OBJECT CARD LISTING

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

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
°GBK°GBD°°°°PN°42	47602°EC°571931°	3340°FUNCTION°TE	STS°-----°MOD°12	84@@84@@°°°°°°°°	°°°°°°°°C1230000
TCOY¦OK<°°&°°BT,	°°@E°°A°&°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°7Y*C1230001
T°°YR°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°K:-C1230002
T+-Z4°&°H¦COHH¦#°	°/1+2BU8HR%BGER¬°	°/1/TOH*QK3YAH&#°	°/1/TOH*QK@BGEIQ°	¦°BT=H°"°°JL>OH*°	BE-H°*00C1230003
TG-D̄L°°D1¦°°HV<B°	GD#HH/°D¬OH*NV@B°	GFF¦°/1E_OH*N>O°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°$D@C1230004
T(O,<°°C°/1E_OH*	MV-8°BZ&YC34<BZL°	-/L>OH*BE-<°B>Y°	@°°,(OH*L%-,AB_T°	/1OPOH*QQ@BGE$%	°°°°°8SUC1230005
T(O%E°N7°/1E_OH*	MV-8°B%4YC34<B%7°	-/L>OH*BE-&°B3-°	@°°%FOH*L%-%BB2$°	/1OPOH*QQ@BGES%	°°°°°}.MC1230006
T+-_A°°C°/1E_OH*	P&&°:°KU<+-DZC%B°	GE%C°/1$"OH*MV-8°	BOQYC34<BO$°-/L°	>OH*BE-M°B@&@°°_	MOH*°5SUC1230007
TD&_LD#H.M°>2OH*	NV@BGF¦°/1O#°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°;E°C1230008
T+->¦°N7°/1E_OH*	EH*BGE4D°OH*EH*B°	GE4DAT&HMHB¬°°J3°	3(&DZCU4C°2-9@YD°	LC°<Z<B-9G°<Z(°<	:-B-°¬BMC1230009
T+-?H9*BGG&¦K°&&	¦°KUVHAP°°&_:+°D°	ZCTYAH&#°U°_POH*	MV-8°B5&YC34<B5L°	°-/L>OH*BE-Q°CE4°	@BS-°;/@C1230010
T+-0E"%8GD#H.801	¦OH*NV@BGFF¦°/1O°	#°°E)>°-°OA°MV%B°	GED7°/1YZOH*P&&G°	°/1YZOH*RA-H°OH*	EH*°°:QC1230011
T+-1°/1)A°Y4BEB-	XO°D*@3MAH&9(°0<	Y+¬HAD0OCHL°Y+JO°	CHL&C+Y°Y9*BGG&¦°	K°&&¦°KUVHAP°°&O°	P+°D°JHDC1230012
T+-1#H&8:°KU+0I°	.8@BGEIQ¦°BT=H"°	°°JL>OH*BE-*°CI¦°	°/1+2CFU<T#-H°<°	&EI$°/1OPOH*QQ@B°	GE$%°0C8C1230013
T+&25°°E)OH*O,*B°	GF.,°/1$°OH*MV%B°	G°/QH°°4Y¦°°<_%B°	GD#H<D04OOH*NV@B°	GFF+8B°C°DAKOOH*	N>0°°)/&C1230014
T+-31°N7°/1E_OH*	Q6@BGE4DAOH*RA-H°	MOH*P&JD(°/&YI@°	AG¦<5°KU+L&<CHCX°	2-J<<°2UOHCU*°2U°	4°3Y°°Y8C1230015
T+-4%-BTVOH*)°°H°	AA°@AHKMYE*°AC(8°	8°KU++-DZC%B&C<G°	°/1KOC-°<_S-¦|&%°	<_%°DE+#°/OHOB&°	+HCO°0CDC1230016
TG&5H°°5.OH*L%-5°	°C-#°/1OPOH*QQ#-°	H°<°&EI$°/1O#°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°&8MC1230017
T+-6F°N7°/1)A°*B°	GF&QBITMAH&8<°KU°	%HB°<°0<Y+)HAA°@°	AHKOYE*°ACO<+°KU°	+HB¬°/1WV°SQ¦°KU°	+HB*°N°HC1230018
T+-7A¦°D(V&0AC$U°	YJ*BGE9Y°BL4.CRP°	2°&Q<°&69C$%<°KU°	%HB%<°&6#H&8+°&6°	#HA<(°0°°°°C2-K°°	<°&4°&.*C1230019
T+-7@4°69C°D(5-6°	#C°<Z<°°°C°<Z(°°°	°+Y°Y9*BGG&<°°&6°	N@YDFC-D(>K-NC-D°	(>2-NCODZ.B-¦O°D°	(_-8°98DC1230020

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-87°°6NHA@°H&6°	NOHH(U*BGEIQ+°°5°	.H̄°@°B05.0°&M#%B°	G°/QH̄°°#TC°<Y¦K-	9¦¦8Y+@BGD#H+J&#	(OH*°)1MC1230021
T+-92ER¬°/1/TOH*	N>0°AP*BGED7°/1Y°	Z¦¦@%)03=.GQ%)00°	BH7YY¦<BGF$UA°<G°	CG(C°/1YZOH*R3&D°	°0*<°K8HC1230022
T+-:_G(C°/1YZOH*	Ē°&D°0*<*4<BGFSX°	°/1YN°&CA013&OH*	EHL17H7X°/1X(°&C°	A00:XOH**13/°HKT°	°UA0°;HQC1230023
T+-#Y?%BGFSX°/1Y°	N°&CA00#AOH**13/°	HKT°UA2=OH*MV-8°	HC%Y+3YAHC%'"2-	#0°DH#%BG°/Q.°°=	D¦°Y°KCUC1230024
T+-@TH¦#°/1+2COH°	¦X<BGER¬°/1/TOH*	N>0°AP*BGED7°/1Y°	Z¦¦@%;°3".G%;°0°	CH78Y+&0AH7%Y+&0°	AH7U°PH8C1230025
T+-';H°%8°KU+@Z°	FC°M,¬2_=OH*R>&D°	0*<¦&*BGG<*8&BU°	YOI°*?T-AH&#2D°8°	(°2>BHCP°°J4COH*	¦E°4°E10C1230026
T+-=R°2>CHCP°°J4°	COH*EH*PGF-DA°<G°	CC7,°/13G+D°ZH<8°	&G.8(°2>BHCX°°J4°	C+°DZCTYAH&#°U°@°	BOH*°EH<C1230027
T+-"MEIQ¦°BT=H"°°	°JL>OH*BE-O°DDU°	<°2-°HCU@"S-@OH*	L%-"¦DC¦°/1OPOH*	QQ@BGE$%°°°N7°/1E	_OH*°L$*C1230028
T+/°¦FSU¬"217C¦8°	%)S17C°<,:2-°¦¦@°	,¬<BGF*4A°<GCC"X°	°/13G+D°ZH<°&GJ<	(°2>AHCP°°J4COH*	EH*°°O-0C1230029
T+/AH/1YN°&CA01°	)OH**13/°HKT°DA4°	LC&<,-K-90°D)°@B°	GEIQ+°B-@HCO:°K-	@¦¬@Y¦<°AE+#°/OH°	OC&°°7D&C1230030
T+/BEDI.°/1+2DF&	&T%BGER¬°/1/TOH*	N>0°AP$-H°<°&EI$°	°/1E_OH*Q6@BGE4D°	AOH*RA-HLOH*RP-H°	LOH*°:$<C1230031
T</B8E"4BD@BGEI$°	°/OHOC-°J°OOAD.Y°	Y8@HAB-D4°KT=OH*	L%/B"D+?°/1OPOH*	QQ@BGE$%°°°°°°°°	°°°°°6T@C1230032
TIJC-OH*O,LMAH¦8°	<°JCSD.Y;°JCS°C?	"D+D(°JCSHBX°/AC°	IOH*N>0°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°4H*C1230033
T+/D)OH*O,*BGEIQ°	<°JB:D+H+°KT=H°@°	°C8T°0°DM#%BG°/Q°	¦°AG.+J°BB3V°°-,	°UAG#+2°HFLO°I=#	30°D°4DHC1230034
T+/EQO*DJG%GBDK.°	°/2D>OH*¬_LGDHDX°	°/2°++H°Y9¦H&I%B°	GG#P31°G°/2°++H°	Y9¦H&E°0BHKOYL°8°	BHKO°2-YC1230035
T+/FLH"°YAETO*H°	JNLCDHKY<°KU%HH<°	¦°KU%H"°°JE_<<&	ZD-4AHJHZH?HAAC3°	OI=85°K/I(-DY.L&	AHKY°J1HC1230036
T+/G+(-DYH3&AHKO°	(°KUKHK,°-JGAC&D°	ZDSU%0HDJOL31I=8°	(°KUKHDX2-&&@S¬°	>(&°X#?HAE<BGHK#°	°/OH°&A4C1230037
T+/HIF%Q$H°GA°*B°	G°S.A°&4°°THH°<B°	AHG.°/OHD°A°°DDM°	@°AHVOH*L%/G#DY8°	°"2UD@YDP@@J=OH*	BFUQ°7I4C1230038
TF/HUMB.@0;L°/OH°	SO;L°/1G?OH*NV@B°	GFF¦°/1O#°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°3B°C1230039
T+/I-°N411K/#<*H°	YP%BGFH*!1K/#<*H°	YP%BGF.D<°/&YG&0°	GH7@YB@BGF&Q°°<B°	GE4D°OH*Q6@BGE?@	5°KU°;$&C1230040
T+/H$C-OAHKOYI40°	C°2-94-DDCODZ.B-	NU°DKEHOBEB-XOH*	RA-D°OH*P&&G°/1K°	GC-°KIK-¦|&OKI*B°	BE+8°;CHC1230041
T+/.O+3°BB@BG°SY°	D&C""@BGD#HK5J.	N¦¬@ZA¦HAG¬¦D¬-0°	(H%4UX*8G°/ZFMB.	@0;L°/OHSO;L°/1H°	Z<*&°8YMC1230042

C123 3340 FUNCTION TESTS - MOD 12

OBJECT CARD LISTING

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

T+/<JHD<% A.T TY  AD>|3  ¬AO/.V+A   Z$LX-HO72U.PB KV  =C  Z+KV?C  Z(2V  OC  Z+BV1C  Z(SV  6C H NA%C1230043
T+/(<HKOZ+JO D2Q  AG  LH-H* A<> 3%   HKY# BU.+O Z.G4  | <BAD:U) SU%A?H  AA'HAA@BGD1 * BU  5 <  02-C1230044
T+/+G/OH; KU5H4"   /OH; KU9H63 /OH  ; KU7H8X /OH; KU  8H:$ /OH; KU6H@|   /OHEOJ8TL@DAOH*  BFYD ODHC1230045
T+/|BGK(%OH*BFYD  )H8X /OHE-J4TZ%B  G /DEGK|COH*BH%D  A+3 BB@BG SY ( -  Z.CMAHKO* JM4 JO  AE+4 61%C1230046
T+/|' 'HAAC&AEIP  31G88 &YROA -GC-  -B/X UBA2<*MY;3G  EHE8@ BTU|  Y9L3  OH|@< KU<HD*< KU  +HDU *BHC1230047
T+/&8C <Y:OH(O-D  Z TU& -%9& HH@Z   PO-HZ+X&B )HA ,O    C/  -32U +:B    9H H.+K BB?H&E@H  BHN  K1&C1230048
T+/J3) HA4-DB?     +B BC|H& #YH G3  " <HAH&H4 KUA)&H  A¬¬@ @-DMOH*BFUQ  DH;$A8%BG S.A8%B  GD"8 3T&C1230049
T+/K>>U  C DZHB-  .<*MYLTGEHFH11K/  UC¬@MSJKI@@K OH*    ||D¬T7OH|"2-JH  < BG7H|" /OHE//U  /"30 *:MC1230050
T+/LZ@BT"(&DZ P7  " ?HACXMB 'HA T&  AH&G /1L>O-DZ T&  AH&E5 -G /OHK+D   Y9|H&B%BG S.A L_   H+& &8DC1230051
T+/MUOH*   OAH&O  YJOOAH&&YK&4CH+%  BC* AD@%#A2TU+3   Y9 OAHK-YB3GEHD8  11K/S<*MYR 7"EJ8  NG?< 2DOC1230052
T+/N¬1HB8& B:& C   UAKKOH*  ||D¬T    H+*'-2TWOHD-GC7  OH|" -J8K>@  +&M  ZH<B&H.*8 KUY@/   SA-  M:@C1230053
T+/OEH|@YCC73H|"   AAL>OH*BFYQ*HU4  @@BT"+U Y9<BGEI$   /OHE/THS<L%-B/X   /OHSO&G /OHD&C&  HEDO 3-QC1230054
T+/PNC &Y@B&L?    F? DGT UNH %<AST  7I 8<ABT@I 72/'H  4BBU%(&DZ. ODH|   UFAOBHK%BC QY'2&  +C & 8QUC1230055
T+/Q&H|OUC&8AHK%  Y<¬HBB-Q-H|*YC<B  GE)Y+ BUZHCG2--Y  FDBT@H 3 /1P_G H  Z. H@B2UZ>H  @Z   .| D ¬DUC1230056
T+/R.HKV' &C /AK  O?  F?  GT UNH %  ; KU% -@ HKUYC@   AESM+ KU%HK,K &<  4 JE%O-C   4AHKO  YH¬H KKDC1230057
T+/EF--7K &D| KU  %HBG /1RE_ D+T D  &HKO4 KUDC-DZHS-  1@YHHAS Y@2-<OH*  ORO8AHKOY<¬HBB-Q  -H|U 9H4C1230058
T+/$AH 3 /1R:OH*  E|&4AH&8ZD% AG(U  (BKU*HK$  J33, <  .D<BG   4BA$=C &  Y@B&)? DF? DG@Y*  &( - 4I<C1230059
T+/$@E?8<ABTOIBH  @ &E@B&;<BJMYB@B  GFT4_ 2U/B@ AG|<  5 KU+X -MB(HABL&  AHKO( KU%HJ.  J3  ROH* EC@C1230060
T+/*7   4BA) C &  Y@B&X? DF? -G?    J?  NOH*E|@4HEBU  VO D*@#O DLMAH&:  6 JH6 J&4 KU%C&D  Z.BU LS4C1230061
T+/)2D% AG(X /O    ( -P& ODH| U..O  AA,OBA8OCEK-.(&D  P&IO D&C /1Y'T H  MHKM+ J) H " /1*  R( - LKMC1230062
T+/;_E4 <ABTOICF  @ &E@A ;@ AM5 J)   X  J <BGFT4+ J)   H " /1*R( -P" O  DH| U(,OAA,O A3M  AE"O Q,<C1230063
T+/¬YX  J IO E&G   /1Y',- JEL7"HK$    J33T&-MHKP  J3  3?  J(&DZC,QAD,Q  AEH8 EK-10 HP5T&  AHKO 9H<C1230064
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C123 3340 FUNCTION TESTS - MOD 12

OBJECT CARD LISTING

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

T+/-TC&DZ.BUKO D  *6&8AE"OYD*BG     4BA/HC &Y@B&#? D  F? <GT HMH %5 J/  HX  J IO E&G /1Y  ',-  L8*C1230065
T+//;DJM'"2UWO D  *@84EDKUSO D*&O4  AH&8ZD% AG(U+ J/  HHAG /O  ( -QZ-O  DH| U&.OAA,OEA@B  GFT4 ;QQC1230066
T+/SROH*Q/C&HFHQ  <ABTOIDO@ &E@AO¬   /1Y'(&DZCXUB ?H  & #D  CMAH&#K J-  4 KU%C&DZ.BUKO D  *6&4 3RDC1230067
T+/TMBKU*HK$  J3  3OH*  C&HF&M<ABT  OID=@ -E@ &¬2/1   4BAUEC &Y@BJM? H  F? UGT -NH >% 1   .T H KQ&C1230068
T+/U|EB-)@Y*&( -  RA&ODH| UO$OBA,O  FA@BGFT6(BA&ZI*   AG|<( KU+HJ.  J3  ROH*  C&HFMU<ABT  OIE8 JA4C1230069
T+/VH? HF? HG(&D  RKRO D&B* AMAOH*  E|E8 DJO@"1G(BA&  ZI* AG|<( KU+HJ.    J3RC-DRKK-JOH*    C& ;$@C1230070
T+/WEBAVIC &Y@BJ  T? HF? -GOH*RET&  HFE&<ABTOIFS@ -E  @ O*5 JWUX  J IO   E&G /1Y',- JE$3  "EQ4 @HOC1230071
T+/X BA&ZI* AG|+  @ AD( KU+HJ.  J3  RC-DRZB-JOH*  C&  HE"O<ABTOIF6@ -E  @  ¬ /1:D( -E  O   DH|  1J8C1230072
T+/X#IGH@ OE@  ¬   /1X)( -E  ODH|   U)#OCA,OBA3MAF-B  * AD X  N *BGFT4  ( KU+HJ.  J3RC-D  E B- 8/ C1230073
T+/Y6D*BG   4BAY   C &Y@BJ@? <F? O  GOH*R7L&HF- <ABT  OIHF@ OE@C&¬ /1X  )( -E|<HA"& 6 K-  |O D 12@C1230074
T+/Z1FTG /O  ( -  $TBOAF?4G.- E" H  % A,4 SO F1HB+-D  $DSOIHJON(&DZCFO  IBJM<L2TSH+<< KU  &H % =#UC1230075
T+/D%C DZDS-.C *  Z$K-.<  Y936AH+$   -K *O*&¬&T--H+L   DA4WO*H$X<BGG#M  11SU<OH*-CTS H+L  2D+  K/4C1230076
T+/,XOH*¬_LGDH&#   /2 ++H Y9|H&3LC  FHJ O1BUKC&DZCBU  &@-GMC&DZCSUKO D  $,,-DA?H&DTYDH+K  '  Q #Q*C1230077
T+/%S@-DH+O&Y9CY  BH+LA A?$OH*¬_¬<    <BGH 88-BTU@/C  CO*H$D*BGF=PA A%  ¬+ HY9|H&4?HGDL-  BH+& *I8C1230078
T+/_)@/ HC  $.J%  KO& $'OOBHKOYL 8  BHKOYC@B-GA¬AO/%  6<<QZDCCDHJH+ SU  %H " YA2QO*&¬&TU  FH+& EC*C1230079
T+/>QOI $LC--H+L   DA4W(&DZCAOIHKQ  IC&DZCBU&O D*83     H+*'-STWOHD-G<B  G   <GSS7IJY<A2S  -IH% PKYC1230080
T+/?L@Y;ICBQY?2L  K@Y; CA@Y>BL2@Y*  <CA@Y>BL2C -YYKL  #@@&B<<MZHC-AHKT  2DG¬ /1M5CD@Y8ST  TCA8 O.%C1230081
T+/O+H.*VF?HG&-O  _H<QVK<BGGKQ<HKT  8IP.2/O@<HBTAIR?  2/OQ<.BTEI*-< KU  %H %9ASTU@/ HC-D  Z.B- EK-C1230082
T+/1IC@ -G |2/OQ  <HBTAI¬DO1SU&<<&  ZDTCEHK-8 KUYOA   *|@BGELM<GSS7I/C   /1M5CD@Y8STTCAD  YDSQ OTMC1230083
T+/2DH-OAHKOZH|H  GH OQH.DW+@BGELM  <HSTCIW$ /1M5CD@  Y8STTCC@Y6BEW|    Z¬&OOHPOZ¬&OAHO*  Z.CD 8&QC1230084
T+/2"12/'<<*ZELO  OHO4: KTUOH*N(*G  DG.M8ABTU@Z ICA*  Y%BE=@Y):CA8Y_2$  )@Y)1CB%Y1B*I@Y)  YCBM PC*C1230085
T+/3:H.8X."HGPOO  ZH<HXO¬HGN-OXH<   X--HLL&O$H.&XX*B  GELM<F2S4I94<BBS  /I:$ /1M5CA%Y_B;  )C - *AYC1230086
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OBJECT CARD LISTING

