630
09CF 00 0C000A66          CKOVR XIO   L  BITSW      READ BIT SWITCHES      3A811640
09D1 00 C4000A77                LD    L  BITS1     LOAD BIT SWITCHES      3A811650
09D3 0  1804                    SRA     4          DELAY CHANGE           3A811660
09D4 00 4C0409E5                BSC   L  NODLY,E   NO DELAY SELECTE       3A811670
09D6 0  1801                    SRA     1          CHECK FOR DELAY        3A811680
09D7 00 4C0409EB                BSC   L  DLY01,E   SELECTED DELAY         3A811690
09D9 0  1801                    SRA     1          CHECK FOR DELAY        3A811700
09DA 00 4C0409F1                BSC   L  DLY02,E   SELECTED DELAY         3A811710
09DC 0  1801                    SRA     1          CHECK FOR DELAY        3A811720
09DD 00 4C0409F7                BSC   L  DLY03,E   SELECTED DELAY         3A811730
09DF 00 65000A7D                LDX   L1 DELAY     SET DELAY FOR .5 SEC   3A811740
09E1 00 6D00006E8               STX   L1 TEST1+1   SET UP DELAY           3A811750
09E3 00 4C0006DB                BSC   L  BUSY                            3A811760
                          *                                             3A811770
09E5 00 65000A80          NODLY LDX   L1 K000      LOAD ZERO              3A811780
09E7 00 6D00006E8               STX   L1 TEST1+1   SET UP NO DELAY        3A811790
09E9 00 4C0006DB                BSC   L  BUSY                            3A811800
                          *                                             3A811810
09EB 00 65000A88          DLY01 LDX   L1 TIME1                           3A811820
09ED 00 6D00006E8               STX   L1 TEST1+1   SET UP DELAY           3A811830
09EF 00 4C0006DB                BSC   L  BUSY                            3A811840
                          *                                             3A811850
09F1 00 65000A89          DLY02 LDX   L1 TIME2                           3A811860
09F3 00 6D00006E8               STX   L1 TEST1+1   SET UP DELAY           3A811870
09F5 00 4C0006DB                BSC   L  BUSY                            3A811880
                          *                                             3A811890
09F7 00 65000A8A          DLY03 LDX   L1 TIME3                           3A811900
09F9 00 6D00006E8               STX   L1 TEST1+1   SET UP DELAY           3A811910
09FB 00 4C0006DB                BSC   L  BUSY                            3A811920
                          *                                             3A811930
09FD 00 0C000A66          CNTIT XIO   L  BITSW      READ BIT SWITCHES      3A811940
09FF 00 C4000A77                LD    L  BITS1     LOAD BIT SWITCHES      3A811950
0A01 00 4C040A12                BSC   L  CNT01,E   SEL CARD CNT OF 10     3A811960
0A03 0  1801                    SRA     1          CHK CARD CNT OF 50     3A811970
0A04 00 4C040A18                BSC   L  CNT02,E   SEL CARD CNT OF 50     3A811980
0A06 0  1801                    SRA     1          CHK CARD CNT OF 250    3A811990
0A07 00 4C040A1E                BSC   L  CNT03,E   SEL CARD CNT OF 250    3A812000
0A09 0  1801                    SRA     1          CHK CARD CNT OF 25K    3A812010
0A0A 00 4C040A24                BSC   L  CNT04,E   SEL CARD CNT OF 25K    3A812020
0A0C 00 65000A82                LDX   L1 K010                            3A812030
0A0E 00 6D000872                STX   L1 TOTAL+1   SET UP CNT OF 10       3A812040
0A10 00 4C000A2A                BSC   L  ENDCK                           3A812050
                          *                                             3A812060
0A12 00 65000A82          CNT01 LDX   L1 K010                            3A812070
0A14 00 6D000872                STX   L1 TOTAL+1   SET UP CNT OF 10       3A812080
0A16 00 4C000A2A                BSC   L  ENDCK                           3A812090
                          *                                             3A812100
0A18 00 65000A83          CNT02 LDX   L1 K050                            3A812110
0A1A 00 6D000872                STX   L1 TOTAL+1   SET UP CNT OF 50       3A812120
0A1C 00 4C000A2A                BSC   L  ENDCK                           3A812130
                          *                                             3A812140
0A1E 00 65000A86          CNT03 LDX   L1 K250                            3A812150
0A20 00 6D000872                STX   L1 TOTAL+1   SET UP CNT OF 250      3A812160
0A22 00 4C000A2A                BSC   L  ENDCK                           3A812170
                          *                                             3A812180
0A24 00 65000A87          CNT04 LDX   L1 KMAX                            3A812190
0A26 00 6D000872                STX   L1 TOTAL+1   SET UP CNT OF 25000    3A812200
0A28 00 4C000A2A                BSC   L  ENDCK                           3A812210
                          *                                             3A812220
0A2A 00 0C000A66          ENDCK XIO   L  BITSW      READ BIT SWITCHES      3A812230
```

INTERRUPT TEST

```
0A2C 00 C4000A77        LD   L  BITS1      LOAD BIT SWITCHES          3A812240
0A2E 0  1804            SRA     4          DELAY CHANGE               3A812250
0A2F 00 4C040A40        BSC  L  DLYNO,E    NO DELAY SELECTED          3A812260
0A31 0  1801            SRA     1          CHECK FOR DELAY            3A812270
0A32 00 4C040A46        BSC  L  DLAY1,E    SELECTED DELAY             3A812280
0A34 0  1801            SRA     1          CHECK FOR DELAY            3A812290
0A35 00 4C040A4C        BSC  L  DLAY2,E    SELECTED DELAY             3A812300
0A37 0  1801            SRA     1          CHECK FOR DELAY            3A812310
0A38 00 4C040A52        BSC  L  DLAY3,E    SELECTED DELAY             3A812320
0A3A 00 65000A7D        LDX  L1 DELAY      SET DELAY FOR .5 SEC       3A812330
0A3C 00 6D000858        STX  L1 START+1    SET UP DELAY               3A812340
0A3E 00 4C000B6B        BSC  L  RETRN                                 3A812350
                        *                                             3A812360
0A40 00 65000A80  DLYNO LDX  L1 K000       LOAD ZERO                  3A812370
0A42 00 6D000858        STX  L1 START+1    SET UP NO DELAY            3A812380