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

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T+/45HHDX,@BGELM  <F2S4I94<B8S/I#T  /1M5CAUY%S¬K@Y*  HCA<Y,B¬WOH*N(¬|  D T--N+L2D 4( KU  YH % 4 MC1230087
T+/50@-DD<<MZHC-  AHKT DAO*C  )LA,  4O& )O2O GNMD+&  ZI"H8RSO GQ@B+-D  )T@GBGA¬ /1=5<*&  Y&@  &S C1230088
T+/6,/2 +<<&Z. 4  AHKOY&@ AF:88-BT  UOA $T*BGG#P3  ¬  /2 ++H Y9< &F90  < SU%HDO+ SU%H "  YA8 7H*C1230089
T+/7W %GBGE<O1KU  %+ DZ.< &GF-: KT  U+B Y9<B&ELM<L2T  SH+<8DBTUOI )@,4  8A% AGCM'-BVWO D  *(L4 )$ C1230090
T+/8/ SVXO D*(*B  GGJO9EBUY+&@ZI@  &GE# /11M<<MZ.C-  AHK3 DA1YOH**E3&  HG4D<AKSQIH<5 KU  <G U L-8C1230091
T+/9*HKQ1OH*8F%I  &H+.A *BG /DAJKH  KCD@Y8STT.  YV D  <ABS$HI <ASSTH|*  <ABSZH|3 /OH; 1,  'H.  Q88C1230092
T+/:POH*BG-HZHBS  5|<UY><8G /8BH&O  Y?*8G /8&H&8YO%8  G /8HHJOY9@8C /D  AMBTSCD@Y8STT|!U  Y><  E14C1230093
T+/#K/OH; SU&H.7  /OH; SUKH<. /OH  ;BSUWH(¬ /OHE-V  Y8TS H+P2UB. /OH  ;ABUOH=P /OH;ABU  4I * KY8C1230094
T+/@(OH*8FYDSH=P  /OHE-KHUA3-AH+L  ZUE&<L2TSH+| /OH  E-JVS,<8G /DA(K<  1OH*BG-&ZEK>EOH*  8G-& "14C1230095
T+/'HHO4YY@8G /8  DHPDY,<8G /8DHPM  Y_*8G /8DHPUY?%8  C /8DHP4Y1@8G /D  BMBTSOH*  C&HG#&  4 /@ OQ&C1230096
T+/=C%CCEHK-8 KU  Y@/AH(&HZ $MB L-  &HK-8ABTU@/ *.  ¬$&<8 BUX+ HY9|H  &HBO G:OE+OHY9|H  GBCO 7E%C1230097
T+/==AA=%+O&Y9BO  G9DD+& ZI3UHHKT  2D @:DBTU+S Y9||  D¬%8GG:73( CB -  OH*  C&HG"U4 K  I( H Q,UC1230098
T+/"9H M5 J"9L&  F???  &$K &|2/O_  (  EX?HAA'HAAC&  AH 4#-BTUC <Z.  CC < 1"'(&D-B*B  G  5M8C1230099
T+S 4OH*¬"TD H+L  B - O-D <8G  4BB $C < 2U%OH*  C&HHGD8 &H(@ZA  G D-EL&BHF4<F Y  9B/- :C8C1230100
T+SA?C&DHGSAP@-D  IC&E KAP@YD$OH*  BFUQLHE?A <BG SY  DCAX /OHEJ/D/?<D  OH)  %:A CB -  OH* P 4C1230101
T+SBD  4BBB6( D  -,T&8H.H( &Y*HH$  2 &U( OOAHH$2-J¬  /OHEJ/</W<D CA-  H+&YQOH*8H-&<E@B  G$ H 2H4C1230102
T+SCVO-D <H8 C  /O ( -/.L&AHKM  4 SDZOH*/.%HAHD4  @ B//+H HF¬H&ACO  DHFD* KU% LGEHK3  K &H QDHC1230103
T+SD-¬¬@ O D-6-G  AHKOYC3CEHK-8 KU  Y@Z HC-DZ.B-|OB  -@@HA9¬Q6 K-|OB  /CC&EHG%11K/;C¬@  /GBD *&<C1230104
T+SE$G<HA CB -  OH* C&HHQM4 KF  AO-DY¬TGEHF*11K/  Z<*MYE3GEHF4@ B/  ><*MY$3GEHG<* B/  > CD =C C1230105
T+SFO1K/7G Y* D  11K/1<*MY)LGEHG*  11K/94-DB¬¬@ O D  /K%HA C /O 4'$  A1<XN14CS1*|T2|$  N&<< NOUC1230106
T+SGJ@¬¬L5%GD2|P  G&+.EO=||I5_N O"G  98%PC8@XO5MCC@¬V  6*PA1+TI5;PA4@X  D&+.E8=||I5*) 5%R  8_M 6R<C1230107
T+SH<8UCS9>I @¬E  -@¬I 5_V @*E-@*I  .6*PC5>PE6*PD&<G  F8@PR&+) 6*PT6*X  E8%|A5P7T&(XE8>|  A6;< ;L8C1230108
```


OBJECT CARD LISTING

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

```
T+SIG&(LIO*XO5*X  OO@PS8_$R&FA 8@P  S8@XN14CT1|XM2|P  A8&PD&(¬E6)LA5*P  N84CE6)V QDCR1;|  R:D "*$@C1230109
T+SHB1%GI4@PD1(X  V&<|M1DA &<|Y,4A  &DA 2<J &DA 8%X  O&DA &+.N8UA &DA  1<LC6MCD1<LR&<$  FO@< ¬94C1230110
T+SH*O@|H2<TH6|X  K4@LL1(|N5)XE0*J  1<XA1'PO8>|I04C  S1)PS1MCDO;|A8%P  L1*|T&<LR2;PE&+|  O&<H ¬80C1230111
T+S.81MCX9=¬X9=¬  X9=¬X9=¬X94A 8_P  S&+.W8UC10OC1OUC  S1)|EO=( 1(X)9*P  S&|E-@UCR1:.P1*|  T2;M =3HC1230112
T+S<31)|YK*C0QFA  -Q|C3&|C4QFA-Q|C  7&|C8QFA-Q|G1&|G  2QFA-Q|G5&|G6QFA  -Q|G9&|.0QFA-Q|.  31)U O8@C1230113
T+S(>6)$R&<|O1<N  QFA-QFA-QFA-QFA  -QFA O<|X9@LR2;P  E&<|H1*|K8UCS8@G  19+I QFA-QFA-&+¬  X1(& )O C1230114
T+S+2&+.E6+LE5*|  E&<|O5;|R5_( QFA  -QFA-6+¬X4'$A1DC  S9%XTO@/ 8>|A8=L  S&FA-QFA-QFA 9=¬  AO@< 19MC1230115
T+S|U1;.S&<|O5;|  R5_( 8>|A8=LS&FA  -QFA 9=¬E9'¬E0=|  E1DCR1;.I1+LA44C  D1<LF&DA &+¬X9=¬  X9=* 12YC1230116
Y+S&¬9@GC8=LA44A  &(XE8%XD9<GL&<L  D1<R &DA 9=¬X9=¬  X9=¬O@|A/@|CO6*P  CO:|S1*PK&|XD2<G  E6*& 2H8C1230117
T+SH.2)$O@UA-&<L  DO*V 1<XD&(PO84C  L5%GDE<|O6)XF0=|  L:|C3&FA 1<LD6¬C  4&FA 8%XO&<TU5*)  21M O,@C1230121
T+SNF&(XE4*PC8@X  O5MCL5_$P@|N QDC  D6;N 5)$T&(XD:DC  O6MCU5*XT&<|K&FC  T2)R-&(¬R2)$R&+|  D&+H L1UC1230122
T+SOA2)$O'UA-&+.  I5UCD2*J 5)$T&+.  E84CA8=|AO@TM1)P  Y&<.U8>/ Q+|I5WC  O'4A-&+.E1)I O'L  D&<& EA C1230123
T+SO@2*J 5)$T&+.  E84CS1*PK&<.U8>/  Q+|I5WCO=DA-&+.  E1)I O>LS:DA-8@X  OQDCW2:|M&(PO&+.  E1)H 8K@C1230124
T+SP7&<XN&(¬R5%¬  R1:.S@|V QDCA8=|  AO@TM1)PT&<.U8>/  Q+|I5WA 1<XD&(P  O84CG5UCO1%$OOMA  -&+& @JDC1230125
T+SQ25*XT&<|H1*|  K&($R&(POQ($P&+.  TO:|U8?CC&FA O*L  A5=|E6MCC2<PC47C  D&FA 9(PE9'¬E0=|  E1D &Q-C1230126
T+SR_2)PT1)XR9(¬  T@<N QDCI5:|E6)X  U5=( 9%XT2DCN5UC  I5:|E6)XU5=( O%X  T&<XN&+.N8?CF&FA  O*& 11OC1230127
T+SEYO)¬T1)V O'I  5_N 6*J 1<XA14C  S5;I O*$T1)V 1(X  V&+LN2;( O'I 5_V  5)R-S_) 8>|A8=L  S@¬ M1YC1230128
T+S$T&FA 5)R 5_)  1)PD&<XN8@PR6:L  P8"G1&FA 5)R 8%P  E4UCC5_LP4@PT1MC  I5:|E6)XU5=|1@UA  -&<Q 3J-C1230129
T+S*;O)|S1MCI5;|  E6)XU5=( 5@PN1<X  N1¬A-8@XOQDCC5_P  D2;|I5_P1@4A-&<P  X5@PC8@PD&+.CO)N  1)- 3EYC1230130
```

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+S)R9<GL&<LI1DC	N5>(5%|C9(X1*DA	-&<PX5@PC8@PD&+.	CO)N 2<XT&FCT2)R	-&<LI1DCN5>(5%|	C9(U :8UC1230131
T+S;M@¬N QDCU5*P	X5@PC8@PD&+.CO)N	2<XT&FCT2)R-&<|	O5*LI8@XO5¬G6&FA	1<LD6MCR1;.I1+L	A44 8HDC1230132
T+S¬|Z)PC5_XR1*|	T@¬} QDCD1<|R@¬/	QDCD1<|F@¬V QDC	D1<LF@*E QDCU5*P	X5@PC8@PD&+.CO)N	1)- $SQC1230133
T+S-H9<GL@?A QDC	W6*XT1MCI5*TIO%X	T1*LE6)V @?C394A	-&(XEO*J 2)¬L&<$	A2)|U6*M	#QYC1230134
T.S-9 |D D -	C & E B	H A& M & AP&H	AH@|*|=======7)	7=:Y	9D8C1230135
T+S/8 |Y BVHHCU	,EB_8=W - B,@	.-=.C--+S H-B&	C 8 - +=8-BW H	Y - H Y 6OD< O	BCOH ¬9<C1230136
TFKSKC*-I H_-B4	.O 3 BM H8@T B;	IO = |@			*1@C1230137
T STV					5D-C1230138
TDSU=	C1O S &				"E&C1230139
TAKVN |.HAD -					@D4C1230140
T+SW8-Y|?=O H+	C9=@ F BD-=|= A&	/Q|/=O & HEC8|@	DOBG-;C= /H SHF	-=O K HWAH|@ M-B	H-& N9*C1230141
T+SX3=OCK H>A |@	@-BQ-=:=A B WQ|	=PO& HIDC=4@D AB	$ =:|/ X |=LO&	HFC=="@H BJ-=7	=C ¬TMC1230142
T+SY> IHC:¬@<B-B	L-¬P=C-H VHGV=OO	B IOA9¬@<D- Q-==	=D BQ|==1& W	C==@Q J-:==G	DY< JE*C1230143
T+SZZ7¬@*H L-@7	=GCH EH|E=1OS AO	CO¬@*H- O @G=XB8	EO|A=OO> WC==@	- I-===I BQ|	==2- K/HC1230144
T+SDU /-:==.	HY|P=20- B+C4=@	&H U-:.=.BO IY|	K=20_ SC==@O	I-===(BQ|==3-	CD 73&C1230145
T+S,¬-:==| <Y|	P=30- C+C4=@@H	4-:.=|BO (Q|K=30	_ WC==: I-==	=J BQ|==4- DF	C=¬@ OA&C1230146
T+S&EL &Y|5=40	H D+C9¬:< -AD-=P	=LAH BY!==5 W	C==:M I-===O	MQ|:=50 EHC=|:	* O 2ODC1230147
T+S_NM8|@=5OB FH	C¬=:- A--7==QH	QQ|==6& FFC==	Y A/-===$ BQ|	==7 WC==:4	I-=@ RHDC1230148
TDK_X=7- GFC=¬:	@ A2-=7=¬ H				O$UC1230149
E==:*E7*=¬DC=PH$	=7M&F| | C	F& ASC R A	SO Q	09380630750	81376=#YC1230150

LAST PAGE

DATE	23AUG75	05NOV75	19MAR76	010CT76
EC NO.	827785	827827	827872	571931

C1F3 3340 SYSTEM TEST MODULE -- MOD 12

LAST CHG: 07/16/76

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                           2 *
                           3          DECK  1
                           4          SEQ   0
                           5          TREP
                           6 *
0000                       7 C1F      START 0
                           8 ********************************************************************************
                           9 *                                                                              *
                          10 *                          SECTION PREFACE                                     *
                          11 *                                                                              *
                          12 ********************************************************************************
                          13 *
                          14          ORG   X'0A00'
0A00                      15 *
0A00 C1F3          0A01   16 PID      DC    XL2'C1F3'        SECTION ID AND REVISION LEVEL
0A02 40            0A02   17          DC    XL1'40'          SECTION FLAGS
0A03 01            0A03   18 RTN      DC    XL1'01'          CURRENT ROUTINE NUMBER
0A04 0000          0A05   19          DC    AL2(0)
0A06 0A0D          0A07   20 PFC      DC    AL2(RTNPFC)      ADDRESS OF ROUTINE PREFACE
0A08 17E0          0A09   21          DC    AL2(ERRLOG)      ERROR LOG ADDRESS
                          22 *
0A0A C15000        0A0C   23 UDT0     DC    XL3'C15000'      3340 UDT
                          24 *
```