0A44 00 4C000B6B        BSC  L  RETRN                                 3A812390
                        *                                             3A812400
0A46 00 65000A88  DLAY1 LDX  L1 TIME1                                 3A812410
0A48 00 6D000858        STX  L1 START+1    SET UP DELAY               3A812420
0A4A 00 4C000B6B        BSC  L  RETRN                                 3A812430
                        *                                             3A812440
0A4C 00 65000A89  DLAY2 LDX  L1 TIME2                                 3A812450
0A4E 00 6D000858        STX  L1 START+1    SET UP DELAY               3A812460
0A50 00 4C000B6B        BSC  L  RETRN                                 3A812470
                        *                                             3A812480
0A52 00 65000A8A  DLAY3 LDX  L1 TIME3                                 3A812490
0A54 00 6D000858        STX  L1 START+1    SET UP DELAY               3A812500
0A56 00 4C000B6B        BSC  L  RETRN                                 3A812510
                        *                                             3A812520
0A58    0000            BSS  E  0                                     3A812530
0A58 0  0000      SENSE DC      0          RESET DSW                  3A812540
0A59 0  1703            DC      /1703                                 3A812550
0A5A 0  0000      SENPT DC      0                                     3A812560
0A5B 0  1F01            DC      /1F01                                 3A812570
0A5C 0  0000      SEN25 DC      0          SENSE 2501 DSW             3A812580
0A5D 0  4F03            DC      /4F03                                 3A812590
0A5E 0  0000      DISK  DC      0                                     3A812600
0A5F 0  2701            DC      /2701                                 3A812610
0A60 0  0000      PLOT  DC      0                                     3A812620
0A61 0  2F01            DC      /2F01                                 3A812630
0A62 0  0000      PRINT DC      0                                     3A812640
0A63 0  3701            DC      /3701                                 3A812650
0A64 0  0000      CONSL DC      0                                     3A812660
0A65 0  0F01            DC      /0F01                                 3A812670
0A66 0  0A77      BITSW DC      BITS1                                 3A812680
0A67 0  3A00            DC      /3A00                                 3A812690
0A68 0  0000      STOP  DC      0                                     3A812700
0A69 0  3F01            DC      /3F01                                 3A812710
0A6A 0  0000      FEED  DC      0                                     3A812720
0A6B 0  1402            DC      /1402                                 3A812730
0A6C 0  0A6E      FEEDS DC      TABLE                                 3A812740
0A6D 0  4E00            DC      /4E00                                 3A812750
0A6E 0  0001      TABLE DC      1                                     3A812760
0A6F 0  0000            DC      0                                     3A812770
0A70 0  0000      RESTR DC      0                                     3A812780
0A71 0  1404            DC      /1404      READER START               3A812790
0A72 0  0000      CNTRL DC      0                                     3A812800
0A73 0  1C00            DC      /1C00      ADVANCE TAPE               3A812810
0A74 0  0A76      READ  DC      RAREA                                 3A812820
0A75 0  1200            DC      /1200                                 3A812830
0A76    0001      RAREA BSS     1                                     3A812840
0A77 0  0000      BITS1 DC      0          BIT SWITCH SETTINGS        3A812850
0A78 0  0000      BITS2 DC      0          LAST DEVICE SELECTED       3A812860
0A79 0  0000      BITS3 DC      0          LEVEL ON BITS              3A812870
0A7A 0  0000      GDCNT DC      0          GOOD PASS COUNT            3A812880
0A7B 0  0000      CLCNT DC      0          COLUMN COUNT               3A812890
0A7C 0  0000      LPCNT DC      0          LOOP COUNT                 3A812900
0A7D 0  F700      DELAY DC      /F700      SCOPE LOOP DELAY           3A812910
```


INTERRUPT TEST

```
0A7E 0  0000      DSW1  DC      0                                     3A812920
0A7F 0  0001      ADD01 DC      1                                     3A812930
0A80 0  0000      K000  DC      0          CONSTANT ZERO              3A812940
0A81 0  0001      K001  DC      1          CONSTANT 1                 3A812950
0A82 0  000A      K010  DC      10         CONSTANT 10                3A812960
0A83 0  0032      K050  DC      50         CONSTANT 50                3A812970
0A84 0  0050      K080  DC      80         CONSTANT 80                3A812980
0A85 0  0064      K100  DC      100        CONSTANT 100               3A812990
0A86 0  00FA      K250  DC      250        CONSTANT 250               3A813000
0A87 0  61A8      KMAX  DC      /61A8      CONSTANT 25000             3A813010
0A88 0  0DE0      TIME1 DC      /0DE0      DELAY - 62.5 MSEC          3A813020
0A89 0  1EE0      TIME2 DC      /1EE0      DELAY - 125 MSEC           3A813030
0A8A 0  3DC0      TIME3 DC      /3DC0      DELAY - 250 MSEC           3A813040
0A8B 0  1000      NOPIT DC      /1000                                 3A813050
0A8C 0  1801      SRA01 DC      /1801                                 3A813060
0A8D 0  180A      SRA10 DC      /180A                                 3A813070
0A8E 0  180B      SRA11 DC      /180B                                 3A813080
0A8F 0  70E9      MOFYA MDX  X  BUSY-MOD11-1                          3A813090
0A90 0  707B      MOFYB MDX  X  GAPIT-MOD13-1                         3A813100
0A91 0  706B      MOFYC MDX  X  GAPIT-MOD14-1                         3A813110
0A92 0  705B      MOFYD MDX  X  GAPIT-MOD15-1                         3A813120
0A93 0  704B      MOFYE MDX  X  GAPIT-MOD16-1                         3A813130
0A94 0  70F4      MOFYF MDX  X  GAPIT-MOD17-1                         3A813140
0A95 0  70D4      MOFYG MDX  X  GAPIT-MOD18-1                         3A813150
0A96 0  70C8      MOFYH MDX  X  GAPIT-MOD19-1                         3A813160
0A97 0  70BC      MOFYJ MDX  X  GAPIT-MOD1A-1                         3A813170
0A98 0  701A      MOFYL MDX  X  CKRUN-MOD11-1                         3A813180
0A99 0  7009      MDFY2 MDX  X  JUMP-MOD29-1                          3A813190
0A9A 0  7047      MDFY3 MDX  X  MOD22-MOD21-1                         3A813200
0A9B 0  7009      MDFY4 MDX  X  HOPIT-MOD23-1                         3A813210
0A9C 0  7083      MDFY5 MDX  X  HOPIT-MOD24-1                         3A813220
0A9D 0  709C      MDFY6 MDX  X  HOPIT-MOD25-1                         3A813230
0A9E 0  7087      MDFY7 MDX  X  HOPIT-MOD26-1                         3A813240
0A9F 0  7033      MDFY8 MDX  X  JUMP-MOD27-1                          3A813250
0AA0 0  701E      MDFY9 MDX  X  JUMP-MOD28-1                          3A813260
0AA2    0500            END     BEGIN                                 3A813270
```

INTERRUPT TEST

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
ADD01	0A7F	06F9
ADR12	0981	0844,0986
BAD12	07DB	051A,05EA,0634,067C
BAD14	07E7	051E,05EC,0636,067E
BEGIN	0500	0AA1
BITSW	0A66	0528,053E,0613,065B,06A3,06E0,07AC,0850,0909,0918, 0998,09CF,09FD,0A2A
BITS1	0A77	052D,0540,0615,065D,06A5,06E2,07AE,0852,090B,091A, 099A,09D1,09FF,0A2C,0A66
BITS2	0A78	0530,0618,0660,06A8
BITS3	0A79	0543,0548
BUSY	06DB	05D6,05F6,0620,0640,0668,0688,06DE,0714,07D9,09E3, 09E9,09EF,09F5,09FB,0A8F
BUZY	084B	084E,0875,087E
CARDS	0862	08D3,0928,0940,0955,096A,097F,0994
CHECK	0876	0873
CKBIT	0578	054A
CKDOK	07C7	05E8,0632,067A,0710
CKLOP	053E	061A,0662,06AA
CKOVR	09CF	09AD,09B5,09BD,09C5,09CD
CKRDY	087F	085B,0885
CKRUN	070C	06F1,0A98
CLCNT	0A7B	0876,087C,089A,08AF,08BF,08C9,08CD,08D6,0905,0914, 0921,0925,0930,093A,0945,094F,095A,0964,096F,0979, 0984,098E
CLERR	08C9	08C7
CLRIX	06AE	0552,07B3,091F
CNTCK	0998	0718
CNTIT	09FD	0869
CNTOK	08DA	0855,08C3
CNTRL	0A72	064A
CNT01	0A12	0A01
CNT02	0A18	0A04
CNT03	0A1E	0A07
CNT04	0A24	0A0A
COLGD	08A5	08A3
CONSL	0A64	0820
DELAY	0A7D	06E7,0857,09DF,0A3A
DISK	0A5E	0751
DLAY1	0A46	0A32
DLAY2	0A4C	0A35
DLAY3	0A52	0A38
DLYNO	0A40	0A2F
DLY01	09EB	09D7
DLY02	09F1	09DA
DLY03	09F7	09DD
DSWCK	07FF	05F0,05F2,05FC,05FE,063A,063C,0646,0648,0682,0684, 068E,0690,06EC,0806
DSW1	0A7E	07FF,0804,080E,087F,0883,088C
ENDCK	0A2A	0A10,0A16,0A1C,0A22,0A28
ERROR	071A	0718,07B5
FDCYC	0715	0708,0726,072E,07E5,07F1,07F0,081B
FEED	0A6A	0600,06EE
FEEDS	0A6C	0692
FINSH	07A8	060C,0610,0654,0658,069C,06A0
GAPIT	07B5	0A90,0A91,0A92,0A93,0A94,0A95,0A96,0A97
GDCNT	0A7A	06F5,0716,07A2,07A6,082A,0863,08B5,08FE,0916
GOLOP	0554	0584,058E,0598,05A2,05AC,05B6
HOPIT	08D5	0996,0A9B,0A9C,0A9D,0A9E
INT00	0897	082C
INT01	092D	0830,0932
INT02	0942	0834,0947
INT03	0957	0838,095C
INT04	08B2	083C,089C
INT05	096C	0840,0971

INTERRUPT TEST

JUMP	0996	0A99,0A9F,0AA0
KMAX	0A87	09C7,0A24
KNT01	09AF	099C
KNT02	09B7	099F
KNT03	09BF	09A2
KNT04	09C7	09A5
K000	0A80	09E5,0A40
K001	0A81	071E,07A4,086D
K010	0A82	060A,07A8,0900,09AF,0A0C,0A12
K050	0A83	09B7,0A18
K080	0A84	08C1
K100	0A85	0604,064E,0696,06FD,0722,0871,09A7
K250	0A86	09BF,0A1E
LESS1	085F	0860,08A7,08D8
LOOPS	0574	0577,0582,0588,0592,059C,05A6,05B0
LOOP0	0730	0580
LOOP1	0740	0586,058A
LOOP2	0750	0590,0594
LOOP3	0760	059A,059E
LOOP4	081D	05A4,05A8
LOOP5	07B7	05AE,05B2
LPCNT	0A7C	06F7,06FB,071C,0720,072C,0774,0819,086B,086F,087A, 0907
MAPIT	05C2	073E,074E,075E,076E,07C5,0827,091D
MDFY2	0A99	0990
MDFY3	0A9A	08A0
MDFY4	0A9B	08CF
MDFY5	0A9C	0927
MDFY6	0A9D	093C
MDFY7	0A9E	0951
MDFY8	0A9F	0966
MDFY9	0AA0	097B
MOD1A	07F8	06C5,07A0,07F6,07FB,0A97
MOD11	06F1	06F3,0709,070F,0778,07D3,0A8F,0A98
MOD12	091D	0568
MOD13	0739	0556,056A,06B7,06C9,0737,073C,0784,0A90
MOD14	0749	055A,056C,06B9,06CD,0747,074C,0788,0A91
MOD15	0759	055E,056E,06B8,06D1,0757,075C,078C,0A92
MOD16	0769	0562,0570,06BD,06D5,0767,076C,0790,0A93
MOD17	07C0	0566,0572,06BF,06D9,0794,07BE,07C3,0A94
MOD18	07E0	06C1,0798,07DE,07E3,0A95
MOD19	07EC	06C3,079C,07EA,07EF,0A96
MOD20	0826	0824
MOD21	0861	0867,08A2,08B1,08B9,08DC,0A9A
MOD22	08A9	08AC,08BD,08E0,0A9A
MOD23	08CB	08D1,08E4,0A9B
MOD24	0921	08C5,08E8,0929,0A9C
MOD25	0938	06EC,0936,093E,0A9D
MOD26	094D	08F0,094B,0953,0A9E
MOD27	0962	08F4,0960,0968,0A9F
MOD28	0977	08F8,0975,097D,0AA0
MOD29	098C	08FC,098A,0992,0A99
MOFYA	0A8F	07D1
MOFYB	0A90	073A
MOFYC	0A91	074A
MOFYD	0A92	075A
MOFYE	0A93	076A
MOFYF	0A94	07C1
MOFYG	0A95	07E1
MOFYH	0A96	07ED
MOFYJ	0A97	07F9
MOFYL	0A98	0776
NOADR	07F3	0522,05EE,0638,0680
NODLY	09E5	09D4
NOPIT	0A8B	05F8,068A
NORDY	0892	088E
NRDYA	058E	058A
NRDYB	05C8	05C4

INTERRUPT TEST

NRDYC	05D1	05CD
NUMBR	06FD	0606,0650,0698,09A9,09B1,0989,09C1,09C9
NUMCK	0722	0608,0652,069A,0685,09AB,0983,0988,09C3,09CB
PLOT	0A60	0761
PRINT	0A62	0741
RAREA	0A76	0A74
READ	0A74	08A5
RESET	0848	
RESTR	0A70	085D
RETRN	086B	0A3E,0A44,0A4A,0A50,0A56
RUNCK	06F0	C708,070E,077C,07CF
RUNOK	0701	070A,0780
SENPT	0A5A	05C1,061E,0731,0822
SENSE	0A58	0588,05D4,06DB,06E9,0729,0735,0745,0755,0765,0771, 07BC,07C8,07DC,07E8,07F4,0801,080A,081E,084B,0859, 0881,0889,0893,0898,08B3,092E,0943,0958,096D,0982
SEN25	0A5C	05CB,0666
SETPT	061E	05C6
SETUP	0829	060E,07AA,0910
SET25	0666	05CF
SET42	05D4	05BC
SRA01	0A8C	05F4,0686
SRA10	0A8D	0642
SRA11	0A8E	063E
START	0857	0887,0890,0895,0A3C,0A42,0A48,0A4E,0A54
STOP	0A68	0788
TABLE	0A6E	0A6C
TEST1	06E7	05D8,05FA,0602,0622,0644,064C,066A,068C,0694,0808, 0812,0815,09E1,09E7,09ED,09F3,09F9
TIME1	0A88	09EB,0A46
TIME2	0A89	09F1,0A4C
TIME3	0A8A	09F7,0A52
TOTAL	0871	0A0E,CA14,0A1A,0A20,0A26
VECT0	0580	0546
VECT1	0586	057E
VECT2	0590	054D
VECT3	059A	0579
VECT4	05A4	0550
VECT5	05AE	057C
VEC00	0734	0502,05DC,0626,066E,0733
VEC01	0744	0506,05DE,0628,0670,0743
VEC02	0754	050A,05E0,062A,0672,0753
VEC03	0764	050E,05E2,062C,0674,0763
VEC04	0770	0512,05E4,062E,0676,0681,06E5,0702,0705
VEC05	078B	0516,05E6,0630,0678,07BA
WAITA	0912	0656,069E,07B1,0902,090E
WAITC	07CC	07CA
WAITF	0501	
WAITG	0728	05DA,0624,066C,0724
WAIT1	0527	052A,0575
WAIT2	0817	06FF
WAIT3	0814	0810
WAIT8	053B	
WHAT1	05B8	0539
WHAT2	05C1	0536
WHAT3	05CB	0533
WHICH	0528	0526,053C,05BF,05C9,05D2,061C,0664,06AC

```
1.  PURPOSE          ************************************************** 30A00020