C1F3 3340 SYSTEM TEST MODULE -- MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                          18E5  26          USING DRVWK,XR2       INDEX REG 2 POINTS TO DRV WORK AREA
                          27 ********************************************************************************
                          28 *                                                                              *
                          29 *                ROUTINE 01 - READ STATUS COMMANDS TEST                        *
                          30 *                                                                              *
                          31 ********************************************************************************
                          32 *
0A0D 01                   0A0D  33 RTNPFC    DC    XL1'01'          ROUTINE NUMBER
0A0E 00                   0A0E  34           DC    XL1'00'          ROUTINE FLAGS
0A0F FFFF                 0A10  35           DC    XL2'FFFF'        OPERATES AS ONE ROUTINE
                                36 *
0A11 3B 80 18AF                 37           SBF   IND,BGNSW        RESET PROGRAM RESTART INDICATOR
                                38 *
0A15 3C 0A 18B2                 39 R01       MVI   LPCNT,10         LOOP THIS ROUTINE 10 TIMES
                                40 *
0A19 C0 87 0F6A                 41           B     BEGIN            PERFORM ROUTINE INITIALIZATION
0A1D 0A25                 0A1E  42           DC    AL2(R01A)        'LOOP' SUBROUTINE RETURN ADDRESS
0A1F 0A3D                 0A20  43           DC    AL2(R01B)        'NXDRV' SUBROUTINE RETURN ADDRESS
                                44 *
0A21 C0 87 1072                 45           B     RECAL            RECALIBRATE
                                46 *
0A25 C0 87 1272                 47 R01A      B     RDSNS            READ DIAGNOSTIC SENSE DATA
0A29 C0 87 1260                 48           B     RDLOG            READ AND RESET BUFFERED LOG
                                49 *
0A2D 3A 01 18C6                 50           SBN   IDDDR,1          START DDDF ON ODD STORAGE ADDRESS
                                51 *
0A31 C0 87 1272                 52           B     RDSNS            READ DIAGNOSTIC SENSE DATA
0A35 C0 87 1260                 53           B     RDLOG            READ AND RESET BUFFERED LOG
                                54 *
0A39 C0 87 1013                 55           B     NXDRV            REPEAT FOR EACH DRIVE BEING TESTED
                                56 *
0A3D 0F 00 18B2 187E            57 R01B      SLC   LPCNT(1),P1      DECREMENT LOOP COUNTER
0A43 C0 01 1058                 58           BNZ   LOOP             REPEAT TEST 10 TIMES
                                59 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           61 ********************************************************************************
                           62 *                                                                              *
                           63 *                ROUTINE 02 - CYLINDER ZERO ACCESS TEST                        *
                           64 *                                                                              *
                           65 ********************************************************************************
                           66 *
 0A47 3C 00 0A63           67 R02      MVI   R02A1,0          INITIALIZE HEAD ADDR TO 0
                           68 *
 0A4B C0 87 0F6A           69          B     BEGIN            PERFORM ROUTINE INITIALIZATION
 0A4F 0A53           0A50  70          DC    AL2(R02A)        'LOOP' SUBROUTINE RETURN ADDRESS
 0A51 0A6E           0A52  71          DC    AL2(R02B)        'NXDRV' SUBROUTINE RETURN ADDRESS
                           72 *
 0A53 C0 87 1072           73 R02A     B     RECAL            RECALIBRATE
 0A57 C0 87 1272           74          B     RDSNS            DETERMINE DATA MODULE SIZE
 0A5B C0 87 110F           75          B     RDHAE            READ HOME ADDR AND R0 COUNT EVEN
                           76 *
 0A5F C0 87 1084           77          B     SEEK             SEEK
 0A63                0A63  78 R02A1    DS    IL1              PHYSICAL HEAD ADDRESS
 0A64 0000           0A65  79          DC    IL2'0'           PHYSICAL CYLINDER ADDRESS
                           80 *
 0A66 C0 87 110F           81          B     RDHAE            READ HOME ADDR AND R0 COUNT EVEN
                           82 *
 0A6A C0 87 1013           83          B     NXDRV            REPEAT FOR EACH DRIVE BEING TESTED
                           84 *
 0A6E 0E 00 0A63 187E      85 R02B     ALC   R02A1(1),P1      INCREMENT HEAD ADDRESS
                           86 *
 0A74 3D 0C 0A63           87          CLI   R02A1,12         LOOP UNTIL ALL HEADS
 0A78 C0 82 1058           88          BL    LOOP               HAVE BEEN TESTED
                           89 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           91 ********************************************************************************
                           92 *                                                                              *
                           93 *                ROUTINE 03 - CE CYLINDER ACCESS TEST                          *
                           94 *                                                                              *
                           95 ********************************************************************************
                           96 *
 0A7C 3C 00 0A94           97 R03      MVI   R03A1,0          INITIALIZE HEAD ADDR TO 0
                           98 *
 0A80 C0 87 0F6A           99          B     BEGIN            PERFORM ROUTINE INITIALIZATION
 0A84 0A88           0A85 100          DC    AL2(R03A)        'LOOP' SUBROUTINE RETURN ADDRESS
 0A86 0A9F           0A87 101          DC    AL2(R03B)        'NXDRV' SUBROUTINE RETURN ADDRESS
                          102 *
 0A88 C0 87 1072          103 R03A     B     RECAL            RECALIBRATE
 0A8C C0 87 1272          104          B     RDSNS            DETERMINE DATA MODULE SIZE
                          105 *
 0A90 C0 87 1084          106          B     SEEK             SEEK (3340 PHYSICAL ADDRESS)
 0A94                0A94 107 R03A1    DS    IL1                HEAD 0 - 11
 0A95 015D           0A96 108          DC    IL2'349'           CYLINDER 349
                          109 *
 0A97 C0 87 110F          110          B     RDHAE            READ HOME ADDR AND R0 COUNT EVEN
                          111 *
 0A9B C0 87 1013          112          B     NXDRV            REPEAT FOR EACH DRIVE BEING TESTED
                          113 *
 0A9F 0E 00 0A94 187E     114 R03B     ALC   R03A1(1),P1      INCREMENT HEAD ADDRESS
                          115 *
 0AA5 3D 0C 0A94          116          CLI   R03A1,12         LOOP UNTIL ALL HEADS
 0AA9 C0 82 1058          117          BL    LOOP               HAVE BEEN TESTED
                          118 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              120 ********************************************************************************
                              121 *                                                                              *
                              122 *              ROUTINE 04 - CYLINDER ZERO READ DATA TRANSFER TEST              *
                              123 *                                                                              *
                              124 ********************************************************************************
                              125 *
  0AAD 3C 00 0AC5             126 R04      MVI   R04B1,0           INITIALIZE HEAD ADDR TO 0
                              127 *
  0AB1 C0 87 0F6A             128          B     BEGIN             PERFORM ROUTINE INITIALIZATION
  0AB5 0AC1          0AB6     129          DC    AL2(R04B)         'LOOP' SUBROUTINE RETURN ADDRESS
  0AB7 0AE5          0AB8     130          DC    AL2(R04C)         'NXDRV' SUBROUTINE RETURN ADDRESS
                              131 *
  0AB9 C0 87 1072             132 R04A     B     RECAL             RECALIBRATE
  0ABD C0 87 1272             133          B     RDSNS             DETERMINE DATA MODULE SIZE
                              134 *
  0AC1 C0 87 1084             135 R04B     B     SEEK              SEEK (3340 PHYSICAL ADDRESS)
  0AC5                 0AC5   136 R04B1    DS    IL1                 HEAD 0 - 11
  0AC6 0000            0AC7   137          DC    IL2'0'              CYLINDER 0
                              138 *
  0AC8 C0 87 110F             139          B     RDHAE             READ HOME ADDR AND R0 COUNT EVEN
                              140 *
  0ACC C0 87 1191             141          B     RDCKD             READ COUNT-KEY-DATA
  0AD0 00              0AD0   142          DC    IL1'0'              RECORD 0 (EVEN)
                              143 *
  0AD1 3A 01 18C4             144          SBN   IDDCR,1           CHECK AGAIN USING
  0AD5 3A 01 18C6             145          SBN   IDDDR,1             ODD STORAGE ADDRESSES
                              146 *
  0AD9 C0 87 111C             147          B     RDHAO             READ HOME ADDR AND R0 COUNT ODD
  0ADD C0 87 1155             148          B     RDR0O             READ KEY-DATA RECORD 0 ODD
                              149 *
  0AE1 C0 87 1013             150          B     NXDRV             REPEAT FOR EACH DRIVE BEING TESTED
                              151 *
  0AE5 0E 00 0AC5 187E        152 R04C     ALC   R04B1(1),P1       INCREMENT HEAD ADDRESS
                              153 *
  0AEB 3D 0C 0AC5             154          CLI   R04B1,12          LOOP UNTIL ALL HEADS
  0AEF C0 82 1058             155          BL    LOOP                HAVE BEEN TESTED
                              156 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              158 ********************************************************************************
                              159 *                                                                              *
                              160 *              ROUTINE 05 - CE CYLINDER READ DATA TRANSFER TEST                *
                              161 *                                                                              *
                              162 ********************************************************************************
                              163 *
  0AF3 3C 00 0B0B             164 R05      MVI   R05B1,0           INITIALIZE HEAD ADDR TO 0
                              165 *
  0AF7 C0 87 0F6A             166          B     BEGIN             PERFORM ROUTINE INITIALIZATION
  0AFB 0B07          0AFC     167          DC    AL2(R05B)         'LOOP' SUBROUTINE RETURN ADDRESS
  0AFD 0B4F          0AFE     168          DC    AL2(R05C)         'NXDRV' SUBROUTINE RETURN ADDRESS
                              169 *
  0AFF C0 87 1072             170 R05A     B     RECAL             RECALIBRATE
  0B03 C0 87 1272             171          B     RDSNS             DETERMINE DATA MODULE SIZE
                              172 *
  0B07 C0 87 1084             173 R05B     B     SEEK              SEEK (3340 PHYSICAL ADDRESS)
  0B0B                 0B0B   174 R05B1    DS    IL1                 HEAD 0 - 11
  0B0C 015D            0B0D   175          DC    IL2'349'            CYLINDER 349
                              176 *
  0B0E C0 87 110F             177 R05B2    B     RDHAE             READ HOME ADDR AND R0 COUNT EVEN
                              178 *
  0B12 C0 87 1191             179          B     RDCKD             READ COUNT-KEY-DATA
  0B16 00              0B16   180          DC    IL1'0'              RECORD 0 (EVEN)
                              181 *
  0B17 C0 87 1191             182          B     RDCKD             READ COUNT-KEY-DATA
  0B1B 01              0B1B   183          DC    IL1'1'              RECORD 1
                              184 *
  0B1C 8D 02 13 1890          185          CLC   DL(3,XR2),P256    GO TO ERROR END IF
  0B21 C0 01 161E             186          BNE   ERR18               RESIDUAL KL/DL INCORRECT
                              187 *
  0B25 35 01 18C6             188          L     IDDDR,XR1         POINT TO RESIDUAL DDDF
                              189 *
  0B29 4D 03 03 189C          190 R05B3    CLC   3(4,XR1),WCPTN    GO TO ERROR END IF
  0B2E C0 01 1626             191          BNE   ERR19               RESIDUAL DDDF IS INCORRECT
                              192 *
  0B32 D2 01 04               193          LA    4(,XR1),XR1       LOOP UNTIL                          03
  0B35 0F 01 18CD 1882        194          SLC   RDDCF+8(2),P4       ALL OF RESIDUAL DDDF              03
  0B3B C0 01 0B29             195          BNZ   R05B3                 HAS BEEN CHECKED                03
                              196 *
  0B3F 38 01 18C6             197          TBN   IDDDR,1           READ AND CHECK
  0B43 3A 01 18C6             198          SBN   IDDDR,1             RECORD 1 AGAIN
  0B47 C0 90 0B0E             199          BF    RC5B2                 USING ODD STORAGE ADDRESS
                              200 *
  0B4B C0 87 1013             201          B     NXDRV             REPEAT FOR EACH DRIVE BEING TESTED
                              202 *
  0B4F 0E 00 0B0B 187E        203 R05C     ALC   R05B1(1),P1       INCREMENT HEAD ADDRESS
                              204 *
  0B55 3D 0C 0B0B             205          CLI   R05B1,12          LOOP UNTIL ALL HEADS
  0B59 C0 82 1058             206          BL    LOOP                HAVE BEEN TESTED
                              207 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          209 ********************************************************************************
                          210 *
                          211 *              ROUTINE 06 - WRITE DATA TRANSFER TEST                           *
                          212 *                                                                              *
                          213 ********************************************************************************
                          214 *
 0B5D 3C 0A 18B2          215 R06      MVI   LPCNT,10          LOOP THIS TEST 10 TIMES
                          216 *
 0B61 C0 87 0F6A          217          B     BEGIN             PERFORM ROUTINE INITIALIZATION
 0B65 0B78          0B66  218          DC    AL2(R06B)         'LOOP' SUBROUTINE RETURN ADDRESS
 0B67 0BC6          0B68  219          DC    AL2(R06C)         'NXDRV' SUBROUTINE RETURN ADDRESS
                          220 *
 0B69 C0 87 1072          221 R06A     B     RECAL             RECALIBRATE
 0B6D C0 87 1272          222          B     RDSNS             DETERMINE DATA MODULE SIZE
                          223 *
 0B71 C0 87 1084          224          B     SEEK              SEEK (3340 PHYSICAL ADDRESS)
 0B75 00            0B75  225          DC    IL1'0'              HEAD 0
 0B76 015D          0B77  226          DC    IL2'349'            CYLINDER 349
                          227 *
 0B78 B8 08 00            228 R06B     TBN   DIND(,XR2),NOWR    BYBASS DRIVE IF                          02
 0B7B C0 10 1013          229          BT    NXDRV               WRITE INHIBITED                          02
                          230 *                                                                            02
 0B7F C0 87 110F          231          B     RDHAE             READ HOME ADDR AND RO COUNT EVEN           02
                          232 *
 0B83 C0 87 1191          233 R06B1    B     RDCKD             READ COUNT-KEY-DATA
 0B87 01            0B87  234          DC    IL1'1'              RECORD 1
                          235 *
 0B88 C0 87 12F9          236          B     WRCKD             WRITE COUNT-KEY-DATA
 0B8C 02            0B8C  237          DC    IL1'2'              RECORD 2
 0B8D 00            0B8D  238          DC    IL1'0'              NN = 00
                          239 *
 0B8E C0 87 1191          240          B     RDCKD             READ COUNT-KEY-DATA
 0B92 02            0B92  241          DC    IL1'2'              RECORD 2
                          242 *
 0B93 8D 02 13 1890       243          CLC   DL(3,XR2),P256    GO TO ERROR END IF
 0B98 C0 01 161E          244          BNE   ERR18               RESIDUAL KL/DL INCORRECT
                          245 *
 0B9C 35 01 18C6          246          L     IDDDR,XR1         POINT TO RESIDUAL DDDF
                          247 *
 0BA0 4D 03 03 189C       248 R06B2    CLC   3(4,XR1),WCPTN    GO TO ERROR END IF
 0BA5 C0 01 1626          249          BNE   ERR19               RESIDUAL DDDF IS INCORRECT
                          250 *
 0BA9 D2 01 04            251          LA    4(,XR1),XR1       LOOP UNTIL                               03
 0BAC 0F 01 18DD 1882     252          SLC   RDDCF+8(2),P4       ALL OF RESIDUAL DDDF                     03
 0BB2 C0 01 0BA0          253          BNZ   R06B2               HAS BEEN CHECKED                         03
                          254 *
 0BB6 38 01 18C6          255          TBN   IDDDR,1           WRITE AND CHECK
 0BBA 3A 01 18C6          256          SBN   IDDDR,1             RECORD 2 AGAIN
 0BBE C0 90 0B78          257          BF    R06B                  USING ODD STORAGE ADDRESS
                          258 *
 0BC2 C0 87 1013          259          B     NXDRV             REPEAT FOR EACH DRIVE BEING TESTED
                          260 *
 0BC6 0F 00 18B2 187E     261 R06C     SLC   LPCNT(1),P1       LOOP THIS TEST 10 TIMES
 0BCC C0 01 1058          262          BNZ   LOOP
                          263 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          265 ********************************************************************************
                          266 *
                          267 *              ROUTINE 07 - WRITE HOME ADDRESS TEST                            *
                          268 *                                                                              *
                          269 ********************************************************************************
                          270 *
 0BD0 C0 87 0F6A          271 R07      B     BEGIN             PERFORM ROUTINE INITIALIZATION
 0BD4 0BE0          0BD5  272          DC    AL2(R07A)         'LOOP' SUBROUTINE RETURN ADDRESS
 0BD6 0BFE          0BD7  273          DC    AL2(R08)          'NXDRV' SUBROUTINE RETURN ADDRESS
                          274 *
 0BD8 C0 87 1072          275          B     RECAL             RECALIBRATE                              02
 0BDC C0 87 1272          276          B     RDSNS             DETERMINE DATA MODULE SIZE               02
                          277 *                                                                            02
 0BE0 B8 08 00            278 R07A     TBN   DIND(,XR2),NOWR   BYBASS DRIVE IF                          02
 0BE3 C0 10 1013          279          BT    NXDRV               WRITE INHIBITED                          02
                          280 *                                                                            02
 0BE7 C0 87 1084          281          B     SEEK              SEEK (3340 PHYSICAL ADDRESS)
 0BEB 00            0BEB  282          DC    IL1'0'              HEAD 0
 0BEC 015D          0BED  283          DC    IL2'349'            CYLINDER 349
                          284 *
 0BEE C0 87 110F          285          B     RDHAE             READ HOME ADDR AND RO COUNT EVEN
                          286 *
 0BF2 C0 87 1289          287          B     WRHAO             WRITE HA AND RO ODD
 0BF6 C0 87 111C          288          B     RDHAO             READ HA AND RO COUNT ODD
                          289 *
 0BFA C0 87 1013          290          B     NXDRV             REPEAT FOR EACH DRIVE BEING TESTED
                          291 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          293 ********************************************************************************
                          294 *                                                                              *
                          295 *                ROUTINE 08 - HEAD WRITE/READ TEST                             *
                          296 *                                                                              *
                          297 ********************************************************************************
                          298 *
 0BFE 3C 00 0C1D          299 R08      MVI   R08B1,0             INITIALIZE HEAD ADDR TO ZERO
                          300 *
 0C02 C0 87 0F6A          301          B     BEGIN               PERFORM ROUTINE INITIALIZATION
 0C06 0C12          0C07  302          DC    AL2(R08B)           'LOOP' SUBROUTINE RETURN ADDRESS
 0C08 0C6B          0C09  303          DC    AL2(R08C)           'NXDRV' SUBROUTINE RETURN ADDRESS
                          304 *
 0C0A C0 87 1072          305 R08A     B     RECAL               RECALIBRATE
 0C0E C0 87 1272          306          B     RDSNS               DETERMINE DATA MODULE SIZE
                          307 *                                                                          02
 0C12 B8 08 00            308 R08B     TBN   DIND(,XR2),NOWR     BYBASS DRIVE IF                      02
 0C15 C0 10 1013          309          BT    NXDRV                 WRITE INHIBITED                    02
                          310 *
 0C19 C0 87 10E4          311          B     SEEK                SEEK (3340 PHYSICAL ADDRESS)         02
 0C1D               0C1D  312 R08B1    DS    IL1                   HEAD 0 - 11
 0C1E 015D          0C1F  313          DC    IL2'349'              CYLINDER 349
                          314 *
 0C20 C0 87 110F          315          B     RDHAE               READ HOME ADDR AND RO COUNT EVEN
                          316 *
 0C24 C0 87 12D4          317          B     WRR00               WRITE RECORD ZERO CNT-KEY-DATA ODD
                          318 *
 0C28 C0 87 1191          319 R08B2    B     RDCKD               READ COUNT-KEY-DATA
 0C2C 01            0C2C  320          DC    IL1'1'                RECORD 1
                          321 *
 0C2D C0 87 12F9          322          B     WRCKD               WRITE COUNT-KEY-DATA
 0C31 02            0C31  323          DC    IL1'2'                RECORD 2
 0C32 14            0C32  324          DC    IL1'20'               NN = 20
                          325 *
 0C33 C0 87 1191          326          B     RDCKD               READ COUNT-KEY-DATA
 0C37 15            0C37  327          DC    IL1'21'               RECORD 21
                          328 *
 0C38 8D 02 13 1890       329          CLC   DL(3,XR2),P256      GO TO ERROR END IF
 0C3D C0 01 161E          330          BNE   ERR18                 RESIDUAL KL/DL INCORRECT
                          331 *
 0C41 35 01 18C6          332          L     IDDDR,XR1           POINT TO RESIDUAL DDDF
                          333 *
 0C45 4D 03 03 189C       334 R08B3    CLC   3(4,XR1),WCPTN      GO TO ERROR END IF
 0C4A C0 01 1626          335          BNE   ERR19                 RESIDUAL DDDF IS INCORRECT
                          336 *
 0C4E D2 01 04            337          LA    4(,XR1),XR1         LOOP UNTIL                           03
 0C51 0F 01 18DD 1882     338          SLC   RDDCF+8(2),P4         ALL OF RESIDUAL DDDF               03
 0C57 C0 01 0C45          339          BNZ   R08B3                   HAS BEEN CHECKED                 03
                          340 *
 0C5B 38 01 18C6          341          TBN   IDDDR,1             WRITE AND CHECK
 0C5F 3A 01 18C6          342          SBN   IDDDR,1               RECORD 21 AGAIN
 0C63 C0 90 0C28          343          BF    R08B2                   USING ODD STORAGE ADDRESS
                          344 *
 0C67 C0 87 1013          345          B     NXDRV               REPEAT FOR EACH DRIVE BEING TESTED
                          346 *
 0C6B 0E 00 0C1D 187E     347 R08C     ALC   R08B1(1),P1         INCREMENT HEAD ADDRESS
                          348 *
 0C71 3D 0B 0C1D          349          CLI   R08B1,11            LOOP UNTIL ALL
 0C75 C0 04 1058          350          BNH   LOOP                  HEADS HAVE BEEN TESTED
                          351 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          353 ********************************************************************************
                          354 *                                                                              *
                          355 *                ROUTINE 09 - WRITE KEY-DATA TEST                              *
                          356 *                                                                              *
                          357 ********************************************************************************
                          358 *                                                                          03
 0C79 3C 00 0C91          359 R09      MVI   R09B1,0             INITIALIZE HEAD ADDR TO ZERO         03
                          360 *                                                                          03
 0C7D C0 87 0F6A          361          B     BEGIN               PERFORM ROUTINE INITIALIZATION       03
 0C81 0C8D          0C82  362          DC    AL2(R09B)           'LOOP' SUBROUTINE RETURN ADDRESS     03
 0C83 0CBB          0C84  363          DC    AL2(R09C)           'NXDRV' SUBROUTINE RETURN ADDRESS    03
                          364 *                                                                          03
 0C85 C0 87 1072          365 R09A     B     RECAL               RECALIBRATE                          03
 0C89 C0 87 1272          366          B     RDSNS               DETERMINE DATA MODULE SIZE           03
                          367 *                                                                          03
 0C8D C0 87 1084          368 R09B     B     SEEK                SEEK (3340 PHYSICAL ADDRESS)         03
 0C91               0C91  369 R09B1    DS    IL1                   HEAD 0 - 11                        03
 0C92 015D          0C93  370          DC    IL2'349'              CYLINDER 349                       03
                          371 *                                                                          03
 0C94 C0 87 1191          372          B     RDCKD               READ COUNT-KEY-DATA                  03
 0C98 01            0C98  373          DC    IL1'1'                RECORD 1                           03
                          374 *                                                                          03
 0C99 C0 87 12F9          375          B     WRCKD               WRITE COUNT-KEY-DATA                 03
 0C9D 02            0C9D  376          DC    IL1'2'                RECORD 2                           03
 0C9E 26            0C9E  377          DC    IL1'38'               NN = 38                            03
                          378 *                                                                          03
 0C9F 0E 01 18C6 1890     379          ALC   IDDDR(2),P256       POINT INIT DDDR TO RECORD 2          03
                          380 *                                                                          03
 0CA5 C0 87 137C          381          B     WRKD                WRITE KEY DATA                       03
 0CA9 02            0CA9  382          DC    IL1'2'                RECORD 2                           03
 0CAA 26            0CAA  383          DC    IL1'38'               NN = 38                            03
                          384 *                                                                          03
 0CAB 0F 01 18C6 1890     385          SLC   IDDDR(2),P256       POINT INIT DDDR TO RECORD 1          03
                          386 *                                                                          03
 0CB1 C0 87 1218          387          B     RDVKD               READ VERIFY KEY DATA                 03
 0CB5 01            0CB5  388          DC    IL1'1'                RECORD 1                           03
 0CB6 27            0CB6  389          DC    IL1'39'               NN = 39                            03
                          390 *                                                                          03
 0CB7 C0 87 1013          391          B     NXDRV               REPEAT FOR EACH DRIVE TESTED         03
                          392 *                                                                          03
 0CBB 0E 00 0C91 187E     393 R09C     ALC   R09B1(1),P1         INCREMENT HEAD ADDRESS               03
                          394 *                                                                          03
 0CC1 3D 0B 0C91          395          CLI   R09B1,11            LOOP UNTIL ALL                       03
 0CC5 C0 04 1058          396          BNH   LOOP                  HEADS HAVE BEEN TESTED             03
                          397 *                                                                          03
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          399 ********************************************************************************
                          400 *                                                                              *
                          401 *              ROUTINE 0A - SCAN FF DETECT TEST                                *
                          402 *                                                                              *
                          403 ********************************************************************************
                          404 *
 0CC9 0C 03 18A0 189C     405 ROA      MVC   PATRN+3(4),WCPTN    INITIALIZE
 0CCF 3C FE 189E          406          MVI   PATRN+1,X'FE'         TEST PATTERN
                          407 *
 0CD3 C0 87 0F6A          408          B     BEGIN               PERFORM ROUTINE INITIALIZATION
 0CD7 0CEA          0CD8  409          DC    AL2(ROAB)           'LOOP' SUBROUTINE RETURN ADDRESS
 0CD9 0D5A          0CDA  410          DC    AL2(ROAC)           'NXDRV' SUBROUTINE RETURN ADDRESS
                          411 *
 0CDB C0 87 1072          412 ROAA     B     RECAL               RECALIBRATE
 0CDF C0 87 1272          413          B     RDSNS               DETERMINE DATA MODULE SIZE
                          414 *
 0CE3 C0 87 1084          415          B     SEEK                SEEK (3340 PHYSICAL ADDRESS)
 0CE7 00            0CE7  416          DC    IL1'0'                HEAD 0
 0CE8 015D          0CE9  417          DC    IL2'349'              CE CYLINDER
                          418 *
 0CEA C0 87 110F          419 ROAB     B     RDHAE               READ HOME ADDR AND R0 COUNT EVEN
                          420 *
 0CEE 3C FF 1A1D          421          MVI   DDDF+255,X'FF'          SETUP SCAN
 0CF2 0C FE 1A1C 1A1D     422          MVC   DDDF+254(255),DDDF+255    ARGUMENT IN
 0CF8 0C 02 1920 189F     423          MVC   DDDF+2(3),PATRN+2           DDDF AREA
                          424 *
 0CFE C0 87 138A          425          B     SCANE               SCAN READ OR EQUAL
 0D02 01            0D02  426          DC    IL1'1'              RECORD 1
 0D03 00            0D03  427          DC    IL1'0'              NN = 00
                          428 *
 0D04 C1 C3 1607          429          TIO   ERR15,X'C3'         ERROR IF SCAN HIT
                          430 *
 0D08 C0 87 1398          431          B     SCANH               SCAN READ OR HIGH OR EQUAL
 0D0C 01            0D0C  432          DC    IL1'1'              RECORD 1
 0D0D 00            0D0D  433          DC    IL1'0'              NN=00
                          434 *
 0D0F C1 C3 1607          435          TIO   ERR15,X'C3'         ERROR IF SCAN HIT
                          436 *
 0D12 C0 87 13C6          437          B     SCNRE               SCAN READ OR EQUAL
 0D16 01            0D16  438          DC    IL1'1'              RECORD 1
 0D17 00            0D17  439          DC    IL1'0'              NN=00
                          440 *
 0D18 C1 C3 1607          441          TIO   ERR15,X'C3'         ERROR IF SCAN HIT
                          442 *
                          443 *
 0D1C C0 87 13D4          444          B     SCNRH               SCAN READ OR HIGH OR EQUAL
 0D20 01            0D20  445          DC    IL1'1'              RECORD 1
 0D21 00            0D21  446          DC    IL1'0'              NN = 00
                          447 *
 0D22 C1 C3 1607          448          TIO   ERR15,X'C3'         ERROR IF SCAN HIT
                          449 *
 0D26 3C 77 191F          450          MVI   DDDF+1,X'77'        CHANGE DDDF TO CAUSE SCAN HIT
                          451 *
 0D2A C0 87 1398          452          B     SCANH               SCAN READ OR HIGH OR EQUAL
 0D2E 01            0D2E  453          DC    IL1'1'              RECORD 1
 0D2F 00            0D2F  454          DC    IL1'0'              NN = 00
                          455 *
 0D30 C1 C3 0D38          456          TIO   ROAB1,X'C3'         ERROR IF
 0D34 C0 87 1600          457          B     ERR14                 NO SCAN HIT
                          458 *
 0D38 38 40 18E0          459 ROAB1    TBN   SNS,BIT1            ERROR IF NO
 0D3C C0 90 15F9          460          BF    ERR13                 SCAN EQUAL CONDITION
                          461 *
 0D40 C0 87 13D4          462          B     SCNRH               SCAN READ OR HIGH OR EQUAL
 0D44 01            0D44  463          DC    IL1'1'              RECORD 1
 0D45 00            0D45  464          DC    IL1'0'              NN=00
                          465 *
 0D46 C1 C3 0D4E          466          TIO   ROAB2,X'C3'         ERROR IF
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0D4A C0 87 1600          467          B     ERR14               NO SCAN HIT
                          468 *
 0D4E 38 40 18E0          469 ROAB2    TBN   SNS,B,T1           ERROR IF NO
 0D52 C0 90 1600          470          BF    ERR14                 SCAN EQUAL CONDITION
                          471 *
 0D56 C0 87 1013          472          B     NXDRV               REPEAT FOR EACH DRIVE BEING TESTED
                          473 *
 0D5A 0E 00 189E 189E     474 ROAC     ALC   PATRN+1(1),PATRN+1 SHIFT TEST PATTERN
 0D60 3A 01 189E          475          SBN   PATRN+1,BIT7           BYTE LEFT ONE BIT POSITION
                          476 *
 0D64 3D FF 189E          477          CLI   PATRN+1,X'FF'         LOOP UNTIL ALL
 0D68 C0 01 1058          478          BNE   LOOP                    BIT POSITIONS HAVE BEEN TESTED
                          479 *
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              481 ********************************************************************************
                              482 *                                                                              *
                              483 *              ROUTINE 0B - SCAN EQUAL TEST                                    *
                              484 *                                                                              *
                              485 ********************************************************************************
                              486 *
  0D6C 3C 0A 18B2             487 ROB      MVI   LPCNT,10             LOOP THIS TEST 10 TIMES
                              488 *
  0D70 C0 87 0F6A             489          B     BEGIN                PERFORM ROUTINE INITIALIZATION
  0D74 0D87           0D75    490          DC    AL2(ROBB)            'LOOP' SUBROUTINE RETURN ADDRESS
  0D76 0E19           0D77    491          DC    AL2(ROBC)            'NXDRV' SUBROUTINE RETURN ADDRESS
                              492 *
  0D78 C0 87 1072             493 ROBA     B     RECAL                RECALIBRATE
  0D7C C0 87 1272             494          B     RDSNS                DETERMINE DATA MODULE SIZE
                              495 *
  0D80 C0 87 1084             496          B     SEEK                 SEEK (3340 PHYSICAL ADDRESS)
  0D84 00             0D84    497          DC    IL1'0'                 HEAD 0
  0D85 015D           0D86    498          DC    IL2'349'               CE CYLINDER
                              499 *
  0D87 C0 87 110F             500 ROBB     B     RDHAE                READ HOME ADDR AND R0 COUNT EVEN
                              501 *
  0D8B 3C FF 1A1E             502          MVI   DDDF+256,X'FF'           SETUP SCAN
  0D8F 0C FF 1A1D 1A1E        503          MVC   DDDF+255(256),DDDF+256     ARGUMENT IN
  0D95 0C 03 1924 189C        504          MVC   DDDF+6(4),WCPTN              DDDF AREA
  0D9B 0C 01 1921 189C        505          MVC   DDDF+3(2),WCPTN
  0DA1 0C 01 191F 187C        506          MVC   DDDF+1(2),NULLS
                              507 *
  0DA7 38 01 18C6             508          TBN   IDDDR,BIT7           SKIP IF DDDF IS
  0DAB F2 90 06               509          JF    ROBB1                  ON EVEN ADDRESS BOUNDARY
                              510 *
  0DAE 0C 05 1925 1924        511          MVC   DDDF+7(6),DDDF+6     SHIFT SCAN ARGUMENT FOR ODD BOUNDARY
                              512 *
  0DB4 C0 87 136A             513 ROBB1    B     SCANE                SCAN READ OR EQUAL
  0DB8 01             0DB8    514          DC    IL1'1'                 RECORD 1
  0DB9 00             0DB9    515          DC    IL1'0'                 NN = 00
                              516 *
  0DBA C1 C3 0DC2             517          TIO   ROBB2,X'C3'          ERROR IF
  0DBE C0 87 1600             518          B     ERR14                  NO SCAN HIT
                              519 *
  0DC2 38 40 18E0             520 ROBB2    TBN   SNS,BIT1             ERROR IF NO
  0DC6 C0 90 15F9             521          BF    ERR13                  SCAN EQUAL CONDITION
                              522 *
  0DCA 38 01 18C6             523          TBN   IDDDR,BIT7           SKIP IF DDDF IS
  0DCE F2 10 0E               524          JT    ROBB3                  ON ODD ADDRESS BOUNDARY
                              525 *
  0DD1 0D 03 1928 1898        526          CLC   DDDF+10(4),FFPTN     ERROR IF RESIDUAL
  0DD7 C0 01 1626             527          BNE   ERR19                DDDF IS INCORRECT
                              528 *
  0DDB C0 87 0DE9             529          B     ROBB4                REPEAT TEST FOR SCAN OR EQUAL
                              530 *
  0DDF 0D 03 1929 1898        531 ROBB3    CLC   DDDF+11(4),FFPTN     ERROR IF RESIDUAL
  0DE5 C0 01 1626             532          BNE   ERR19                  DDDF IS INCORRECT
                              533 *
  0DE9 C0 87 13C6             534 ROBB4    B     SCNRE                SCAN READ OR EQUAL
  0DED 01             0DED    535          DC    IL1'1'                 RECORD 1
  0DEE 00             0DEE    536          DC    IL1'0'                 NN=00
                              537 *
  0DEF C1 C3 0DF7             538          TIO   ROBB5,X'C3'          ERROR IF
  0DF3 C0 87 1600             539          B     ERR14                  NO SCAN HIT
                              540 *
  0DF7 38 40 18E0             541 ROBB5    TBN   SNS,BIT1             ERROR IF NO
  0DFB C0 90 15F9             542          BF    ERR13                  SCAN EQUAL CONDITION
                              543 *
  0DFF 0D 03 1928 189C        544          CLC   DDDF+10(4),WCPTN     ERROR IF RESIDUAL
  0E05 C0 01 1626             545          BNE   ERR19                   DDDF IS INCORRECT
                              546 *
  0E09 38 01 18C6             547          TBN   IDDDR,BIT7           REPEAT
  0E0D 3A 01 18C6             548          SBN   IDDDR,BIT7             TEST USING ODD
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  0E11 C0 90 0D87             549          BF    ROBB                 MAIN STORAGE BOUNDARY
                              550 *
  0E15 C0 87 1013             551          B     NXDRV                REPEAT FOR EACH DRIVE BEING TESTED
                              552 *
  0E19 0F 00 18B2 187E        553 ROBC     SLC   LPCNT(1),P1           LOOP THIS
  0E1F C0 01 1058             554          BNZ   LOOP                   TEST 10 TIMES
                              555 *
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           557 ************************************************************************
                           558 *                                                                      *
                           559 *                ROUTINE 0C - SCAN HIGH OR EQUAL TEST                  *
                           560 *                                                                      *
                           561 ************************************************************************
                           562 *
0E23 0C 03 18A0 189C       563 ROC      MVC   PATRN+3(4),WCPTN     INITIALIZE
0E29 3C FE 189F            564          MVI   PATRN+2,X'FE'          TEST PATTERN
                           565 *
0E2D C0 87 0F6A            566          B     BEGIN                PERFORM ROUTINE INITIALIZATION
0E31 0E44          0E32    567          DC    AL2(ROCB)            'LOOP' SUBROUTINE RETURN ADDRESS
0E33 0EA0          0E34    568          DC    AL2(ROCC)            'NXDRV' SUBROUTINE RETURN ADDRESS
                           569 *
0E35 C0 87 1072            570 ROCA     B     RECAL                RECALIBRATE
0E39 C0 87 1272            571          B     RDSNS                DETERMINE DATA MODULE SIZE
                           572 *
0E3D C0 87 1084            573          B     SEEK                 SEEK (3340 PHYSICAL ADDRESS)
0E41 00            0E41    574          DC    IL1'0'                 HEAD 0
0E42 015D          0E43    575          DC    IL2'349'               CE CYLINDER
                           576 *
0E44 C0 87 110F            577 ROCB     B     RDHAE                READ HOME ADDR AND R0 COUNT EVEN
                           578 *
0E48 3C FF 1A1D            579          MVI   DDDF+255,X'FF'         SETUP SCAN
0E4C 0C FE 1A1C 1A1D       580          MVC   DDDF+254(255),DDDF+255   ARGUMENT IN
0E52 0C 03 1921 18A0       581          MVC   DDDF+3(4),PATRN+3          DDDF AREA
0E58 3C FF 1922            582          MVI   DDDF+4,X'FF'
                           583 *
0E5C C0 87 1398            584          B     SCANH                SCAN READ OR HIGH OR EQUAL
0E60 01            0E60    585          DC    IL1'1'                 RECORD 1
0E61 00            0E61    586          DC    IL1'0'                 NN = 00
                           587 *
0E62 C1 C3 0E6A            588          TIO   ROCB1,X'C3'          ERROR IF
0E66 C0 87 1600            589          B     ERR14                  NO SCAN HIT
                           590 *
0E6A 38 40 18E0            591 ROCB1    TBN   SNS,BIT1             ERROR IF
0E6E C0 10 162E            592          BT    ERR1A                  SCAN EQUAL CONDITION
                           593 *
0E72 0D 03 1927 1898       594          CLC   DDDF+9(4),FFPTN      ERROR IF RESIDUAL
0E78 C0 01 1626            595          BNE   ERR19                  DDDF IS INCORRECT
                           596 *
0E7C C0 87 13D4            597          B     SCNRH                SCAN READ OR HIGH OR EQUAL
0E80 01            0E80    598          DC    IL1'1'                 RECORD 1
0E81 00            0E81    599          DC    IL1'0'                 NN=00
                           600 *
0E82 C1 C3 0E8A            601          TIO   ROCB2,X'C3'          ERROR IF
0E86 C0 87 1600            602          B     ERR14                  NO SCAN HIT
                           603 *
0E8A 38 40 18E0            604 ROCB2    TBN   SNS,BIT1             ERROR IF
0E8E C0 10 162E            605          BT    ERR1A                  NO SCAN HIT
                           606 *
0E92 0D 03 1927 189C       607          CLC   DDDF+9(4),WCPTN      ERROR IF RESIDUAL
0E98 C0 01 1626            608          BNE   ERR19                  DDDF IS INCORRECT
                           609 *
0E9C C0 87 1013            610          B     NXDRV                REPEAT FOR EACH DRIVE BEING TESTED
                           611 *
0EA0 0E 00 189F 189F       612 ROCC     ALC   PATRN+2(1),PATRN+2    SHIFT TEST PATTERN
0EA6 3A 01 189F            613          SBN   PATRN+2,BIT7            BYTE LEFT ONE BIT POSITION
                           614 *
0EAA 3D FF 189F            615          CLI   PATRN+2,X'FF'        LOOP UNTIL ALL
0EAE C0 01 1058            616          BNE   LOOP                   BIT POSITIONS HAVE BEEN TESTED
                           617 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           619 ************************************************************************
                           620 *                                                                      *
                           621 *                ROUTINE 0D - WRITE REPEAT / READ VERIFY TEST          *
                           622 *                                                                      *
                           623 ************************************************************************
                           624 *
0EB2 C0 87 0F6A            625 ROD      B     BEGIN                PERFORM ROUTINE INITIALIZATION
0EB6 0EC9          0EB7    626          DC    AL2(RODB)            'LOOP' SUBROUTINE RETURN ADDRESS
0EB8 0EF3          0EB9    627          DC    AL2(ROE)             'NXDRV' SUBROUTINE RETURN ADDRESS
                           628 *
0EBA C0 87 1072            629 RODA     B     RECAL                RECALIBRATE
0EBE C0 87 1272            630          B     RDSNS                DETERMINE DATA MODULE SIZE
                           631 *
0EC2 C0 87 1084            632          B     SEEK                 SEEK (3340 PHYSICAL ADDRESS)
0EC6 00            0EC6    633          DC    IL1'0'                 HEAD 0
0EC7 015D          0EC8    634          DC    IL2'349'               CYLINDER 349
                           635 *
0EC9 B8 08 00              636 RODB     TBN   DIND(,XR2),NOWR       BYBASS DRIVE IF                  02
0ECC C0 10 1013            637          BT    NXDRV                  WRITE INHIBITED                  02
                           638 *                                                                       02
0ED0 C0 87 110F            639          B     RDHAE                READ HOME ADDR AND R0 COUNT EVEN   02
                           640 *
0ED4 C0 87 12D4            641          B     WRR00                WRITE RECORD ZERO CNT-KEY-DATA ODD
                           642 *
0ED8 C0 87 1191            643          B     RDCKD                READ COUNT-KEY-DATA
0EDC 01            0EDC    644          DC    IL1'1'                 RECORD 1
                           645 *
0EDD C0 87 12F9            646          B     WRCKD                WRITE COUNT-KEY-DATA
0EE1 02            0EE1    647          DC    IL1'2'                 RECORD 2
0EE2 13            0EE2    648          DC    IL1'19'                NN = 19
                           649 *
0EE3 C0 87 133B            650          B     WRREP                WRITE REPEAT KEY-DATA
0EE7 02            0EE7    651          DC    IL1'2'                 RECORD 2
0EE8 13            0EE8    652          DC    IL1'19'                NN = 19
                           653 *
0EE9 C0 87 1218            654          B     RDVKD                READ VERIFY KEY-DATA
0EED 02            0EED    655          DC    IL1'2'                 RECORD 2
0EEE 13            0EEE    656          DC    IL1'19'                NN = 19
                           657 *
0EEF C0 87 1013            658          B     NXDRV                REPEAT FOR EACH DRIVE BEING TESTED
                           659 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              661 ********************************************************************************
                              662 *                                                                              *
                              663 *                ROUTINE 0E - CYLINDER SEEK TEST                               *
                              664 *                                                                              *
                              665 ********************************************************************************
                              666 *
  0EF3 0C 01 0F17 187C        667 ROE       MVC   ROEA1(2),NULLS      CYL ADDR = 000 FOR FIRST SEEK
                              668 *
  0EF9 C2 01 0A01             669           LA    PID,XR1             INITIALIZE PSUEDO
  0EFD 34 01 18B2             670           ST    LPCNT,XR1             RANDOM NUMBER GENERATOR
                              671 *
  0F01 C0 87 0F6A             672           B     BEGIN               PERFORM ROUTINE INITIALIZATION
  0F05 0F1C             0F06  673           DC    AL2(ROEB)           'LOOP' SUBROUTINE RETURN ADDRESS
  0F07 0F48             0F08  674           DC    AL2(ROEC)           'NXDRV' SUBROUTINE RETURN ADDRESS
                              675 *
  0F09 C0 87 1072             676 ROEA      B     RECAL               RECALIBRATE
  0F0D C0 87 1272             677           B     RDSNS               DETERMINE DATA MODULE SIZE
                              678 *
  0F11 C0 87 1084             679           B     SEEK                SEEK (3340 PHYSICAL ADDRESS)
  0F15 00               0F15  680           DC    IL1'0'                HEAD 0
  0F16                  0F17  681 ROEA1     DS    IL2                   CYLINDER 0 - 349
                              682 *
  0F18 C0 87 110F             683           B     RDHAE               READ HOME ADDR AND RO COUNT EVEN
                              684 *
  0F1C 35 01 18B2             685 ROEB      L     LPCNT,XR1           GENERATE
  0F20 0C 01 0F3F 0F17        686           MVC   ROEB2(2),ROEA1        SIMULATED
  0F26 1E 01 0F3F 00          687 ROEB1     ALC   ROEB2(2),0(,XR1)      RANDOM
  0F2B 3B FE 0F3E             688           SBF   ROEB2-1,X'FE'           CYLINDER
  0F2F 0D 01 0F3F 1892        689           CLC   ROEB2(2),P349             ADDRESS
  0F35 C0 84 0F26             690           BH    ROEB1
                              691 *
  0F39 C0 87 1084             692           B     SEEK                SEEK (3340 PHYSICAL ADDRESS)
  0F3D 00               0F3D  693           DC    IL1'0'                HEAD 0
  0F3E                  0F3F  694 ROEB2     DS    IL2                   CYLINDER 0 - 349
                              695 *
  0F40 C0 87 110F             696           B     RDHAE               READ HOME ADDR AND RO COUNT EVEN
                              697 *
  0F44 C0 87 1013             698           B     NXDRV               REPEAT FOR EACH DRIVE BEING TESTED
                              699 *
  0F48 0C 01 0F17 0F3F        700 ROEC      MVC   ROEA1(2),ROEB2      SAVE CYLINDER ADDR FOR ERR RECOVERY
                              701 *
  0F4E C2 01 0B01             702           LA    PID+256,XR1
  0F52 34 01 18E4             703           ST    WORKN,XR1
  0F56 0E 01 18B2 187E        704           ALC   LPCNT(2),P1         LOOP UNTIL
  0F5C 0D 01 18B2 18E4        705           CLC   LPCNT(2),WORKN        256 CYLINDER
  0F62 C0 01 1058             706           BNE   LOOP                    SEEKS HAVE BEEN PERFORMED
                              707 *
  0F66 C0 87 0A15             708           B     R01                 OTHERWISE LOOP INDEFINITELY
                              709 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              711 ********************************************************************************
                              712 *                                                                              *
                              713 *          INITIALIZATION AND LOOP CONTROL SUBROUTINES                         *
                              714 *                                                                              *
                              715 ********************************************************************************
                              716 *
                              717 *          ROUTINE INITIALIZATION
                              718 *
  0F6A 34 08 18E4             719 BEGIN     ST    WORKN,ARR           POINT TO SUBROUTINE
  0F6E 35 01 18E4             720           L     WORKN,XR1             CALL PARAMETERS
                              721 *
  0F72 1C 01 1071 01          722           MVC   LOOPX+3(2),1(,XR1)  SETUP 'LOOP' SUBROUTINE RETURN
  0F77 1C 01 1057 03          723           MVC   NXDRVX+3(2),3(,XR1) SETUP 'NXDRV' SUBROUTINE RETURN
                              724 *
  0F7C D2 01 04               725           LA    4(,XR1),XR1         SETUP 'BEGIN'
  0F7F 34 01 1012             726           ST    BGNX+3,XR1            SUBROUTINE RETURN
                              727 *
  0F83 F3 C4 7E               728 BGN01     SIO   X'7E',X'C4'         RESET AND DISABLE 3340 INTRPS
                              729 *
  0F86 31 C5 18A8             730           LIO   SYSRST,X'C5'        FORCE ATTACHMENT
  0F8A 31 C5 18AA             731           LIO   SVPREQ,X'C5'          SYSTEM RESET
                              732 *
  0F8E C2 01 FD65             733           LA    X'FD65',XR1         DELAY
  0F92 36 01 187E             734           A     P1,XR1                10 MSEC
  0F96 C0 01 0F92             735           BNZ   *-4
                              736 *
  0F9A 31 C5 18AC             737           LIO   CEMODE,X'C5'        SET CE MODE
  0F9E 31 C5 18AA             738           LIO   SVPREQ,X'C5'          INDICATORS
                              739 *
  0FA2 0D 01 0A01 0A01        740           CLC   PID(2),IDADR        GO TO SUPERVISOR
  0FA8 C0 01 0A0A             741           BNE   ENTRY                 IF RUNNING SYSTEM TEST
                              742 *
  0FAC 0C 01 18C4 18A4        743           MVC   IDDCR(2),DDCR       INITIALIZE DDCR
  0FB2 0C 01 18C6 18A6        744           MVC   IDDDR(2),DDDR         AND DDDR VALUES
                              745 *
  0FB8 38 80 18AF             746           TBN   IND,BGNSW           BRANCH IF NOT
  0FBC C0 10 0FDC             747           BT    BGN02                 PROGRAM RESTART
                              748 *
  0FC0 0C 09 17FF 1854        749           MVC   MSG(10),NOERRS      INITIALIZE
  0FC6 0C 09 182F 1854        750           MVC   MSG2(10),NOERRS       LOG MESSAGE AREAS
                              751 *
  0FCC 3C 00 1819             752           MVI   DGSNS,0             INITIALIZE
  0FD0 0C 16 1818 1819        753           MVC   DGSNS-1(23),DGSNS     SENSE DATA
  0FD6 0C 17 1549 1819        754           MVC   DGSNS2(24),DGSNS
                              755 *
  0FDC 3C 80 18AF             756 BGN02     MVI   IND,BGNSW           RESET PROGRAM INDICATORS
                              757 *
  0FE0 C2 01 18BA             758           LA    ADRTBL,XR1          POINT TO DRV WORK AREA ADDR TBL
                              759 *
  0FE4 C2 02 18E5             760           LA    DRVWK1,XR2          STORE DRIVE 1
  0FE8 74 02 01               761           ST    1(,XR1),XR2           WORK AREA ADDRESS IN TABLE
  0FEB D2 01 02               762           LA    2(,XR1),XR1             AND ADVANCE TABLE POINTER
                              763 *
  0FEE BC 00 00               764           MVI   DIND(,XR2),0        RESET DRIVE DEPENDENT IND
                              765 *
  0FF1 C2 02 18FC             766           LA    DRVWK2,XR2          STORE DRIVE 2
  0FF5 74 02 01               767           ST    1(,XR1),XR2           WORK AREA ADDRESS IN TABLE
  0FF8 D2 01 02               768           LA    2(,XR1),XR1             AND ADVANCE TABLE POINTER
                              769 *
  0FFB BC 00 00               770           MVI   DIND(,XR2),0        RESET DRIVE DEPENDENT IND
                              771 *
  0FFE 7C FF 00               772 BGN06     MVI   0(,XR1),X'FF'       MOVE TERMINATOR TO ADDR TABLE
                              773 *
  1001 C2 01 18BA             774           LA    ADRTBL,XR1          POINT TO START OF ADDRESS TABLE
  1005 34 01 18B9             775           ST    ADRPTR,XR1          INITIALIZE ADDRESS TABLE PTR
  1009 75 02 01               776           L     1(,XR1),XR2         FIRST DRIVE WK AREA ADDR TO XR2
                              777 *
  100C BA 40 00               778           SBN   DIND(,XR2),LPSW     SET DRIVE LOOP INDICATOR
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          779 *
 100F C0 87 0000          780 BGNX     B     *-*                    RETURN TO CALLING ROUTINE
                          781 *
                          782 *-------------------------------------------------------------------
                          783 *              REPEAT TEST ON NEXT DRIVE
                          784 *
 1013 F3 C4 7E            785 NXDRV    SIO   X'7E',X'C4'            RESET AND DISABLE 3340 INTRPS
                          786 *
 1016 0D 01 0A01 0A01     787          CLC   PID(2),IDADR           GO TO SUPERVISOR
 101C C0 01 0A0A          788          BNE   ENTRY                    IF RUNNING SYSTEM TEST