                     *                                                  30A00030
                     * THE 1130 DISK ACCESS PROGRAM WAS DESIGNED TO BE  30A00040
                     * USED WITH THE ACCESS ADJUSTMENT PROCEDURE FOUND  30A00050
                     * IN THE SDS MAINTENANCE MANUAL.                   30A00060
                     *                                                  30A00070
                     * THE PROGRAM WILL MOVE THE CARRIAGE BETWEEN       30A00080
                     * TRACKS 2 AND 200, AND COMPARE SECTOR ZERO        30A00090
                     * ADDRESSES AT THOSE TRACKS.                       30A00100
                     *                                                  30A00110
                     * THE SEEK OPERATION CAN BE SELECTED IN EITHER 10  30A00120
                     * OR 20 MILL MODE.                                 30A00130
                     *                                                  30A00140
2.  REQUIREMENTS     ************************************************** 30A00150
                     *                                                  30A00160
                     * THE C.E. MUST HAVE A 1130 SYSTEM WITH CARD       30A00170
                     * READER OR PAPER TAPE INPUT.                      30A00180
                     *                                                  30A00190
                     * THE CARD READER PROGRAM CONSISTS OF 4 CARDS.     30A00200
                     * THE 1ST CARD IS AN IPL LOADER, THE OTHER 3       30A00210
                     * ARE PUNCHED IN 8/8 FORMAT AND CONTAINS THE       30A00220
                     * MAIN PORTION OF THE PROGRAM.                     30A00230
                     *                                                  30A00240
3.  USE PROCEDURE    ************************************************** 30A00250
                     *                                                  30A00260
  3.1 SETUP AND      * A.  LOAD PROGRAM IN READER AND MAKE READER      30A00270
      START          *     READY.  ADD A BLANK CARD.                    30A00280
                     *                                                  30A00290
                     * B.  DEPRESS RESET AND PROGRAM LOAD PUSH          30A00300
                     *     BUTTONS. PROGRAM WILL STOP AT WAIT 0.        30A00310
                     *                                                  30A00320
                     * C.  AT WAIT 0, ENTER DISK DRIVE AREA CODE OF     30A00330
                     *     DESIRED DRIVE IN CONSOLE BIT SWITCHES        30A00340
                     *     0 THRU 4 AND CLEAR BITS 5 THRU 15.           30A00350
                     *                                                  30A00360
                     *                  DRIVE       BIT SW SETTING      30A00370
                     *                    0.................../2000     30A00380
                     *                    1.................../8800     30A00390
                     *                    2.................../9000     30A00400
                     *                    3.................../9800     30A00410
                     *                    4.................../A000     30A00420
                     *                                                  30A00430
                     * D.  DEPRESS START PUSH BUTTON.                   30A00440
                     *                                                  30A00450
  3.2 OPERATION      ************************************************** 30A00460
                     *                                                  30A00470
                     * THE PROGRAM WILL START OUT IN 20 MILL MODE.      30A00480
                     *                                                  30A00490
                     * THE CARRIAGE WILL SEEK HOME, GO TO TRACK 2,      30A00500
                     * READ SECTOR ZERO AND COMPARE FOR TRACK ADDR. 2   30A00510
                     *                                                  30A00520
                     * A GOOD COMPARE CAUSES THE CARRIAGE TO GO TO      30A00530
                     * TRACK 200, WHERE SECTOR ZERO IS READ AND         30A00540
                     * COMPARED FOR TRACK ADDR. 200                     30A00550
                     *                                                  30A00560
                     * A GOOD COMPARE WILL CAUSE THE CARRIAGE TO GO     30A00570
                     * BACK TO TRACK 2 AND REPEAT ABOVE OPERATION.      30A00580
                     *                                                  30A00590
                     * IF A COMPARE ERROR IS DETECTED, AN ERROR WAIT    30A00600
                     * ENCOUNTERED. SEE ERROR WAITS....(3.3).           30A00610
                     *                                                  30A00620
                     * TO STOP PROGRAM, DEPRESS IMMEDIATE STOP.         30A00630
                     *                                                  30A00640
                     * TO START PROGRAM, DEPRESS START.                 30A00650
                     *                                                  30A00660
                     * TO CHANGE FROM 20 MILL MODE OPERATION TO 10      30A00670
                     * MILL OPERATION, OR FROM 10 MILL OPERATION TO     30A00680
                     * 20 MILL OPERATION,  A. DEPRESS IMMEDIATE STOP.   30A00690
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                     *                  B. DEPRESS PROGRAM RESET.     30A00700
                     *                  C. DEPRESS START.             30A00710
                     *                                                30A00720
  3.3 WAITS          ************************************************** 30A00730
                     *                                                  30A00740
       /3000         * ENTER DISK DRIVE AREA CODE.  ( SEE 3.1 C )      30A00750
                     *                                                  30A00760
    ERROR WAITS      ************************************************** 30A00770
                     *                                                  30A00780