                          789 *
 1020 35 01 18B9          790 NXD01    L     ADRPTR,XR1             GET ADDRESS TABLE POINTER
                          791 *
 1024 7D FF 02            792          CLI   2(,XR1),X'FF'          BRANCH IF ALL DRIVES
 1027 F2 81 0E            793          JE    NXD02                    HAVE BEEN TESTED
                          794 *
 102A 75 02 03            795          L     3(,XR1),XR2            POINT TO NEXT DRV WORK AREA
                          796 *
 102D D2 01 02            797          LA    2(,XR1),XR1            ADVANCE ADDRESS
 1030 34 01 18B9          798          ST    ADRPTR,XR1               TABLE POINTER
                          799 *
 1034 C0 87 1058          800          B     LOOP                   GO TO TEST NEXT DRIVE
                          801 *
 1038 C2 01 18BA          802 NXD02    LA    ADRTBL,XR1             RE-INITIALIZE
 103C 34 01 18B9          803          ST    ADRPTR,XR1               ADDRESS TABLE POINTER AND
 1040 75 02 01            804          L     1(,XR1),XR2                POINT TO FIRST DRIVE AREA
                          805 *
 1043 38 40 18AF          806          TBN   IND,HLTSW              CONTINUE TESTING IF
 1047 F2 90 0A            807          JF    NXDRVX                   NO ERRORS OCCURRED
                          808 *
 104A 38 40 18AF          809          SBF   IND,HLTSW              RESET ERROR HALT INDICATOR
                          810 *
 104E C0 87 0222          811          B     HALT                   ERROR HALT
 1052 C100          1053  812 ERRHLT   DC    AL2(HLTXX)
                          813 *
 1054 C0 87 0000          814 NXDRVX   B     *-*                    RETURN TO CALLING ROUTINE
                          815 *
                          816 *-------------------------------------------------------------------
                          817 *              SETUP TEST LOOP ADDRESS
                          818 *
 1058 0C 01 18C4 18A4     819 LOOP     MVC   IDDCR(2),DDCR          RE-INITIALIZE
 105E 0C 01 18C6 18A6     820          MVC   IDDDR(2),DDDR            DDCR AND DDDR VALUES
                          821 *
 1064 B8 40 00            822          TBN   DIND(,XR2),LPSW        TEST DRIVE LOOP INDICATOR
 1067 BA 40 00            823          SBN   DIND(,XR2),LPSW        RESET INDICATOR
 106A C0 90 100F          824          BF    BGNX                   BRANCH IF IND WAS OFF
                          825 *
 106E C0 87 0000          826 LOOPX    B     *-*                    RETURN TO CALLING ROUTINE
                          827 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          829 ***************************************************************************
                          830 *                                                                         *
                          831 *              3340 COMMAND EXECUTION SUBROUTINES                         *
                          832 *                                                                         *
                          833 ***************************************************************************
                          834 *
                          835 *              RECALIBRATE COMMAND
                          836 *
 1072 34 08 110E          837 RECAL    ST    SEEKX+3,ARR            SAVE RETURN ADDRESS
                          838 *
 1076 BC 00 05            839          MVI   Q(,XR2),X'00'          SETUP Q AND R
 1079 BC 01 06            840          MVI   R(,XR2),X'01'            BYTES FOR SIO COMMAND
                          841 *
 107C 8C 09 14 187C       842          MVC   NN(10,XR2),NULLS       CLEAR DDCF AREA
                          843 *
 1081 F2 87 6B            844          J     SEEKA                  GO TO EXECUTE COMMAND
                          845 *
                          846 *-------------------------------------------------------------------
                          847 *              SEEK COMMAND
                          848 *
 1084 34 08 18E4          849 SEEK     ST    WORKN,ARR              SETUP POINTER TO
 1088 35 01 18E4          850          L     WORKN,XR1                SUBRTN CALL PARAMETERS
                          851 *
 108C 1C 02 18E4 02       852          MVC   WORK+3,2(3,XR1)        MOVE PARAMETERS TO WORK AREA
                          853 *
 1091 3C 08 18E1          854          MVI   WORK,11                SETUP MULTIPLIER FOR 12 HEADS
                          855 *
 1095 B8 80 00            856          TBN   DIND(,XR2),CEDM        BRANCH IF NOT
 1098 F2 90 08            857          JF    SK01                     CE DATA MODULE
                          858 *
 109B 3C 01 18E1          859          MVI   WORK,1                 SETUP MULTIPLIER FOR 2 HEADS
                          860 *
 109F 7D 01 00            861          CLI   0(,XR1),1              BYPASS TEST IF HEAD
 10A2 C0 84 1013          862          BH    NXDRV                    ADDRESS IS GREATER THAN 1
                          863 *
 10A6 BC 00 05            864 SK01     MVI   Q(,XR2),X'00'          SETUP Q AND R
 10A9 BC 00 06            865          MVI   R(,XR2),X'00'            BYTES FOR SIO COMMAND
                          866 *
 10AC 8C 09 14 187C       867          MVC   NN(10,XR2),NULLS       CLEAR DDCF AREA
                          868 *
 10B1 1E 01 18E4 02       869 SK02     ALC   WORK+3,2(2,XR1)        MULTIPLY PHYSICAL
 10B6 0F 00 18E1 187E     870          SLC   WORK(1),P1                CYLINDER ADDRESS
 10BC C0 01 10B1          871          BNZ   SK02                       BY NUMBER OF HEADS
                          872 *
 10C0 0E 01 18E4 18E2     873          ALC   WORK+3(2),WORK+1        ADD HEAD ADDRESS
                          874 *
 10C6 D2 01 03            875          LA    3(,XR1),XR1            SETUP
 10C9 34 01 110E          876          ST    SEEKX+3,XR1              RETURN ADDRESS
                          877 *
 10CD C2 01 0000          878          LA    0,XR1                  DIVIDE BY 20
 10D1 0D 01 18E4 188C     879 SK03     CLC   WORK+3(2),P20            TO GET CYLINDER
 10D7 F2 82 0D            880          JL    SK04                       SEEK ARGUMENT IN
 10DA D2 01 01            881          LA    1(,XR1),XR1                  INDEX REGISTER 1 AND
 10DD 0F 01 18E4 188C     882          SLC   WORK+3(2),P20                HEAD SEEK ARGUMENT
 10E3 C0 87 10D1          883          B     SK03                           IN WORK AREA
                          884 *
 10E7 B4 01 0D            885 SK04     ST    CC(,XR2),XR1           STORE SEEK
 10EA 8C 01 0F 18E4       886          MVC   HH(,XR2),WORK+3(2)       ARGUMENT IN DDCF
                          887 *
 10EF C0 87 13E2          888 SEEKA    B     XEQ                    GO TO EXECUTE COMMAND
                          889 *
 10F3 0D 01 18C6 18CA     890          CLC   IDDDR(2),RDDDR         GO TO ERROR END IF
 10F9 C0 01 160E          891          BNE   ERR16                    RESIDUAL DDDR IS INCORRECT
                          892 *
 10FD 0D 09 18D4 18DE     893          CLC   IDDCFN(10),RDDCFN      GO TO ERROR END IF
 1103 C0 01 161E          894          BNE   ERR18                    RESIDUAL DDCF IS INCORRECT
                          895
 1107 AC 03 0A 0F         896          MVC   PA(4,XR2),HH(,XR2)     SAVE CURRENT PHYSICAL ADDRESS
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          897 *
 110B C0 87 0000          898 SEEKX    B      *-*                    RETURN TO CALLING ROUTINE
                          899 *
                          900 *-------------------------------------------------------------------
                          901 *               READ HOME ADDRESS AND RECORD ZERO COUNT EVEN
                          902 *
 110F 34 08 1154          903 RDHAE    ST     RDHAOX+3,ARR           SAVE RETURN ADDRESS
                          904 *
 1113 BC 01 05            905          MVI    Q(,XR2),X'01'          SETUP Q AND R
 1116 BC 01 06            906          MVI    R(,XR2),X'01'            BYTES FOR SIO COMMAND
                          907 *
 1119 F2 87 0A            908          J      RDHAOA                 GO TO EXECUTE COMMAND
                          909 *
                          910 *-------------------------------------------------------------------
                          911 *               READ HOME ADDRESS AND RECORD ZERO COUNT ODD
                          912 *
 111C 34 08 1154          913 RDHAO    ST     RDHAOX+3,ARR           SAVE RETURN ADDRESS
                          914 *
 1120 BC 01 05            915          MVI    Q(,XR2),X'01'          SETUP Q AND R
 1123 BC 09 06            916          MVI    R(,XR2),X'09'            BYTES FOR SIO COMMAND
                          917 *
 1126 8C 09 14 187C       918 RDHAOA   MVC    NN(10,XR2),NULLS       CLEAR DDCF AREA
                          919 *
 112B C0 87 13E2          920          B      XEQ                    GO TO EXECUTE COMMAND
                          921 *
 112F 2D 03 18D9 0A       922          CLC    RDDCF+4(4),PA(,XR2)    GO TO ERROR EXIT IF
 1134 C0 01 161E          923          BNE    ERR18                    HA READ IS INCORRECT
                          924 *
 1138 35 01 18C6          925          L      IDDDR,XR1              SAVE RESIDUAL DDDF
 113C 9C 08 13 08         926          MVC    DL(9,XR2),8(,XR1)        FOR USE IN NEXT DDCF
                          927 *
 1140 D2 01 09            928          LA     9(,XR1 ,XR1            CALCULATE EXPECTED
 1143 34 01 18E4          929          ST     WORKN,XR1                RESIDUAL DDDR
                          930 *
 1147 0D 01 18E4 18CA     931          CLC    WORKN(2),RDDDR         GO TO ERROR END IF
 114D C0 01 160E          932          BNE    ERR16                    RESIDUAL DDDR IS INCORRECT
                          933 *
 1151 C0 87 0000          934 RDHAOX   B      *-*                    RETURN TO CALLING ROUTINE
                          935 *
                          936 *-------------------------------------------------------------------
                          937 *               READ RECORD ZERO KEY-DATA ODD
                          938 *
 1155 34 08 1190          939 RDR00    ST     RDR00X+3,ARR           SAVE RETURN ADDRESS
                          940 *
 1159 BC 01 05            941          MVI    Q(,XR2),X'01'          SETUP Q AND R
 115C BC 08 06            942          MVI    R(,XR2),X'08'            BYTES FOR SIO COMMAND
                          943 *
 115F BC 00 10            944          MVI    RR(,XR2),0             CLEAR DDCF RR FIELD
 1162 BC 00 14            945          MVI    NN(,XR2),0             CLEAR DDCF NN FIELD
                          946 *
 1165 C0 87 13E2          947          B      XEQ                    GO TO EXECUTE COMMAND
                          948 *
 1169 8D 08 13 18DD       949 RDR00A   CLC    DL(9,XR2),RDDCF+8      GO TO ERROR END IF
 116E C0 01 161E          950          BNE    ERR18                    RESIDUAL DDCF IS INCORRECT
                          951 *
 1172 BC 00 10            952          MVI    RR(,XR2),0             CLEAR RR FIELD
                          953 *
 1175 35 01 18C6          954          L      IDDDR,XR1              CALCULATE
 1179 B6 01 11            955          A      KL(,XR2),XR1             EXPECTED
 117C B6 01 13            956          A      DL(,XR2),XR1               RESIDUAL DDDR
 117F 34 01 18E4          957          ST     WORKN,XR1
                          958 *
 1183 0D 01 18E4 18CA     959          CLC    WORKN(2),RDDDR         GO TO ERROR END IF
 1189 C0 01 160E          960          BNE    ERR16                    RESIDUAL DDDR IS INCORRECT
                          961 *
 118D C0 87 0000          962 RDR00X   B      *-*                    RETURN TO CALLING ROUTINE
                          963 *
                          964 *-------------------------------------------------------------------
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          965 *               READ COUNT-KEY-DATA
                          966 *
 1191 34 08 1190          967 RDCKD    ST     RDR00X+3,ARR           SAVE RETURN ADDRESS
                          968 *
 1195 BC 01 05            969          MVI    Q(,XR2),X'01'          SETUP Q AND R
 1198 BC 02 06            970          MVI    R(,XR2),X'02'            BYTES FOR SIO COMMAND
                          971 *
 119B 8C 03 14 187C       972          MVC    NN(4,XR2),NULLS        CLEAR KL, DL, AND NN FIELDS  03
                          973 *
 11A0 35 01 1190          974          L      RDR00X+3,XR1           MOVE RECORD
 11A4 9C 00 10 00         975          MVC    RR(1,XR2),0(,XR1)        NUMBER TO DDCF
                          976 *
 11A8 C0 87 13E2          977          B      XEQ                    GO TO EXECUT. COMMAND
                          978 *
 11AC 8C 02 13 18DD       979          MVC    DL(3,XR2),RDDCF+8      SAVE KEY AND DATA LENGTHS READ
                          980 *
 11B1 0E 01 1190 187E     981          ALC    RDR00X+3(2),P1         SETUP RETURN ADDRESS
                          982 *
 11B7 C0 87 1169          983          B      RDR00A                 GO TO CHECK RESIDUAL VALUES
                          984 *
                          985 *-------------------------------------------------------------------
                          986 *               READ KEY-DATA
                          987 *
 11BB 34 08 1217          988 RDKD     ST     RDKDX+3,ARR            SAVE RETURN ADDRESS
                          989 *
 11BF BC 01 05            990          MVI    Q(,XR2),X'01'          SETUP Q AND R
 11C2 BC 00 06            991          MVI    R(,XR2),X'00'            BYTES FOR SIO COMMAND
                          992 *
 11C5 35 01 1217          993 RDKDA    L      RDKDX+3,XR1            MOVE RECORD
 11C9 9C 00 10 00         994          MVC    RR(1,XR2),0(,XR1)        NUMBER AND NN
 11CD 9C 00 14 01         995          MVC    NN(1,XR2),1(,XR1)          VALUE TO DDCF
                          996 *
 11D1 C0 87 13E2          997          B      XEQ                    GO TO EXECUTE COMMAND
                          998 *
 11D5 AE 00 10 14         999          ALC    RR(1,XR2),NN(,XR2)     CALCULATE EXPECTED RESIDUAL RR
                         1000 *
 11D9 3D FF 18DE         1001          CLI    RDDCF+9,X'FF'          GO TO
 11DD C0 01 161E         1002          BNE    ERR18                    ERROR END
 11E1 8D 08 13 18DD      1003          CLC    DL(9,XR2),RDDCF+8          IF RESIDUAL
 11E6 C0 01 161E         1004          BNE    ERR18                        DDCF IS INCORRECT
                         1005 *
 11EA BC 00 10           1006          MVI    RR(,XR2),0             CLEAR RR FIELD
                         1007 *
 11ED 35 01 18C6         1008          L      IDDDR,XR1              CALCULATE
 11F1 B6 01 11           1009 RDKDB    A      KL(,XR2),XR1             EXPECTED
 11F4 B6 01 13           1010          A      DL(,XR2),XR1               RESIDUAL
 11F7 8E 00 14 1894      1011          ALC    NN(1,XR2),N1                 DDDR VALUE
 11FC C0 02 11F1         1012          BNM    RDKDB
                         1013 *
 1200 34 01 18E4         1014          ST     WORKN,XR1              GO TO ERROR
 1204 0D 01 18E4 18CA    1015          CLC    WORKN(2),RDDDR           END IF RESIDUAL
 120A C0 01 160E         1016          BNE    ERR16                      DDDR IS INCORRECT
                         1017 *
 120E 0E 01 1217 1880    1018          ALC    RDKDX+3(2),P2          SETUP RETURN ADDRESS
                         1019 *
 1214 C0 87 0000         1020 RDKDX    B      *-*                    RETURN TO CALLING ROUTINE
                         1021 *
                         1022 *-------------------------------------------------------------------
                         1023 *               READ VERIFY KEY-DATA
                         1024 *
 1218 34 08 125F         1025 RDVKD    ST     RDVKDX+3,ARR           SAVE RETURN ADDRESS
                         1026 *
 121C BC 01 05           1027          MVI    Q(,XR2),X'01'          SETUP Q AND R
 121F BC 03 06           1028          MVI    R(,XR2),X'03'            BYTES FOR SIO COMMAND
                         1029 *
 1222 8C 02 13 187C      1030          MVC    DL(3,XR2),NULLS        CLEAR KL AND DL FIELDS
                         1031 *
 1227 35 01 125F         1032          L      RDVKDX+3,XR1           MOVE RECORD
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   122B 9C 00 10 00      1033          MVC   RR(1,XR2),0(,XR1)       NUMBER AND NN
   122F 9C 00 14 01      1034          MVC   NN(1,XR2),1(,XR1)         VALUE TO DDCF
                         1035 *
   1233 C0 87 13E2       1036          B     XEQ                     GO TO EXECUTE COMMAND
                         1037 *
   1237 AE 00 10 14      1038          ALC   RR(1,XR2),NN(,XR2)      CALCULATE EXPECTED RESIDUAL RR
                         1039 *
   123B 3D FF 18DE       1040          CLI   RDDCF+9,X'FF'           GO TO
   123F C0 01 161E       1041          BNE   ERR18                     ERROR END
   1243 8D 05 10 18DA    1042          CLC   RR(6,XR2),RDDCF+5           IF RESIDUAL
   1248 C0 01 161E       1043          BNE   ERR18                         DDCF IS INCORRECT
                         1044 *
   124C 0D 01 18C6 18CA  1045          CLC   IDDDR(2),RDDDR          GO TO ERROR END IF
   1252 C0 01 160E       1046          BNE   ERR16                     RESIDUAL DDDR IS INCORRECT
                         1047 *
   1256 0E 01 125F 1880  1048          ALC   RDVKDX+3(2),P2          SETUP RETURN ADDRESS
                         1049 *
   125C C0 87 0000       1050 RDVKDX   B     *-*                     RETURN TO CALLING ROUTINE
                         1051 *
                         1052 *-------------------------------------------------------------
                         1053 *                READ AND RESET BUFFERED LOG
                         1054 *
   1260 34 08 12B8       1055 RDLOG    ST    RDSNSX+3,ARR            SAVE RETURN ADDRESS
                         1056 *
   1264 BC 01 05         1057          MVI   Q(,XR2),X'01'           SETUP Q AND R
   1267 BC 05 06         1058          MVI   R(,XR2),X'05'             BYTES FOR SIO COMMAND
                         1059 *
   126A C0 87 13E2       1060          B     XEQ                     GO TO EXECUTE COMMAND
                         1061 *
   126E C0 87 1296       1062          B     RDSNSA                  GO TO CHECK RESIDUAL VALUES
                         1063 *
                         1064 *-------------------------------------------------------------
                         1065 *                READ DIAGNOSTIC SENSE DATA
                         1066 *
   1272 34 08 12B8       1067 RDSNS    ST    RDSNSX+3,ARR            SAVE RETURN ADDRESS
                         1068 *
   1276 BC 01 05         1069          MVI   Q(,XR2),X'01'           SETUP Q AND R
   1279 BC 07 06         1070          MVI   R(,XR2),X'07'             BYTES FOR SIO COMMAND
                         1071 *
   127C C0 87 13E2       1072          B     XEQ                     GO TO EXECUTE COMMAND
                         1073 *
   1280 35 01 18C6       1074          L     IDDDR,XR1               SET INDICATOR
   1284 79 02 02         1075          TBF   2(,XR1),BIT6              IF SENSE DATA
   1287 F2 90 03         1076          JF    RDSNSB                      INDICATES THAT A CE       02
   128A BA 80 00         1077          SBN   DIND(,XR2),CEDM                DATA MODULE IS MOUNTED
                         1078 *
   128D 78 02 01         1079 RDSNSB   TBN   1(,XR1),BIT6             SET INDICATOR IF SENSE       02
   1290 F2 90 03         1080          JF    RDSNSA                    DATA INDICATES THAT THE    02
   1293 BA 08 00         1081          SBN   DIND(,XR2),NOWR             'READ ONLY' SW IS ON     02
                         1082 *                                                                   02
   1296 35 01 18C6       1083 RDSNSA   L     IDDDR,XR1               CALCULATE
   129A D2 01 18         1084          LA    24(,XR1),XR1              EXPECTED
   129D 34 01 18E4       1085          ST    WORKN,XR1                   RESIDUAL DDDR
                         1086 *
   12A1 0D 01 18E4 18CA  1087          CLC   WORKN(2),RDDDR          GO TO ERROR END IF
   12A7 C0 01 160E       1088          BNE   ERR16                     RESIDUAL DDDR IS INCORRECT
                         1089 *
   12AB 0D 09 18D4 18DE  1090          CLC   IDDCFN(10),RDDCFN       GO TO ERROR END IF
   12B1 C0 01 161E       1091          BNE   ERR18                     RESIDUAL DDCF IS INCORRECT
                         1092 *
   12B5 C0 87 0000       1093 RDSNSX   B     *-*                     RETURN TO CALLING ROUTINE
                         1094 *
                         1095 *-------------------------------------------------------------
                         1096 *                WRITE HOME ADDRESS AND RECORD ZERO COUNT ODD
                         1097 *
   1289 34 08 12F8       1098 WRHAO    ST    WRR00X+3,ARR            SAVE RETURN ADDRESS
                         1099 *
   128D 8C 02 05         1100          MVI   Q(,XR2),X'02'           SETUP Q AND R
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   12C0 8C 06 06         1101          MVI   R(,XR2),X'06'           BYTES FOR SIO COMMAND
                         1102 *
   12C3 8C 08 14 187C    1103 WRHAOA   MVC   NN(9,XR2),NULLS          CLEAR DDCF AREA
   12C8 AC 03 0F 0A      1104          MVC   HH(4,XR2),PA(,XR2)       MOVE PHYSICAL ADDRESS TO DDCF
   12CC 8C 02 13 188A    1105          MVC   DL(3,XR2),P8             MOVE RO KL & DL TO DDCF
                         1106 *
   12D1 F2 87 0A         1107          J     WRR00A                   GO TO EXECUTE COMMAND
                         1108 *
                         1109 *-------------------------------------------------------------
                         1110 *                WRITE RECORD ZERO KEY-DATA ODD
                         1111 *
   12D4 34 08 12F8       1112 WRR00    ST    WRR00X+3,ARR            SAVE RETURN ADDRESS
                         1113 *
   12D8 8C 02 05         1114          MVI   Q(,XR2),X'02'           SETUP Q AND R
   12DB 8C 06 06         1115          MVI   R(,XR2),X'06'             BYTES FOR SIO COMMAND
                         1116 *
   12DE C0 87 13E2       1117 WRR00A   B     XEQ                     GO TO EXECUTE COMMAND
                         1118 *
   12E2 8D 08 13 18DD    1119          CLC   DL(9,XR2),RDDCF+8       GO TO ERROR END IF
   12E7 C0 01 161E       1120          BNE   ERR18                     RESIDUAL DDCF IS INCORRECT
                         1121 *
   12EB 0D 01 18C6 18CA  1122          CLC   IDDDR(2),RDDDR          GO TO ERROR END IF
   12F1 C0 01 160E       1123          BNE   ERR16                     RESIDUAL DDDR IS INCORRECT
                         1124 *
   12F5 C0 87 0000       1125 WRR00X   B     *-*                     RETURN TO CALLING ROUTINE
                         1126 *
                         1127 *-------------------------------------------------------------
                         1128 *                WRITE COUNT-KEY-DATA
                         1129 *
   12F9 34 08 1336       1130 WRCKD    ST    WRCKDX+3,ARR            SAVE RETURN ADDRESS
                         1131 *
   12FD 8C 02 05         1132          MVI   Q(,XR2),X'02'           SETUP Q AND R
   1300 8C 02 06         1133          MVI   R(,XR2),X'02'             BYTES FOR SIO COMMAND
                         1134 *
   1303 35 01 1336       1135 WRCKDA   L     WRCKDX+3,XR1              MOVE RECORD
   1307 9C 00 10 00      1136          MVC   RR(1,XR2),0(,XR1)           NUMBER AND NN
   1308 9C 00 14 01      1137          MVC   NN(1,XR2),1(,XR1)             VALUE TO DDCF
                         1138 *
   130F C0 87 13E2       1139          B     XEQ                     GO TO EXECUTE COMMAND
                         1140 *
   1313 AE 00 10 14      1141          ALC   RR(1,XR2),NN(,XR2)      CALCULATE EXPECTED
   1317 8C FF 14         1142          MVI   NN(,XR2),X'FF'            RESIDUAL RR AND NN VALUES
                         1143 *
   131A 8D 08 13 18DD    1144          CLC   DL(9,XR2),RDDCF+8       GO TO ERROR END IF
   131F C0 01 161E       1145          BNE   ERR18                     RESIDUAL DDCF IS INCORRECT
                         1146 *
   1323 0D 01 18C6 18CA  1147          CLC   IDDDR(2),RDDDR          GO TO ERROR END IF
   1329 C0 01 160E       1148          BNE   ERR16                     RESIDUAL DDDR IS INCORRECT
                         1149 *
   132D 0E 01 1336 1880  1150          ALC   WRCKDX+3(2),P2          SETUP RETURN ADDRESS
                         1151 *
   1333 C0 87 0000       1152 WRCKDX   B     *-*                     RETURN TO CALLING ROUTINE
                         1153 *
   1337 C0 87 1303       1154          B     WRCKDA                  GO TO EXECUTE COMMAND
                         1155 *
                         1156 *-------------------------------------------------------------
                         1157 *                WRITE REPEAT KEY-DATA
                         1158 *
   133B 34 08 137B       1159 WRREP    ST    WRREPX+3,ARR            SAVE RETURN ADDRESS
                         1160 *
   133F 8C 02 05         1161          MVI   Q(,XR2),X'02'           SETUP Q AND R
   1342 8C 03 06         1162          MVI   R(,XR2),X'03'             BYTES FOR SIO COMMAND
                         1163 *
   1345 35 01 137B       1164          L     WRREPX+3,XR1              MOVE RECORD
   1349 9C 00 10 00      1165          MVC   RR(1,XR2),0(,XR1)           NUMBER AND NN
   134D 9C 00 14 01      1166          MVC   NN(1,XR2),1(,XR1)             VALUE TO DDCF
                         1167 *
   1351 C0 87 13E2       1168          B     XEQ                     GO TO EXECUTE COMMAND
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1169 *
 1355 AE 00 10 14        1170          ALC   RR(1,XR2),NN(,XR2)       CALCULATE EXPECTED
 1359 BC FF 14           1171          MVI   NN(,XR2),X'FF'            RESIDUAL RR AND NN VALUES
                         1172 *
 135C 8D 08 13 18DD      1173          CLC   DL(9,XR2),RDDCF+8       GO TO ERROR END IF
 1361 C0 01 161E         1174          BNE   ERR18                     RESIDUAL DDCF IS INCORRECT
                         1175 *
 1365 BC 00 10           1176          MVI   RR(,XR2),0              CLEAR RR FIELD
                         1177 *
 1368 0D 01 18C6 18CA    1178          CLC   IDDDR(2),RDDDR          GO TO ERROR END IF
 136E C0 01 160E         1179          BNE   ERR16                     RESIDUAL DDDR IS INCORRECT
                         1180 *
 1372 0E 01 137B 1880    1181          ALC   WRREPX+3(2),P2          SETUP RETURN ADDRESS
                         1182 *
 1378 C0 87 0000         1183 WRREPX   B     *-*                     RETURN TO CALLING ROUTINE
                         1184 *
                         1185 *-------------------------------------------------------------------
                         1186 *                WRITE KEY-DATA
                         1187 *
 137C 34 08 1217         1188 WRKD     ST    RDKDX+3,ARR             SAVE RETURN ADDRESS
                         1189 *
 1380 BC 02 05           1190          MVI   Q(,XR2),X'02'           SETUP Q AND R
 1383 BC 00 06           1191          MVI   R(,XR2),X'00'             BYTES FOR SIO COMMAND
                         1192 *
 1386 C0 87 11C5         1193          B     RDKDA                   GO TO EXECUTE COMMAND
                         1194 *
                         1195 *-------------------------------------------------------------------
                         1196 *                SCAN EQUAL
                         1197 *
 138A 34 08 13C5         1198 SCANE    ST    SCANHX+3,ARR            SAVE RETURN ADDRESS
                         1199 *
 138E BC 03 05           1200          MVI   Q(,XR2),X'03'           SETUP Q AND R
 1391 BC 00 06           1201          MVI   R(,XR2),X'00'             BYTES FOR SIO COMMAND
                         1202 *
 1394 C0 87 13A2         1203          B     SCANHA                  GO TO EXECUTE COMMAND
                         1204 *
                         1205 *-------------------------------------------------------------------
                         1206 *                SCAN HIGH OR EQUAL
                         1207 *
 13A8 34 08 13C5         1208 SCANH    ST    SCANHX+3,ARR            SAVE RETURN ADDRESS
                         1209 *
 139C BC 03 05           1210          MVI   Q(,XR2),X'03'           SETUP Q AND R
 139F BC 02 06           1211          MVI   R(,XR2),X'02'             BYTES FOR SIO COMMAND
                         1212 *
 13A2 35 01 13C5         1213 SCANHA   L     SCANHX+3,XR1             MOVE RECORD
 13A6 9C 00 10 00        1214          MVC   RR(1,XR2),0(,XR1)         NUMBER AND NN
 13AA 9C 00 14 01        1215          MVC   NN(1,XR2),1(,XR1)           VALUE TO DDCF
                         1216 *
 13AE C0 87 13E2         1217          B     XEQ                     GO TO EXECUTE COMMAND
                         1218 *
 13B2 0D 01 18C6 18CA    1219          CLC   IDDDR(2),RDDDR          GO TO ERROR END IF
 13B8 C0 01 160E         1220          BNE   ERR16                     RESIDUAL DDDR IS INCORRECT
                         1221 *
 13BC 0E 01 13C5 1880    1222          ALC   SCANHX+3(2),P2          SETUP RETURN ADDRESS
                         1223 *
 13C2 C0 87 0000         1224 SCANHX   B     *-*                     RETURN TO CALLING ROUTINE
                         1225 *
                         1226 *
                         1227 *-------------------------------------------------- *
                         1228 *                 SCAN READ OR EQUAL
                         1229 *
 13C6 34 08 13C5         1230 SCNRE    ST    SCANHX+3,ARR          SCAN RETURN ADDRESS
                         1231 *
 13CA BC 03 05           1232          MVI   Q(,XR2),X'03'         SET UP Q AND R
 13CD BC 0C 06           1233          MVI   R(,XR2),X'0C'           BYTES FOR SIO COMMAND
                         1234 *
 13D0 C0 87 13A2         1235          B     SCANHA                GO TO EXECUTE COMMAND
                         1236 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1237 *-------------------------------------------------------------------
                         1238 *                SCAN READ OR HIGH OR EQUAL
                         1239 *
 13D4 34 08 13C5         1240 SCNRH    ST    SCANHX+3,ARR            SAVE RETURN ADDRESS
                         1241 *
 13D8 BC 03 05           1242          MVI   Q(,XR2),X'03'           SET UP Q AND R
 13DB BC 0D 06           1243          MVI   R(,XR2),X'0D'             BYTES FOR SIO COMMAND
                         1244 *
 13DE C0 87 13A2         1245          B     SCANHA
                         1246 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1248 ************************************************************************
                         1249 *                                                                      *
                         1250 *              COMMON 3340 COMMAND EXECUTION SUBROUTINE                *
                         1251 *                                                                      *
                         1252 ************************************************************************
                         1253 *
 13E2 34 08 152D         1254 XEQ      ST    XEQX+3,ARR              SAVE RETURN ADDRESS
                         1255 *
 13E6 3C 80 1486         1256          MVI   BRANCH+1,X'80'          NO-OP THE INSTRUCTIONS
 13EA 3C 80 1492         1257          MVI   JMP+1,X'80'
 13EE 0D 01 0A01 0A01    1258          CLC   PID(2),IDADR            IS IT RUNNING STANDALONE
 13F4 F2 01 12           1259          JNE   XEQ00
 13F7 3C 10 1492         1260          MVI   JMP+1,X'10'             IF RUNNING STANDALONE, CHECK
 13FB 3C 87 1486         1261          MVI   BRANCH+1,X'87'           ATTACHMENT AND SEEK BUSY
                         1262 *
 13FF C0 87 0212         1263          B     TEST                    GO TO CHECK SNS SWS
                         1264 *
 1403 0C 01 18E0 187C    1265          MVC   SNS(2),NULLS            CLEAR SENSE AREA
                         1266 *
 1409 F3 C4 80           1267 XEQ00    SIO   X'80',X'C4'             ENABLE 3340 INTERRUPTS
                         1268 *
 140C 2C 01 1476 06      1269          MVC   SIO+2,R(2,XR2)          MOVE Q AND R BYTES TO SIO
 1411 2E 00 1475 01      1270          ALC   SIO+1,DRVADR(1,XR2)     ADD DRIVE ADDRESS TO Q BYTE
                         1271 *
 1416 2C 00 1471 01      1272          MVC   TIORDY+1(1),DRVADR(,XR2) SETUP Q BYTE IN TIO
 141B 2C 00 148A 01      1273          MVC   TIOBSY+1(1),DRVADR(,XR2)  'NOT RDY / UNIT CHECK' AND
 1420 3A 01 148A         1274          SBN   TIOBSY+1,X'01'             'SEEK BUSY' INSTRUCTIONS
                         1275 *
 1424 2C 09 18D4 14      1276          MVC   IDDCFN,NN(10,XR2)       SAVE INITIAL DDCF
                         1277 *
 1429 35 01 18C4         1278          L     IDDCR,XR1               MOVE DDCF
 142D 6C 09 09 14        1279          MVC   9(10,XR1),NN(,XR2)       TO EXECUTION AREA
                         1280 *
 1431 C1 C2 152E         1281 TIO      TIO   ERR01,X'C2'             ERR IF ATTACHMENT BUSY
                         1282 *
 1435 31 C6 18C4         1283 LIO      LIO   IDDCR,X'C6'             LOAD DDCF ADDRESS IN DDCR
 1439 31 C4 18C6         1284          LIO   IDDDR,X'C4'             LOAD DDDF ADDRESS IN DDDR
                         1285 *
 143D 30 C6 18C8         1286          SNS   RDDCR,X'C6'             SENSE DDCR
 1441 30 C4 18CA         1287          SNS   RDDDR,X'C4'             SENSE DDDR
                         1288 *
 1445 0D 01 18C6 18CA    1289          CLC   IDDDR(2),RDDDR          ERROR END IF
 144B F2 01 E7           1290          JNE   ERR02                    DDCR INCORRECT
                         1291 *
 144E 0D 01 18C6 18CA    1292          CLC   IDDDR(2),RDDDR          ERROR END IF
 1454 C0 01 153C         1293          BNE   ERR03                    DDDR INCORRECT
                         1294 *
 1458 B8 04 05           1295          TBN   Q(,XR2),BIT5            BRANCH IF
 145B F2 10 12           1296          JT    TIORDY                   READ IPL COMMAND
                         1297 *
 145E 3A 04 18AF         1298          SBN   IND,OPEND               SET OP END EXPECTED INDICATOR
                         1299 *
 1462 BD 00 05           1300          CLI   Q(,XR2),0               BRANCH IF NOT
 1465 F2 01 08           1301          JNE   TIORDY                   RECAL OR SEEK COMMAND
                         1302 *
 1468 3B 04 18AF         1303          SBF   IND,OPEND               RESET OP END EXPECTED INDICATOR
 146C 3A 02 18AF         1304          SBN   IND,SKEND               SET SEEK COMPLETE EXP INDICATOR
                         1305 *
 1470 C1 00 1552         1306 TIORDY   TIO   ERR05,*-*               ERROR END IF DRIVE NOT READY
                         1307 *
 1474 F3 00 00           1308 SIO      SIO   *-*,*-*                 ISSUE 3340 START I/O COMMAND
                         1309 *
 1477 0D 01 0A01 0A01    1310          CLC   PID(2),IDADR            NO TEST FOR ATTACHMENT BUSY
 147D C0 01 1489         1311          BNE   TIOBSY                  IF RUNNING SYSTEM TEST
                         1312 *
 1481 C1 C2 1489         1313          TIO   TIOBSY,X'C2'            ERROR END IF
 1485 C0 00 155A         1314 BRANCH   8C    ERR06,X'00'              ATTACHMENT DID NOT GO BUSY
                         1315 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1489 C1 00 1497         1316 TIOBSY   TIO   XEQ01,*-*               BRANCH IF SEEK BUSY
                         1317 *
 148D 38 02 18AF         1318          TBN   IND,SKEND               ERROR END IF
 1491 F2 00 CD           1319 JMP      JC    ERR07,X'00'              SEEK IN PROGRESS
                         1320 *
 1494 F2 87 11           1321          J     XEQ02
                         1322 *
 1497 38 02 18AF         1323 XEQ01    TBN   IND,SKEND               SKIP IF
 149B F2 10 0A           1324          JT    XEQ02                    SEEK IN PROGRESS
                         1325 *
 149E 0C 00 14A5 148A    1326          MVC   *+7(1),TIOBSY+1         ERROR END IF
 14A4 C1 00 1568         1327          TIO   ERR08,*-*                STILL SEEK BUSY
                         1328 *
 14A8 0C 01 18B5 187C    1329 XEQ02    MVC   TIMER(2),NULLS          INITIALIZE TIMER COUNT
                         1330 *
 14AE 3D 00 18B5         1331 XEQ02A   CLI   TIMER,0                 SKIP IF LOW ORDER
 14B2 F2 01 0A           1332          JNE   XEQ03                    TIMER BYTE NOT ZERO
                         1333 *
 14B5 0D 01 0A01 0A01    1334          CLC   PID(2),IDADR            GO TO SUPERVISOR
 14BB C0 01 0A0A         1335          BNE   ENTRY                    IF RUNNING SYSTEM TEST
                         1336 *
 14BF 0E 01 18B5 1880    1337 XEQ03    ALC   TIMER(2),P2              ERROR END IF ATTACHMENT
 14C5 C0 A0 1586         1338          BOL   ERR09                    BUSY FAILS TO GO OFF
 14C9 C1 C2 14AE         1339          TIO   XEQ02A,X'C2'
                         1340 *
 14CD 30 C6 18C8         1341          SNS   RDDCR,X'C6'             SENSE DDCR
 14D1 30 C4 18CA         1342          SNS   RDDDR,X'C4'             SENSE DDDR
                         1343 *
 14D5 0C 01 18B5 187C    1344          MVC   TIMER(2),NULLS          INITIALIZE TIMER COUNT
                         1345 *
 14DB 30 00 18B5         1346 XEQ03A   CLI   TIMER,0                 SKIP IF LOW ORDER
 14DF F2 01 0A           1347          JNE   XEQ04                    TIMER BYTE NOT ZERO
                         1348 *
 14E2 0D 01 0A01 0A01    1349          CLC   PID(2),IDADR            GO TO SUPERVISOR
 14E8 C0 01 0A0A         1350          BNE   ENTRY                    IF RUNNING SYSTEM TEST
                         1351 *
 14EC 0E 01 18B5 1880    1352 XEQ04    ALC   TIMER(2),P2              ERROR END IF EXPECTED
 14F2 C0 A0 15D9         1353          BOL   ERR10                    INTERRUPTS FAIL TO OCCUR
 14F6 C1 C4 14FE         1354          TIO   XEQ04A,X'C4'            INTERRUPT PENDING
                         1355 *
 14FA C0 87 14DB         1356          B     XEQ03A
                         1357 *
 14FE C0 87 1778         1358 XEQ04A   B     DASDI
                         1359 *
 1502 0D 01 0A01 0A01    1360 XEQ05    CLC   PID(2),IDADR            GO TO SUPERVISOR
 1508 C0 01 0A0A         1361          BNE   ENTRY                    IF RUNNING SYSTEM TEST
                         1362 *
 150C 38 20 18AF         1363          TBN   IND,INTERR              BRANCH IF ERROR
 1510 C0 10 1645         1364          BT    ERRXX                    DETECTED IN INTERRUPT RTN
                         1365 *
 1514 35 01 18C4         1366          L     IDDCR,XR1               SAVE
 1518 1C 09 18DE 09      1367          MVC   RDDCFN,9(10,XR1)         RESIDUAL DDCF
                         1368 *
 151D 0D 01 18C4 18C8    1369          CLC   IDDCR(2),RDDCR          GO TO ERROR END IF
 1523 C0 01 1616         1370          BNE   ERR17                    RESIDUAL DDCR IS INCORRECT
                         1371 *
 1527 F3 C4 7E           1372          SIO   X'7E',X'C4'             RESET AND DISABLE INTERRUPTS
                         1373 *
 152A C0 87 0000         1374 XEQX     B     *-*                     RETURN TO CALLING ROUTINE
                         1375 *
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         1377 ********************************************************************
                         1378 *                                                                  *
                         1379 *                    ERROR ENDING CONDITIONS                       *
                         1380 *                                                                  *
                         1381 ********************************************************************
                         1382 *
                         1383 *              ATTACHMENT BUSY PRIOR TO COMMAND EXECUTION
                         1384 *
 152E 3C 01 18B3         1385 ERR01    MVI   ERRID,X'01'             SETUP ERROR NUMBER
 1532 F2 87 55           1386          J     ERR09B
                         1387 *
                         1388 *-------------------------------------------------------------------
                         1389 *              DDCR FAILED TO LOAD CORRECTLY
                         1390 *
 1535 3C 02 18B3         1391 ERR02    MVI   ERRID,X'02'             SETUP ERROR NUMBER
 1539 F2 87 04           1392          J     ERR03A
                         1393 *
                         1394 *-------------------------------------------------------------------
                         1395 *              DDDR FAILED TO LOAD CORRECTLY
                         1396 *
 153C 3C 03 18B3         1397 ERR03    MVI   ERRID,X'03'             SETUP ERROR NUMBER
                         1398 *
 1540 F3 C4 02.          1399 ERR03A   SIO   X'02',X'C4'             DISABLE 3340 INTERRUPTS
 1543 30 C5 18E0         1400          SNS   SNS,X'C5'               SENSE ATTACHMENT STATUS
                         1401 *
 1547 38 01 18E0         1402          TBN   SNS,BIT7                BRANCH IF
 154B F2 10 4E           1403          JT    ERR0C                     ADAPTER CHECK
                         1404 *
 154E C0 87 16FD         1405          B     LOGERR                  GO TO LOG ERROR
                         1406 *
                         1407 *-------------------------------------------------------------------
                         1408 *              UNIT CHECK OR NOT READY PRIOR TO SIO
                         1409 *
 1552 3C 05 18B3         1410 ERR05    MVI   ERRID,X'05'             SETUP ERROR NUMBER
 1556 C0 87 1645         1411          B     ERRXX
                         1412 *
                         1413 *-------------------------------------------------------------------
                         1414 *              ATTACHMENT DID NOT GO BUSY AFTER SIO
                         1415 *
 155A 3C 06 18B3         1416 ERR06    MVI   ERRID,X'06'             SETUP ERROR NUMBER
 155E F2 87 0B           1417          J     ERR08A
                         1418 *
                         1419 *-------------------------------------------------------------------
                         1420 *              SEEK COMMAND DID NOT SET SEEK BUSY
                         1421 *
 1561 3C 07 18B3         1422 ERR07    MVI   ERRID,X'07'             SETUP ERROR NUMBER
 1565 F2 87 04           1423          J     ERR08A
                         1424 *
                         1425 *-------------------------------------------------------------------
                         1426 *              SEEK BUSY WITH NO SEEK IN PROGRESS
                         1427 *
 1568 3C 08 18B3         1428 ERR08    MVI   ERRID,X'08'             SETUP ERROR NUMBER
                         1429 *
 156C 0C 01 18B5 187C    1430 ERR08A   MVC   TIMER(2),NULLS           INITIALIZE TIMER COUNT
                         1431 *
 1572 39 06 18AF         1432 ERR08B   TBF   IND,OPEND+SKEND          LOOP UNTIL
 1576 F2 10 0A           1433          JT    ERR08C                    COUNTER OVERFLOWS
 1579 0E 01 18B5 187E    1434          ALC   TIMER(2),P1                 OR ALL EXPECTED
 157F C0 20 1572         1435          BNOL  ERR08B                       INTERRUPTS HAVE OCCURRED
                         1436 *
 1583 F2 87 04           1437 ERR08C   J     ERR09B
                         1438 *
                         1439 *-------------------------------------------------------------------
                         1440 *              ATTACHMENT BUSY FAILED TO GO OFF
                         1441 *
 1586 3C 09 18B3         1442 ERR09    MVI   ERRID,X'09'             SETUP ERROR NUMBER
                         1443 *
 158A F3 C4 7E           1444 ERR09B   SIO   X'7E',X'C4'             RESET AND DISABLE INTERRUPTS
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
 158D 3B 20 18AF         1445          SBF   IND,INTERR              IGNORE INTERRUPT ERRORS
                         1446 *
 1591 F2 87 B1           1447          J     ERRXX
                         1448 *
                         1449 *-------------------------------------------------------------------
                         1450 *              DRIVE X UNIT CHECK OR NO-OP STATUS
                         1451 *
 1594 3C 0A 18B3         1452 ERR0A    MVI   ERRID,X'0A'             SETUP ERROR NUMBER
 1598 C0 87 16FD         1453          B     LOGERR                  GO TO LOG ERROR
                         1454 *
                         1455 *-------------------------------------------------------------------
                         1456 *              ADAPTER CHECK
                         1457 *
 159C 3C 0C 18B3         1458 ERR0C    MVI   ERRID,X'0C'             SETUP ERROR NUMBER
                         1459 *
 15A0 0C 01 18E4 18E0    1460          MVC   WORKN(2),SNS            SAVE SENSE BYTES AND
 15A6 F2 87 0C           1461          J     ERR0FA                    GO TO BUILD FMT 3 SENSE DATA
                         1462 *
                         1463 *-------------------------------------------------------------------
                         1464 *              ADAPTER SENSE BYTES DO NOT INDICATE CAUSE OF INTERRUPT
                         1465 *
 15A9 3C 0E 18B3         1466 ERR0E    MVI   ERRID,X'0E'             SETUP ERROR NUMBER
 15AD C0 87 16FD         1467          B     LOGERR                  GO TO LOG ERROR
                         1468 *
                         1469 *-------------------------------------------------------------------
                         1470 *              ADAPTER CHECK ON READ DIAGNOSTIC SENSE COMMAND
                         1471 *
 15B1 3C 0F 18B3         1472 ERR0F    MVI   ERRID,X'0F'             SETUP ERROR NUMBER
                         1473 *
 15B5 3C 00 1935         1474 ERR0FA   MVI   DDDF+23,0               CLEAR READ
 15B9 0C 16 1934 1935    1475          MVC   DDDF+22(23),DDDF+23       DIAG SENSE DATA AREA
                         1476 *
 15BF 0C 01 191F 18E4    1477          MVC   DDDF+1(2),WORKN         BUILD
 15C5 31 C7 18AE         1478          LIO   SNS23,X'C7'               FORMAT 3
 15C9 30 C7 1921         1479          SNS   DDDF+3,X'C7'                DIAGNOSTIC
 15CD 3C 30 1925         1480          MVI   DDDF+7,X'30'                  SENSE DATA
                         1481 *
 15D1 3A 01 18AF         1482          SBN   IND,SNSAVL              SET SENSE DATA AVAILABLE IND
                         1483 *
 15D5 C0 87 16FD         1484          B     LOGERR                  GO TO LOG ERROR
                         1485 *
                         1486 *-------------------------------------------------------------------
                         1487 *              EXPECTED OP END INTERRUPT DID NOT OCCUR
                         1488 *
 15D9 C1 C4 15F2         1489 ERR10    TIO   ERR12,X'C4'             BRANCH IF INTERRUPT PENDING
                         1490 *
 15DD 38 04 18AF         1491          TBN   IND,OPEND               BRANCH IF NO OP END
 15E1 F2 90 07           1492          JF    ERR11                     INTERRUPT OUTSTANDING
                         1493 *
 15E4 3C 10 18B3         1494          MVI   ERRID,X'10'             SETUP ERROR NUMBER
                         1495 *
 15E8 F2 87 5A           1496          J     ERRXX
                         1497 *
                         1498 *-------------------------------------------------------------------
                         1499 *              EXPECTED SEEK COMPLETE INTERRUPT DID NOT OCCUR
                         1500 *
 15EB 3C 11 18B3         1501 ERR11    MVI   ERRID,X'11'             SETUP ERROR NUMBER
 15EF F2 87 53           1502          J     ERRXX
                         1503 *
                         1504 *-------------------------------------------------------------------
                         1505 *              INTERRUPT PENDING, BUT INTERRUPT DID NOT OCCUR
                         1506 *
 15F2 3C 12 18B3         1507 ERR12    MVI   ERRID,X'12'             SETUP ERROR NUMBER
 15F6 F2 87 4C           1508          J     ERRXX
                         1509 *
                         1510 *------ -------------------------------------------------------------
                         1511 *              EXPECTED SCAN EQUAL DID NOT OCCUR
                         1512 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   15F9 3C 13 18B3          1513 ERR13    MVI   ERRID,X'13'             SETUP ERROR NUMBER
   15FD F2 87 45            1514          J     ERRXX
                            1515 *
                            1516 *-------------------------------------------------------------------
                            1517 *              EXPECTED SCAN HIT DID NOT OCCUR
                            1518 *
   1600 3C 14 18B3          1519 ERR14    MVI   ERRID,X'14'             SETUP ERROR NUMBER
   1604 F2 87 3E            1520          J     ERRXX
                            1521 *
                            1522 *-------------------------------------------------------------------
                            1523 *              UNEXPECTED SCAN HIT CONDITION
                            1524 *
   1607 3C 15 18B3          1525 ERR15    MVI   ERRID,X'15'             SETUP ERROR NUMBER
   160B F2 87 37            1526          J     ERRXX
                            1527 *
                            1528 *-------------------------------------------------------------------
                            1529 *              INCORRECT RESIDUAL DDDR
                            1530 *
   160E 3C 16 18B3          1531 ERR16    MVI   ERRID,X'16'             SETUP ERROR NUMBER
   1612 C0 87 16FD          1532          B     LOGERR                  GO TO LOG ERROR
                            1533 *
                            1534 *-------------------------------------------------------------------
                            1535 *              INCORRECT RESIDUAL DDCR
                            1536 *
   1616 3C 17 18B3          1537 ERR17    MVI   ERRID,X'17'             SETUP ERROR NUMBER
   161A C0 87 16FD          1538          B     LOGERR                  GO TO LOG ERROR
                            1539 *
                            1540 *-------------------------------------------------------------------
                            1541 *              INCORRECT RESIDUAL DDCF
                            1542 *
   161E 3C 18 18B3          1543 ERR18    MVI   ERRID,X'18'             SETUP ERROR NUMBER
   1622 C0 87 16FD          1544          B     LOGERR                  GO TO LOG ERROR
                            1545 *
                            1546 *-------------------------------------------------------------------
                            1547 *              INCORRECT RESIDUAL DDDF
                            1548 *
   1626 3C 19 18B3          1549 ERR19    MVI   ERRID,X'19'             SETUP ERROR NUMBER
   162A C0 87 16FD          1550          B     LOGERR                  GO TO LOG ERROR
                            1551 *
                            1552 *-------------------------------------------------------------------
                            1553 *              UNEXPECTED SCAN EQUAL CONDITION
                            1554 *
   162E 3C 1A 18B3          1555 ERR1A    MVI   ERRID,X'1A'             SETUP ERROR NUMBER
   1632 F2 87 10            1556          J     ERRXX
                            1557 *
                            1558 *-------------------------------------------------------------------
                            1559 *              INTERRUPT DID NOT CAUSE INTERRUPT PENDING TIO CONDITION
                            1560 *
   1635 3C 1C 18B3          1561 ERR1C    MVI   ERRID,X'1C'             SETUP ERROR NUMBER
   1639 C0 87 16FD          1562          B     LOGERR                  GO TO LOG ERROR
                            1563 *
                            1564 *-------------------------------------------------------------------
                            1565 *              UNEXPECTED INTERRUPT
                            1566 *
   163D 3C 1E 18B3          1567 ERR1E    MVI   ERRID,X'1E'             SETUP ERROR NUMBER
   1641 C0 87 16FD          1568          B     LOGERR                  GO TO LOG ERROR
                            1569 *
                            1570 *-------------------------------------------------------------------
                            1571 *              COMPLETE ERROR PROCESSING
                            1572 *
   1645 F3 C4 7E            1573 ERRXX    SIO   X'7E',X'C4'             RESET AND DISABLE INTERRUPTS
                            1574 *
   1648 38 20 18AF          1575          TBN   IND,INTERR              BRANCH IF INTERRUPT
   164C F2 10 0D            1576          JT    ERRXXA                    DETECTED ERROR CONDITION
                            1577 *
   164F 0D 01 18E0 187C     1578          CLC   SNS(2),NULLS            BRANCH IF SENSE BYTES
   1655 F2 01 04            1579          JNE   ERRXXA                    HAVE ALREADY BEEN RETRIEVED
                            1580 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   1658 30 C5 18E0          1581          SNS   SNS,X'C5'               SENSE ADAPTER STATUS
                            1582 *
   165C 38 01 18E0          1583 ERRXXA   TBN   SNS,BIT7                BRANCH IF
   1660 C0 10 159C          1584          BT    ERROC                     ADAPTER CHECK
                            1585 *
   1664 0C 00 166B 1471     1586          MVC   *+7(1),TIORDY+1         GO TO READ DIAGNOSTIC
   166A C1 00 167A          1587          TIO   ERRXXB,*-*                SENSE DATA IF DRV NOT READY
                            1588 *
   166E 2C 00 1674 03       1589          MVC   *+6,UCKMSK(1,XR2)       BYPASS READ
   1673 39 00 18DF          1590          TBF   SNS-1,*-*                 DIAGNOSTIC SENSE
   1677 F2 10 4F            1591          JT    ERRXXD                      IF NO UNIT CHECK
                            1592 *
   167A 2C 00 1699 01       1593 ERRXXB   MVC   SIOSNS+1,DRVADR(1,XR2)   BUILD READ
   167F 3A 01 1699          1594          SBN   SIOSNS+1,BIT7               DIAGNOSTIC SENSE COMMAND
                            1595 *
   1683 C1 C2 16C9          1596          TIO   ERRXXD,X'C2'            SKIP IF ATTACHMENT BUSY
                            1597 *
   1687 31 C4 18A2          1598          LIO   DGSNSA,X'C4'            LOAD DDDR TO SENSE AREA ADDR
                            1599 *
   168B 30 C4 18E4          1600          SNS   WORKN,X'C4'             BYPASS READ
   168F 0D 01 18E4 18A2     1601          CLC   WORKN(2),DGSNSA           DIAGNOSTIC SENSE
   1695 F2 01 31            1602          JNE   ERRXXD                      IF INCORRECT DDDR LOAD
                            1603 *
   1698 F3 00 07            1604 SIOSNS   SIO   X'07',*-*                READ DIAGNOSTIC SENSE DATA
                            1605 *
   169B 0C 01 18B5 187C     1606          MVC   TIMER(2),NULLS          INITIALIZE TIMER COUNT
                            1607 *
   16A1 0D 01 0A01 0A01     1608          CLC   PID(2),IDADR            GO TO SUPERVISOR
   16A7 C0 01 0A0A          1609          BNE   ENTRY                     IF RUNNING SYSTEM TEST
                            1610 *
   16AB 0E 01 18B5 187E     1611 ERRXXC   ALC   TIMER(2),P1             WAIT FOR FALL OF
   16B1 C0 A0 16C9          1612          BOL   ERRXXD                    ATTACHMENT BUSY
   16B5 C1 C2 16AB          1613          TIO   ERRXXC,X'C2'                OR TIMEOUT
                            1614 *
   16B9 3A 01 18AF          1615          SBN   IND,SNSAVL              SET SENSE DATA AVAILABLE IND
                            1616 *
   16BD 30 C5 18E4          1617          SNS   WORKN,X'C5'             BRANCH IF READ
   16C1 38 01 18E4          1618          TBN   WORKN,BIT7                DIAGNOSTIC SENSE
   16C5 C0 10 15B1          1619          BT    ERR0F                       ENDED IN ADAPTER CHECK
                            1620 *
   16C9 38 20 18AF          1621 ERRXXD   TBN   IND,INTERR              GO TO LOG ERROR
   16CD C0 90 16FD          1622          BF    LOGERR                    NOT INTERRUPT DETECTED ERROR
                            1623 *
   16D1 38 08 18AF          1624          TBN   IND,TIOERR              BRANCH IF
   16D5 C0 10 1635          1625          BT    ERR1C                     INTERRUPT PENDING FAILURE
                            1626 *
   16D9 38 10 18AF          1627          TBN   IND,DRVERR              BRANCH IF
   16DD C0 10 1594          1628          BT    ERR0A                     UNIT CHECK
                            1629 *
   16E1 39 14 18E0          1630          TBF   SNS,BIT3+BIT5           BRANCH IF
   16E5 39 0F 18DF          1631          TBF   SNS-1,X'0F'               NO INTERRUPT