       /30F1         * THE ADDRESS OF TRACK 2, SECTOR ZERO WAS READ    30A00790
                     * AND FOUND INVALID.                               30A00800
                     *                                                  30A00810
                     * CHECK IF CARRIAGE IS SETTING AT DETENT 2.        30A00820
                     *                                                  30A00830
                     * IF CARRIAGE IS 'NOT' IN CORRECT DETENT,          30A00840
                     * DEPRESS START TO CONTINUE ADJUSTMENT.            30A00850
                     *                                                  30A00860
                     * IF CARRIAGE IS IN CORRECT DETENT, DO A SECTOR    30A00870
                     * REWRITE.    ************************************ 30A00880
                     *             ********** CAUTION ********** ****** 30A00890
                     *             ************************************ 30A00900
                     *             *                                  * 30A00910
                     *             * ONLY USE TRACK 2 REWRITE OPTION  * 30A00920
                     *             * WHEN SETTING AT WAIT /30F1.      * 30A00930
                     *             *                                  * 30A00940
                     *             * REWRITE OPTION WILL DESTROY      * 30A00950
                     *             * ORIGINAL SECTOR DATA.            * 30A00960
                     *             *                                  * 30A00970
                     *             ************************************ 30A00980
                     *                                                  30A00990
                     *          A. LOAD I REG TO /0043.                 30A01000
                     *          B. PLACE CONSOLE SW IN RUN.             30A01010
                     *          C. DEPRESS START.                       30A01020
                     *                                                  30A01030
                     ************************************************** 30A01040
                     *                                                  30A01050
       /30F2         * THE ADDRESS OF TRACK 200, SECTOR ZERO WAS READ  30A01060
                     * AND FOUND INVALID.                               30A01070
                     *                                                  30A01080
                     * CHECK IF CARRIAGE IS SETTING AT DETENT 200.      30A01090
                     *                                                  30A01100
                     * IF CARRIAGE IS 'NOT' IN CORRECT DETENT,          30A01110
                     * DEPRESS START TO CONTINUE ADJUSTMENT.            30A01120
                     *                                                  30A01130
                     * IF CARRIAGE IS IN CORRECT DETENT, DO A SECTOR    30A01140
                     * REWRITE.    ************************************ 30A01150
                     *             ********** CAUTION ********** ****** 30A01160
                     *             ************************************ 30A01170
                     *             *                                  * 30A01180
                     *             * ONLY USE TRACK 200 REWRITE OPTION * 30A01190
                     *             * WHEN SETTING AT WAIT /30F2.      * 30A01200
                     *             *                                  * 30A01210
                     *             * REWRITE OPTION WILL DESTROY      * 30A01220
                     *             * ORIGINAL SECTOR DATA.            * 30A01230
                     *             *                                  * 30A01240
                     *             ************************************ 30A01250
                     *                                                  30A01260
                     *          A. LOAD I REG TO /0046.                 30A01270
                     *          B. PLACE CONSOLE SW IN RUN.             30A01280
                     *          C. DEPRESS START.                       30A01290
                     *                                                  30A01300
                     ************************************************** 30A01310
                     *                                                  30A01320
       /30F3         * LOST INERRUPT WHILE READING IN PROGRAM.         30A01330
                     *                                                  30A01340
  3.4 TERMINATION    ************************************************** 30A01350
                     *                                                  30A01360
                     * TO TERMINATE PROGRAM DEPRESS IMMEDIATE STOP.     30A01370
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                        *                                                     30A01380
      4  PRINTOUTS      ***************************************************** 30A01390
                        *                                                     30A01400
                        * NONE                                                30A01410
                        *                                                     30A01420
      5  COMMENTS       ***************************************************** 30A01430
                        *                                                     30A01440
                        * TO RERUN PROGRAM ON ANOTHER DRIVE, PROGRAM MUST     30A01450
                        * BE RELOADED.                                        30A01460
                        *                                                     30A01470
                        ***************************************************** 30A01480
                             ABS                                              30A01490
0000                         ORG     0                                       30A01500
                        *                                                     30A01510
                        *********************************************         30A01520
                        *                                           *         30A01530
                        *           3 CARD LOADER PROGRAM           *         30A01540
                        *                                           *         30A01550
                        *********************************************         30A01560
                        *                                                     30A01570
0000 0 603B             BGN   LDX     BUILD     GO BUILD IOCCS                30A01580
                        *                       LDX   PROGM IF P.T.           30A01590
0001 0 0000                   DC      *-*       CARD RD IN AREA               30A01600
0002 0 0000             DSW   DC                                              30A01610
0003 0 B818                   DC      /B818     IOCC-SENSE/RESET DSW          30A01620
0004 0 0000             RDIN  DC      *-*       COL RD IN ADDR                30A01630
0005 0 4800                   DC      /4800     IOCC-READ COLUMN              30A01640
0006 0 0001             ONE   DC      1         CONSTANT 1                    30A01650
0007 0 0004             FOUR  DC      4         CONSTANT 4                    30A01660
0008 0 000E             RDCRD DC      INT       RDR INTERRUPT ADDR            30A01670
0009 0 2808                   DC      /2808     IOCC-START READER             30A01680
000A 0 003D                   DC      INT2      DISK INTERRUPT ADDR           30A01690
000B 0 0003             LAST  DC      3         LOADER CARD COUNT             30A01700
000C 0 000E                   DC      INT       READER INTERRUPT ADD          30A01710
000D 0 0034                   DC      INT5      PROG STOP INTERRUPT           30A01720
                        *                                                     30A01730
000E 0 0000             INT   DC      *-*       READER INTERRUPT              30A01740
000F 0 08F2                   XIO     DSW       * SERVICE ROUTINE             30A01750
0010 0 4850                   BOSC    -         *                             30A01760
0011 0 7001                   MDX     INT1      BR IF NOT RESPONSE            30A01770
0012 0 7005                   MDX     WAITI&1   BR IF RESPONSE                30A01780
0013 0 4848             INT1  BOSC    &         RESET OP COMPLETE             30A01790
0014 0 0000                   DC                                            30A01800
0015 0 7011                   MDX     ENCRD     BR, END OF CARD               30A01810
0016 0 08F1                   XIO     RDCRD     START READER                  30A01820
                        *                                                     30A01830
0017 0 30F3             WAITI WAIT    -/D       WAIT FOR INTERRUPT            30A01840
0018 0 08EB                   XIO     RDIN      RD COL. ONE-HALF WD           30A01850
0019 0 C0EA                   LD      RDIN      *                             30A01860
001A 0 F0EB                   EOR     ONE       SW READ/IN AREA, EVN          30A01870
001B 0 D0E8                   STO     RDIN      * COLS. IN 0, ODD IN 1        30A01880
001C 0 4820                   BSC     Z         CHK BOTH HALVES IN            30A01890
001D 0 70F9                   MDX     WAITI     NO, WAIT 2ND HALF             30A01900
001E 0 C0E1                   LD      BGN       YES, PACK BOTH HAVES          30A01910
001F 0 1808                   SRA     8         *                             30A01920
0020 0 F0E0                   EOR     BGN&1     *                             30A01930
                        *                                                     30A01940
0021 0 00D4             STORE DC      /00D4     1ST WORD OF STO L             30A01950
0022 0 003B                   DC      BUILD     2ND WORD OF STO L             30A01960
0023 0 C0FE                   LD      STORE&1   SET UP NEXT STORE             30A01970
0024 0 80E1                   A       ONE       * ADDRESS                     30A01980
0025 0 D0FC                   STO     STORE&1   *                             30A01990
0026 0 70F0                   MDX     WAITI     GO WAIT FOR NEXT COL          30A02000
                        *                                                     30A02010
0027 0 C0E3             ENCRD LD      LAST      CHK FOR LAST CARD             30A02020
0028 0 90DD                   S       ONE       LOADED                        30A02030
0029 0 D0E1                   STO     LAST      *                             30A02040
002A 0 4808                   BSC     &         *                             30A02050
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002B 0 6030             LDX     PROGM     YES, BRANCH TO PROG           30A02060
                        *                                               30A02070
002C 0 C0F5             LD      STORE&1   NO, SET UP NEXT READ          30A02080
002D 0 90D9             S       FOUR      * IN AREA                     30A02090
002E 0 D0F3             STO     STORE&1   *                             30A02100
002F 0 70E6             MDX     WAITI-1   GO READ NEXT CARD             30A02110
                        *                                               30A02120
0030 0 C83F             PROGM LDD     RESRT     *  SET AREA CODE IN       30A02130
0031 0 D8CE             STD     BGN       ** BIT SWITCHES               30A02140
0032 0 3000             DC      /3000     **                            30A02150
0033 0 7019             MDX     AGAN1-2   *                             30A02160
                        *                                               30A02170
0034 0 0000             INT5  DC      *-*       *                       30A02180
0035 0 083C             XIO     SPDSW     ** PROGRAM STOP               30A02190
0036 0 603B             LDX     INT5A     *  INTERRUPT ROUTINE          30A02200
0037 0 0000             DC                                              30A02210
0038 0 0000             DC                                              30A02220
0039 0 0000             DC                                              30A02230