   16E9 C0 10 15A9          1632          BT    ERR0E                       BITS IN ADAPTER STATUS
                            1633 *
   16ED 39 10 18E0          1634          TBF   SNS,BIT3                BRANCH IF
   16F1 39 0F 18DF          1635          TBF   SNS-1,X'0F'               NOT ATTENTION
   16F5 C0 90 163D          1636          BF    ERR1E                       INTERRUPT
                            1637 *
   16F9 C0 87 0F83          1638          B     BGN01                   GO TO RESET ATTENTION
                            1639 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1641 ********************************************************************
                         1642 *                                                                  *
                         1643 *                    ERROR LOG SUBROUTINE                          *
                         1644 *                                                                  *
                         1645 ********************************************************************
                         1646 *
                    17FA 1647          USING LOG,XR1                    XR1 POINTS TO LOG AREA
                         1648 *
  16FD B5 01 16          1649 LOGERR   L     LOGa(,XR2),XR1             SETUP LOG AREA POINTER
                         1650 *
  1700 7C 00 2F          1651          MVI   DGSNS(,XR1),0                    CLEAR DIAGNOSTIC
  1703 5C 16 2E 2F       1652          MVC   DGSNS-1(23,XR1),DGSNS(,XR1)        SENSE DATA AREA
                         1653 *
  1707 38 01 18AF        1654          TBN   IND,SNSAVL                 BRANCH IF NO
  170B F2 90 47          1655          JF    LOGER                        DIAGNOSTIC SENSE DATA
                         1656 *
  170E 4C 17 2F 1935     1657          MVC   DGSNS(24,XR1),DDDF+23      LOG SENSE DATA
                         1658 *
  1713 3D 80 191E        1659          CLI   DDDF,X'80'                 BRANCH IF NOT
  1717 F2 01 1A          1660          JNE   CKRDY                        WRITE INHIBIT
  171A 3D 02 191F        1661          CLI   DDDF+1,X'02'                   COMMAND REJECT
  171E F2 01 13          1662          JNE   CKRDY
                         1663 *
  1721 4C 09 15 1868     1664          MVC   MSG(10,XR1),NWRITE         MOVE WR INHIBIT MSG TO LOG
                         1665 *
  1726 38 40 18B0        1666          TBN   IND2,RDONLY                BYPASS HALT IF
  172A F2 10 40          1667          JT    LOGX                         PREVIOUS RD ONLY DETECTED
                         1668 *
  172D 3A 40 18B0        1669          SBN   IND2,RDONLY                SET READ ONLY INDICATOR AND
  1731 F2 87 2F          1670          J     SETHLT                       GO TO SETUP FOR ERROR HALT
                         1671 *
  1734 3D 40 191E        1672 CKRDY    CLI   DDDF,X'40'                 BRANCH IF
  1738 F2 01 1A          1673          JNE   LOGER                        OTHER THAN
  173B 3D 15 1925        1674          CLI   DDDF+7,X'15'                   NORMAL INTERVENTION
  173F F2 01 13          1675          JNE   LOGER                            REQUIRED CONDITION
                         1676 *
  1742 4C 09 15 185E     1677          MVC   MSG(10,XR1),NRDY           MOVE NOT RDY MSG TO LOG
                         1678 *
  1747 38 80 18B0        1679          TBN   IND2,NOTRDY                BYPASS HALT IF PREVIOUS
  174B F2 10 1F          1680          JT    LOGX                         NOT READY CONDITION DETECTED
                         1681 *
  174E 3A 80 18B0        1682          SBN   IND2,NOTRDY                SET NOT READY INDICATOR AND
  1752 F2 87 0E          1683          J     SETHLT                       GO TO SETUP FOR ERROR HALT
                         1684 *
  1755 C0 87 021E        1685 LOGER    B     UNPACK                     UNPACK
  1759 01                1686          DC    IL1'1'                       ERROR
  175A 18B3              1687          DC    AL2(ERRID)                     IDENTIFIER
  175C 1872              1688          DC    AL2(ERRNO)                       TO PRINT FIELD
                         1689 *
  175E 4C 09 15 1872     1690          MVC   MSG(10,XR1),ERRNO          LOG ERROR IDENTIFIER
                         1691 *
  1763 3A 40 18AF        1692 SETHLT   SBN   IND,HLTSW                  SET ERROR HALT INDICATOR
  1767 0C 00 1053 18B3   1693          MVC   ERRHLT(1),ERRID            SETUP ERROR HALT
                         1694 *
  176D 3B 3F 18AF        1695 LOGX     SBF   IND,X'3F'                  RESET PROGRAM INDICATORS
  1771 BB C0 00          1696          SBF   DIND(,XR2),CEDM+LPSW       RESET DRIVE INDICATORS
                         1697 *
  1774 C0 87 1013        1698          B     NXDRV                      GO TO TRY NEXT DRIVE
                         1699 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1701 ********************************************************************
                         1702 *                                                                  *
                         1703 *              3340 DEVICE END INTERRUPT SUBROUTINE                *
                         1704 *                                                                  *
                         1705 ********************************************************************
                         1706 *
  1778 34 08 17DF        1707 DASDI    ST    DASDIX+3,ARR               SETUP RETURN ADDRESS
  177C 34 02 18B7        1708          ST    DAXR2,XR2                  SAVE INDEX REGISTER 2
                         1709 *
  1780 30 C5 18E0        1710 DASD00   SNS   SNS,X'C5'                  SAVE SENSE BYTES
                         1711 *
  1784 38 01 18E0        1712          TBN   SNS,BIT7                   BRANCH IF
  1788 F2 10 49          1713          JT    DASD04                       ADAPTER CHECK
                         1714 *
  178B 35 02 18B9        1715          L     ADRPTR,XR2
  178F B5 02 01          1716          L     1(,XR2),XR2                SETUP POINTER TO
                         1717 *                                           DRIVE DEPENDENT WORK AREA
  1792 38 10 18E0        1718          TBN   SNS,BIT3                   BRANCH IF
  1796 38 04 18AF        1719          TBN   IND,OPEND                    EXPECTED OP END
  179A F2 10 17          1720          JT    DASD01                         INTERRUPT OCCURRED
                         1721 *
  179D 2C 00 17A3 02     1722          MVC   *+6,SKMSK(1,XR2)           GET SK INTRP MASK FROM DRV AREA
  17A2 38 00 18DF        1723          TBN   SNS-1,*-*                  BRANCH IF
  17A6 38 02 18AF        1724          TBN   IND,SKEND                    INTERRUPT IS
  17AA F2 90 27          1725          JF    DASD04                         NOT EXPECTED
                         1726 *
  17AD 3B 02 18AF        1727          SBF   IND,SKEND                  RESET SEEK INTRP EXPECTED IND
  17B1 F2 87 04          1728          J     DASD02                     GO TO TEST FOR UNIT CHECK
                         1729 *
  17B4 3B 04 18AF        1730 DASD01   SBF   IND,OPEND                  RESET OP END EXPECTED INDICATOR
                         1731 *
  17B8 2C 00 17BE 03     1732 DASD02   MVC   *+6,UCKMSK(1,XR2)          GET UNIT CK MASK FROM DRV AREA
  17BD 39 00 18DF        1733          TBF   SNS-1,*-*                  BRANCH IF
  17C1 39 08 18E0        1734          TBF   SNS,BIT4                     UNIT CHECK OR
  17C5 F2 90 08          1735          JF    DASD03                         NO-OP STATUS
                         1736 *
  17C8 C1 C4 17D8        1737          TIO   DASD05,X'C4'               BR IF INTERRUPT PENDING,
  17CC 3A 08 18AF        1738          SBN   IND,TIOERR                   ELSE SET ERROR INDICATOR
                         1739 *
  17D0 3A 10 18AF        1740 DASD03   SBN   IND,DRVERR                 SET DRIVE ERROR INDICATOR
                         1741 *
  17D4 3A 20 18AF        1742 DASD04   SBN   IND,INTERR                 SET ANY ERROR INDICATOR
                         1743 *
  17D8 35 02 18B7        1744 DASD05   L     DAXR2,XR2                  RESTORE INDEX REGISTER 2
                         1745 *
                         1746 *
  17DC C0 87 0000        1747 DASDIX   B     *-*                        HANDLE NEXT INTERRUPT
                         1748 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1750 ********************************************************************************
                              1751 *                                                                              *
                              1752 *                ERROR LOG AREA AND MESSAGE CONSTANTS                          *
                              1753 *                                                                              *
                              1754 ********************************************************************************
                              1755 *
                         17E0 1756 ERRLOG   EQU   *
                              1757 *
  17E0 80                 17E0 1758         DC    XL1'80'
  17E1 08                 17E1 1759         DC    IL1'8'
  17E2 F3F3F4F040D3D6C7   17E9 1760         DC    CL8'3340 LOG'
                              1761 *
  17EA 80                 17EA 1762 LOG     DC    XL1'80'
  17EB 14                 17EB 1763         DC    IL1'20'
  17EC C4D9C9E5C540F140   17F5 1764         DC    CL10'DRIVE 1 - '
  17F4 6040
  17F6                    17FF 1765 MSG     DS    CL10
  1800 40                 1800 1766         DC    XL1'40'
  1801 18                 1801 1767         DC    IL1'24'
  1802                    1819 1768 DGSNS   DS    XL24
                              1769 *
  181A 80                 181A 1770 LOG2    DC    XL1'80'
  181B 14                 181B 1771         DC    IL1'20'
  181C C4D9C9E5C540F240   1825 1772         DC    CL10'DRIVE 2 - '
  1824 6040
  1826                    182F 1773 MSG2    DS    CL10
  1830 40                 1830 1774         DC    XL1'40'
  1831 18                 1831 1775         DC    IL1'24'
  1832                    1849 1776 DGSNS2  DS    XL24
                              1777 *
  184A FF                 184A 1778         DC    XL1'FF'
                              1779 *
  184B D5D640C5D9D9D6D9   1854 1780 NOERRS   DC    CL10'NO ERRORS '
  1853 E240
  1855 D5D6E340D9C5C1C4   185E 1781 NRDY     DC    CL10'NOT READY '
  185D E840
  185F D9C5C1C440D6D5D3   1868 1782 NWRITE   DC    CL10'READ ONLY '
  1867 E840
  1869 C5D9D940C8D3E340   1872 1783 ERRNO    DC    CL10'ERR HLT XX'
  1871 E7E7
                              1784 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1786 ********************************************************************************
                              1787 *                                                                              *
                              1788 *                CONSTANTS AND RESERVED STORAGE AREAS                          *
                              1789 *                                                                              *
                              1790 ********************************************************************************
                              1791 *
                              1792 *               CONSTANTS
                              1793 *
  1873 0000000G00000000   187C 1794 NULLS    DC    10XL1'00'
  1876 0000                    1794
                              1795 *
                              1796 *
  187D 0001               187E 1797 P1       DC    IL2'1'
  187F 0002               1880 1798 P2       DC    IL2'2'
  1881 0004               1882 1799 P4       DC    IL2'4'
  1883 00000005           1886 1800 P5       DC    IL4'5'
  1887 00000008           188A 1801 P8       DC    IL4'8'
  1888 0014               188C 1802 P20      DC    IL2'20'
  188D 00000100           1890 1803 P256     DC    IL4'256'
  1891 015D               1892 1804 P349     DC    IL2'349'
                              1805 *
  1893 FFFF               1894 1806 N1       DC    IL2'-1'
                              1807 *
  1895 FFFFFFFF           1898 1808 FFPTN    DC    4XL1'FF'          SCAN TEST MASK
  1899 7777FFAA           189C 1809 WCPTN    DC    XL4'7777FFAA'     WORST CASE TEST PATTERN
                              1810 *
                         189D 1811 PATRN    EQU   *
  189D                    18A0 1812         DS    XL4               TEST PATTERN TEMPORARY STORAGE
                              1813 *
  18A1 191E               18A2 1814 DGSNSA   DC    AL2(DDDF)         ADDR OF RD DIAG SENSE AREA
                              1815 *
  18A3 1914               18A4 1816 DDCR     DC    AL2(DDCF)         INITIAL DDCR INITIALIZATIUN VALUE
  18A5 191E               18A6 1817 DDDR     DC    AL2(DDDF)         INITIAL DDDR INITIALIZATION VALUE
                              1818 *
                              1819 *---------------------------------------------------------------------
                              1820 *               SVP INTERFACE CONTROL BYTES
                              1821 *
  18A7 2009               18A8 1822 SYSRST   DC    XL2'2009'           SYS RESET FLAG --> X REG
                              1823 *
  18A9 0003               18AA 1824 SVPREQ   DC    XL2'0003'           SET SVP REQUEST
                              1825 *
  18AB C809               18AC 1826 CEMODE   DC    XL2'C809'           CE MODE INDICATORS --> X REG
                              1827 *
  18AD 0002               18AE 1828 SNS23    DC    XL2'0002'           SENSE ERROR BYTES
                              1829 *
                              1830 *---------------------------------------------------------------------
                              1831 *               COMMON INDICATORS AND WORK AREAS
                              1832 *
  18AF 00                 18AF 1833 IND      DC    XL1'0'            PROGRAM INDICATORS
  18B0 00                 18B0 1834 IND2     DC    XL1'0'
                              1835 *
  18B1                    18B2 1836 LPCNT    DS    XL2               ROUTINE LOOP COUNTER
                              1837 *
  18B3                    18B3 1838 ERRID    DS    XL1               ERROR IDENTIFIER TEMP STORAGE
                              1839 *
  18B4                    18B5 1840 TIMER    DS    XL2               TIMER COUNT
                              1841 *
  18B6                    18B7 1842 DAXR2    DS    XL2               XR2 STORAGE
                              1843 *
  18B8                    18B9 1844 ADRPTR   DS    XL2               DRIVE SELECTION POINTER
                              1845 *
                         18BA 1846 ADRTBL   EQU   *
  18BA                    18C2 1847         DS    XL9               DRIVE SELECTION TABLE
                              1848 *
  18C3                    18C4 1849 IDDCR    DS    XL2               INITIAL DDCR VALUE
  18C5                    18C6 1850 IDDDR    DS    XL2               INITIAL DDDR VALUE
                              1851 *
  18C7                    18C8 1852 RDDCR    DS    XL2               RESIDUAL DDCR VALUE
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   18C9                  18CA 1853 RDDDR    DS    XL2             RESIDUAL DDDR VALUE
                              1854 *
                         18CB 1855 IDDCF    EQU   *               INITIAL DDCF
   18CB                  18D4 1856 IDDCFN   DS    XL10
                              1857 *
                         18D5 1858 RDDCF    EQU   *               RESIDUAL DDCF
   18D5                  18DE 1859 RDDCFN   DS    XL10
                              1860 *
   18DF                  18E0 1861 SNS      DS    XL2             3340 ADAPTER SENSE INFO
                              1862 *
                         18E1 1863 WORK     EQU   *               GENERAL PURPOSE
   18E1                  18E4 1864 WORKN    DS    XL4               WORK AREA
                              1865 *
                         18E5 1866 DRVWK    EQU   *               START OF DRV DEPENDENT WORK AREAS
                              1867 *-------------------------------------------------------------
                              1868 *              DRIVE 1 INDICATORS AND WORK AREAS
                              1869 *
                         18E5 1870 DRVWK1   EQU   *               START OF DRIVE 1 WORK AREA
                              1871 *
   18E5 00               18E5 1872 DIND     DC    XL1'00'         DRIVE DEPENDENT INDICATORS
                              1873 *
   18E6 C0               18E6 1874 DRVADR   DC    XL1'C0'         DRIVE ADDRESS
                              1875 *
   18E7 08               18E7 1876 SKMSK    DC    XL1'08'         SEEK COMPLETE INTERRUPT MASK
   18E8 80               18E8 1877 UCKMSK   DC    XL1'80'         UNIT CHECK MASK
   18E9 40               18E9 1878 SKRST    DC    XL1'40'         SEEK COMPLETE INTERRUPT RESET R BYTE
                              1879 *
   18EA                  18EA 1880 Q        DS    XL1             SIO Q BYTE
   18EB                  18EB 1881 R        DS    XL1             SIO R BYTE
                              1882 *
   18EC                  18EF 1883 PA       DS    XL4             CURRENT PHYSICAL ACCESS POSITION
                              1884 *
   18F0                  18F0 1885 FF       DS    XL1             FLAG VALUE
   18F1                  18F2 1886 CC       DS    XL2             CYLINDER ADDRESS
   18F3                  18F4 1887 HH       DS    XL2             HEAD ADDRESS
   18F5                  18F5 1888 RR       DS    XL1             RECORD NUMBER
   18F6                  18F6 1889 KL       DS    XL1             KEY LENGTH
   18F7                  18F8 1890 DL       DS    XL2             DATA LENGTH
   18F9                  18F9 1891 NN       DS    XL1             NUMBER OF RECORDS
                              1892 *
   18FA 17EA             18FB 1893 LOG@     DC    AL2(LOG)        LOG AREA ADDRESS
                              1894 *
                              1895 *-------------------------------------------------------------
                              1896 *              DRIVE 2 INDICATORS AND WORK AREAS
                              1897 *
                         18FC 1898 DRVWK2   EQU   *               START OF DRIVE 2 WORK AREA
                              1899 *
   18FC 00               18FC 1900 DIND2    DC    XL1'00'         DRIVE DEPENDENT INDICATORS
                              1901 *
   18FD C8               18FD 1902 DRVAD2   DC    XL1'C8'         DRIVE ADDRESS
                              1903 *
   18FE 04               18FE 1904 SKMSK2   DC    XL1'04'         SEEK COMPLETE INTERRUPT MASK
   18FF 40               18FF 1905 UCKMS2   DC    XL1'40'         UNIT CHECK MASK
   1900 20               1900 1906 SKRST2   DC    XL1'20'         SEEK COMPLETE INTERRUPT RESET R BYTE
                              1907 *
   1901                  1901 1908 Q2       DS    XL1             SIO Q BYTE
   1902                  1902 1909 R2       DS    XL1             SIO R BYTE
                              1910 *
   1903                  1906 1911 PA2      DS    XL4             CURRENT PHYSICAL ACCESS POSITION
                              1912 *
   1907                  1907 1913 FF2      DS    XL1             FLAG VALUE
   1908                  1909 1914 CC2      DS    XL2             CYLINDER ADDRESS
   190A                  1908 1915 HH2      DS    XL2             HEAD ADDRESS
   190C                  190C 1916 RR2      DS    XL1             RECORD NUMBER
   190D                  190D 1917 KL2      DS    XL1             KEY LENGTH
   190E                  190F 1918 DL2      DS    XL2             DATA LENGTH
   1910                  1910 1919 NN2      DS    XL1             NUMBER OF RECORDS
                              1920 *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1911 181A             1912 1921 LOG2@    DC    AL2(LOG2)       LOG AREA ADDRESS
                              1922 *
                              1923 *-------------------------------------------------------------
                              1924 *
   1914                       1925         ORG   *+2,0       *** PROGRAM MAINTENANCE NOTE ***   03
                              1926 *                               DDCF AND DDDF MUST START
                              1927 *                               ON EVEN ADDRESS BOUNDARY
                              1928 *
                         1914 1929 DDCF     EQU   *               DDCF AREA
   1914                  191D 1930         DS    XL10
                              1931 *
                         191E 1932 DDDF     EQU   *               DDDF AREA
   191E                  1A21 1933         DS    260XL1
                              1934 *
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1936 ************************************************************************
                         1937 *                                                                      *
                         1938 *                          SYMBOL DEFINITIONS                          *
                         1939 *                                                                      *
                         1940 ************************************************************************
                         1941 *
                         1942 *               LOCAL STORE REGISTERS
                         1943 *
0001                     1944 XR1       EQU   X'01'               INDEX REGISTER 1
0002                     1945 XR2       EQU   X'02'               INDEX REGISTER 2
                         1946 *
0008                     1947 ARR       EQU   X'08'               CURRENT LEVEL ADDRESS RECALL REG
                         1948 *
                         1949 *---------------------------------------------------------------------
                         1950 *               MESSAGE / HALT IDENTIFIERS
                         1951 *
C100                     1952 HLTXX     EQU   X'C100'             COMMON 3340 ERROR HALT
                         1953 *
                         1954 *---------------------------------------------------------------------
                         1955 *               COMMON PROGRAM INDICATORS (IND)                  03
                         1956 *
0080                     1957 BGNSW     EQU   X'80'               PROGRAM RESTART INDICATOR
0040                     1958 HLTSW     EQU   X'40'               ERROR HALT AFTER TESTING ALL DRIVES
0020                     1959 INTERR    EQU   X'20'               ERROR DETECTED IN 3340 INTERRUPT RTN
0010                     1960 DRVERR    EQU   X'10'               UNIT CHECK DETECTED IN INTRP RTN
0008                     1961 TIOERR    EQU   X'08'               TIO INTRP PENDING FAILED
0004                     1962 OPEND     EQU   X'04'               OP END INTERRUPT EXPECTED
0002                     1963 SKEND     EQU   X'02'               SEEK COMPLETE INTERRUPT EXPECTED
0001                     1964 SNSAVL    EQU   X'01'               READ SENSE DATA AVAILABLE
                         1965 *
                         1966 *---------------------------------------------------------------03
                         1967 *               COMMON PROGRAM INDICATORS (IND2)                 03
                         1968 *                                                                03
0080                     1969 NOTRDY    EQU   X'80'               NOT READY DRIVE DETECTED
0040                     1970 RDONLY    EQU   X'40'               READ ONLY DATA MODULE DETECTED
                         1971 *
                         1972 *---------------------------------------------------------------------
                         1973 *               DRIVE DEPENDENT INDICATORS (DIND)
                         1974 *
0080                     1975 CEDM      EQU   X'80'               CE DATA MODULE MOUNTED
0040                     1976 LPSW      EQU   X'40'               DRIVE LOOP INDICATOR
0008                     1977 NOWR      EQU   X'08'               DRIVE WRITE INHIBIT INDICATOR    02
0001                     1978 SW        EQU   X'01'               GENERAL PURPOSE PROGRAM INDICATOR
                         1979 *
                         1980 *---------------------------------------------------------------------
                         1981 *               BIT POSITION SYMBOLS
                         1982 *
0040                     1983 BIT1      EQU   X'40'
0010                     1984 BIT3      EQU   X'10'
0008                     1985 BIT4      EQU   X'08'
0004                     1986 BIT5      EQU   X'04'
0002                     1987 BIT6      EQU   X'02'
0001                     1988 BIT7      EQU   X'01'
                         1989 *
                         1990 *---------------------------------------------------------------------
                         1991 *               DCP SECTION REFERENCE TABLE
                         1992 *
0212                     1993 TEST      EQU   X'0212'             CHECK FOR USER INTERVENTION
0216                     1994 LINK      EQU   X'0216'             TERMINATE SECTION
021E                     1995 UNPACK    EQU   X'021E'             UNPACK DATA - HEX TO EBCDIC
0222                     1996 HALT      EQU   X'0222'             HALT AND DISPLAY HALT IDENTIFIER
                         1997 *
                         1998 *---------------------------------------------------------------------
                         1999 *               OTHER REFERENCES EXTERNAL TO THIS SECTION
                         2000 *
0A01                     2001 IDADR     EQU   X'0A01'             SECTION IDENTIFIER ADDRESS
0A0A                     2002 ENTRY     EQU   X'0A0A'             SUPERVISOR ENTRY
                         2003 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         FFFF 2004          END
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ADRPTR	A	002	18B9	1844	0775* 0790 0798* 0803* 1715
ADRTBL	A	001	18BA	1846	0758 0774 0802
ARR	C	001	0008	1947	0719 0837 0849 0903 0913 0939 0967 0988 1025 1055 1067 1098 1112 1130 1159 1188 1198 1208 1230 1240 1254 1707
BEGIN	A	004	0F6A	0719	0041 0069 0099 0128 0166 0217 0271 0301 0361 0408 0489 0566 0625 0672
BGNSW	C	001	0080	1957	0037 0746 0756
BGNX	A	004	100F	0780	0726* 0824
BGNO1	A	003	0F83	0728	1638
BGNO2	A	004	0FDC	0756	0747
BGNO6	A	003	0FFE	0772	
BIT1	C	001	0040	1983	0459 0469 0520 0541 0591 0604
BIT3	C	001	0010	1984	1630 1634 1718
BIT4	C	001	0008	1985	1734
BIT5	C	001	0004	1986	1295 1630
BIT6	C	001	0002	1987	1075 1079
BIT7	C	001	0001	1988	0475 0508 0523 0547 0548 0613 1402 1583 1594 1618 1712
BRANCH	A	004	1485	1314	1256* 1261*
CC	A	002	18F2	1886	0885*
CC2	A	002	1909	1914	
CEDM	C	001	0080	1975	0856 1077 1696
CEMODE	A	002	18AC	1826	0737
CKRDY	A	004	1734	1672	1660 1662
C1F	A	001	0000	0007	
DASDI	A	004	1778	1707	1358
DASDIX	A	004	17DC	1747	1707*
DASDO0	A	004	1780	1710	
DASDO1	A	004	17B4	1730	1720
DASDO2	A	005	17B8	1732	1728
DASDO3	A	004	17D0	1740	1735
DASDO4	A	004	17D4	1742	1713 1725
DASDO5	A	004	17D8	1744	1737
DAXR2	A	002	18B7	1842	1708* 1744
DDCF	A	001	1914	1929	1816
DDCR	A	002	18A4	1816	0743 0819
DDDF	A	001	191E	1932	0421* 0422 0422* 0423* 0450* 0502* 0503 0503* 0504* 0505* 0506* 0511 0511* 0526 0531 0544 0579* 0580 0580* 0581* 0582* 0594 0607 1474* 1475 1475* 1477* 1479* 1480* 1657 1659 1661 1672 1674 1814 1817
DDDR	A	002	18A6	1817	0744 0820
DGSNS	A	024	1819	1768	0752* 0753 0753* 0754 1651* 1652 1652* 1657*
DGSNS@	A	002	18A2	1814	1598 1601
DGSNS2	A	024	1849	1776	0754*
DIND	A	001	18E5	1872	0228 0278 0308 0636 0764* 0770* 0778* 0822 0823* 0856 1077* 1081* 1696*
DIND2	A	001	18FC	1900	
DL	A	002	18F8	1890	0185 0243 0329 0926* 0949 0956 0979* 1003 1010 1030* 1105* 1119 1144 1173
DL2	A	002	190F	1918	
DRVADR	A	001	18E6	1874	1270 1272 1273 1593
DRVAD2	A	001	18FD	1902	
DRVERR	C	001	0010	1960	1627 1740
DRVWK	A	001	18E5	1866	0026
DRVWK1	A	001	18E5	1870	0760
DRVWK2	A	001	18FC	1898	0766
ENTRY	C	001	0A0A	2002	0741 0788 1335 1350 1361 1609
ERRHLT	A	002	1053	0812	1693*
ERRID	A	001	1883	1838	1385* 1391* 1397* 1410* 1416* 1422* 1428* 1442* 1452* 1458* 1466* 1472* 1494* 1501* 1507* 1513* 1519* 1525* 1531* 1537* 1543* 1549* 1555* 1561* 1567* 1687 1693
ERRLOG	A	001	17E0	1756	0021
ERRNO	A	010	1872	1783	1688 1690
ERRXX	A	003	1645	1573	1364 1411 1447 1496 1502 1508 1514 1520 1526 1556
ERRXXA	A	004	165C	1583	1576 1579
ERRXXB	A	005	167A	1593	1587
ERRXXC	A	006	16AB	1611	1613
ERRXXD	A	004	16C9	1621	1591 1596 1602 1612