003A 0 0000             DC                                              30A02240
                        *                                               30A02250
003B 0 C0C7             BUILD LD      DSW&1     BUILD SENSE DSW         30A02260
003C 0 1803             SRA     3         ********************          30A02270
003D 0 D0C5             STO     DSW&1     *       NOTE       *          30A02280
003E 0 C0CA             LD      RDCRD&1   * INSTRUCTIONS FROM*          30A02290
003F 0 1801             SRA     1         * BUILD THRU INT5A *          30A02300
0040 0 D0C8             STO     RDCRD&1   * DO NOT APPEAR ON *          30A02310
0041 0 C0C3             LD      RDIN&1    * PAPER TAPE       *          30A02320
0042 0 1802             SRA     2         ********************          30A02330
0043 0 D0C1             STO     RDIN&1    *                             30A02340
0044 0 C0DC             LD      STORE     *                             30A02350
0045 0 1008             SLA     8         *                             30A02360
0046 0 D0DA             STO     STORE     *                             30A02370
0047 0 6016             LDX     WAITI-1   GO START READER               30A02380
                        *********************************************   30A02390
                        *                                               30A02400
0048                         ORG     BUILD                              30A02410
                        *********************************************   30A02420
                        *                                           *   30A02430
                        *          DISK ADJUSTMENT PROGRAM          *   30A02440
                        *                                           *   30A02450
                        *********************************************   30A02460
                        *                                               30A02470
003B 0 4CC0 0034        INT5A BOSC I  INT5      EXIT TO RETURN          30A02480
                        *                                               30A02490
003D 0 0000             INT2  DC      *-*       *                       30A02500
003E 0 0835                   XIO     SNDSW     ** DISK INTERRUPT       30A02510
003F 0 4C40 008C              BOSC L  TEST&2    *  ROUTINE              30A02520
                        *                                               30A02530
0041 0 0000             TOGGL DC      *-*       MODE TOGGLE             30A02540
0042 0 0000             AREA  DC      *-*       CURRENT AREA CODE       30A02550
                        *                                               30A02560
0043 0 0832             WTTWO XIO     WRT02     * WRITE ADDRESS AT      30A02570
0044 0 4045                   BSI     TEST      * TRACK 2               30A02580
0045 0 7002                   MDX     SKHME     *                       30A02590
                        *                                               30A02600
0046 0 0831             WTHND XIO     WRT20     * WRITE ADDRESS AT      30A02610
0047 0 4042                   BSI     TEST      * TRACK 200             30A02620
                        *                                               30A02630
0048 0 0833             SKHME XIO     HOME      * GO HOME               30A02640
0049 0 4040                   BSI     TEST      *                       30A02650
004A 0 0833                   XIO     TRK2      ** GO TO TRACK          30A02660
004B 0 403E                   BSI     TEST      ** 2                    30A02670
004C 0 7048                   MDX     CHCK2     *                       30A02680
                        *                                               30A02690
                              LDX   2 16        *                       30A02700
                              XIO     RDSPS     **                      30A02710
004D 0 6210             AGAN1 LD    2 SNDSW-1   * *                     30A02720
004E 0 0835                   OR      AREA      *  * SET AREA CODE      30A02730
004F 0 C273
0050 0 E8F1
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0051 0 D273                STO   2 SNDSW-1     *  * INTO IOCC          30A02740
0052 0 72FE                MDX   2 -2          * *                     30A02750
0053 0 70FB                MDX     AGAN1       **                      30A02760
0054 0 70F3                MDX     SKHME       *                       30A02770
                       *                                              30A02780
0055 0 C0EB          ONWD0 LD      TOGGL       *                       30A02790
0056 0 4C20 005E           BSC  L  ONWD1,Z     ** BR IF 10 MIL MODE    30A02800
0058 0 C01B                LD      SNDSW       * *                     30A02810
0059 0 D026                STO     TWHND       *  *                    30A02820
005A 0 D027                STO     TWO         *   *                   30A02830
005B 0 6201                LDX   2 1           *    *                  30A02840
005C 0 6301                LDX   3 1           *     * SET PROPER      30A02850
005D 0 7006                MDX     CMND1       *     *  MODE           30A02860
005E 0 6201          ONWD1 LDX   2 1           *    *                  30A02870
005F 0 6A20                STX   2 TWHND       *  *                    30A02880
0060 0 6A21                STX   2 TWO         * *                     30A02890
0061 0 C012                LD      SNDSW       **                      30A02900
0062 0 D09F                STO     BGN&2       *                       30A02910
0063 0 D09F                STO     BGN&3       *                       30A02920
                       *                                              30A02930
0064 0 081B          CMND1 XIO     TWHND       *                       30A02940
0065 0 4024                BSI     TEST        ** GO TO TRACK 200      30A02950
0066 0 72FF                MDX   2 -1          **                      30A02960
0067 0 70FC                MDX     CMND1       *                       30A02970
0068 0 0811                XIO     READ        *                       30A02980
0069 0 4020                BSI     TEST        **                      30A02990
006A 0 C037                LD      INPUT&1     * *                     30A03000
006B 0 F01D                EOR     OUT20&1     *  * READ/COMPARE       30A03010
006C 0 4C18 0091           BSC  L  CMND2,&-    * *  ADDR AT TRK 200    30A03020
006E 0 30F2                DC      /30F2       **   ERROR, DID NOT     30A03030
006F 0 70D8                MDX     SKHME       *    COMPARE            30A03040
                       *                                              30A03050
0070   0000                BSS  E                                      30A03060
0070 0 4C00 009D     RESRT BSC  L  RSTRT       MODE CHANGE SET/UP      30A03070
0072 0 0000          SPDSW DC                                          30A03080
0073 0 3F01                DC      /3F01       IOCC-SENSE RESET (5)    30A03090
0074 0 00C6          SNDSW DC      198         CONSTANT 198            30A03100
0075 0 0701                DC      /0701       IOCC-SENSE/RESET DSW    30A03110
0076 0 0086          WRT02 DC      OUT02                               30A03120
0077 0 0500                DC      /0500       IOCC-WRITE TRACK 2      30A03130
0078 0 0088          WRT20 DC      OUT20                               30A03140
0079 0 0500                DC      /0500       IOCC-WRITE TRACK 200    30A03150
007A 0 00A1          READ  DC      INPUT                               30A03160
007B 0 0600                DC      /0600       IOCC-READ ADDRESS       30A03170
007C 0 00CA          HOME  DC      202                                 30A03180
007D 0 0404                DC      /0404       IOCC-SEEK HOME          30A03190
007E 0 0002          TRK2  DC      2                                   30A03200
007F 0 0400                DC      /0400       IOCC-GO TO TRK 2        30A03210
0080 0 0000          TWHND DC      *-*                                 30A03220
0081 0 0400                DC      /0400       IOCC-GO TO TRK 200      30A03230
0082 0 0000          TWO   DC      *-*                                 30A03240
0083 0 0404                DC      /0404       IOCC-BACK TO TRK 2      30A03250
0084 0 0042          RDSPS DC      AREA                                30A03260
0085 0 3A00                DC      /3A00       IOCC-READ BIT SWS       30A03270
0086 0 0001          OUT02 DC      1           WRT TRK 2 TABLE         30A03280
0087 0 0010                DC      /0010       *                       30A03290
0088 0 0001          OUT20 DC      1           WRT TRK 200 TABLE       30A03300
0089 0 0640                DC      /0640       *                       30A03310
                       *                                              30A03320
008A 0 0000          TEST  DC      *-*         *                       30A03330
008B 0 08E8                XIO     SNDSW       **                      30A03340
008C 0 180D                SRA     13          * * CHECK FOR FILE      30A03350
008D 0 4804                BSC     E           * * READY               30A03360
008E 0 70FC                MDX     TEST&1      **                      30A03370
008F 0 4C80 008A           BSC  I  TEST        *                       30A03380
                       *                                              30A03390
0091 0 08F0          CMND2 XIO     TWO         *                       30A03400
0092 0 40F7                BSI     TEST        * GO TO TRACK 2         30A03410
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0093 0 73FF                MDX   3 -1          *                       30A03420
0094 0 70FC                MDX     CMND2       *                       30A03430
0095 0 08E4          CHCK2 XIO     READ        *                       30A03440
0096 0 40F3                BSI     TEST        **                      30A03450
0097 0 C00A                LD      INPUT&1     * *                     30A03460
0098 0 F0EE                EOR     OUT02&1     *  * READ/COMPARE       30A03470
0099 0 4C18 0055           BSC  L  ONWD0,&-    * *  ADDR AT TRK 2      30A03480
009B 0 30F1                DC      /30F1       **   ERROR, DID NOT     30A03490
009C 0 70AB                MDX     SKHME       *    COMPARE            30A03500
                       *                                              30A03510
009D 0 C0A3          RSTRT LD      TOGGL       *                       30A03520
009E 0 F0E7                EOR     OUT02       ** CHANGE MODE          30A03530
009F 0 D0A1                STO     TOGGL       **                      30A03540
00A0 0 70A7                MDX     SKHME       *                       30A03550
                       *                                              30A03560
00A1 0 0002          INPUT DC      2           INPUT AREA              30A03570
00A2   0002                BSS     2           *                       30A03580
00A4   0000                END     BGN                                 30A03590
 NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY
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C R O S S R E F E R E N C E

NAME	VALUE	REFERENCES
AGAN1	004F	0033,0053
AREA	0042	0050,0084
BGN	0000	001E,0020,0031,0062,0063,00A4
BUILD	003B	0000,0022
CHCK2	0095	004C
CMND1	0064	005D,0067
CMND2	0091	006C,0094
DSW	0002	000F,003B,003D
ENCRD	0027	0015
FOUR	0007	002D
HOME	007C	0048
INPUT	00A1	006A,007A,0097
INT	000E	0008,000C
INT1	0013	0011
INT2	003D	000A
INT5	0034	000D,003B
INT5A	003B	0036
LAST	000B	0027,0029
ONE	0006	001A,0024,0028
ONWD0	0055	0099
ONWD1	005E	0056
OUT02	0086	0076,0098,009E
OUT20	0088	006B,0078
PROGM	0030	002B
RDCRD	0008	0016,003E,0040
RDIN	0004	0018,0019,001B,0041,0043
RDSPS	0084	004E
READ	007A	0068,0095
RESRT	0070	0030
RSTRT	009D	0070
SKHME	0048	0045,0054,006F,009C,00A0
SNDSW	0074	003E,004F,0051,0058,0061,008B
SPDSW	0072	0035
STORE	0021	0023,0025,002C,002E,0044,0046
TEST	008A	003F,0044,0047,0049,004B,0065,0069,008E,008F,0092,0096
TOGGL	0041	0055,009D,009F
TRK2	007E	004A
TWHND	0080	0059,005F,0064
TWO	0082	005A,0060,0091
WAITI	0017	0012,001D,0026,002F,0047
WRT02	0076	0043
WRT20	0078	0046
WTHND	0046	
WTTWO	0043	

END OF ASSEMBLY

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