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ERR0A	A	004	1594	1452	1628
ERR0C	A	004	159C	1458	1403 1584
ERR0E	A	004	15A9	1466	1632
ERR0F	A	004	15B1	1472	1619
ERR0FA	A	004	15B5	1474	1461
ERR01	A	004	152E	1385	1281
ERR02	A	004	1535	1391	1290
ERR03	A	004	153C	1397	1293
ERR03A	A	003	1540	1399	1392
ERR05	A	004	1552	1410	1306
ERR06	A	004	155A	1416	1314
ERR07	A	004	1561	1422	1319
ERR08	A	004	1568	1428	1327
ERR08A	A	006	156C	1430	1417 1423
ERR08B	A	004	1572	1432	1435
ERR08C	A	003	1583	1437	1433
ERR09	A	004	1586	1442	1338
ERR09B	A	003	158A	1444	1386 1437
ERR1A	A	004	162E	1555	0592 0605
ERR1C	A	004	1635	1561	1625
ERR1E	A	004	163D	1567	1636
ERR10	A	004	15D9	1489	1353
ERR11	A	004	15EB	1501	1492
ERR12	A	004	15F2	1507	1489
ERR13	A	004	15F9	1513	0460 0521 0542
ERR14	A	004	1600	1519	0457 0467 0470 0518 0539 0589 0602
ERR15	A	004	1607	1525	0429 0435 0441 0448
ERR16	A	004	160E	1531	0891 0932 0960 1016 1046 1088 1123 1148 1179 1220
ERR17	A	004	1616	1537	1370
ERR18	A	004	161E	1543	0186 0244 0330 0894 0923 0950 1002 1004 1041 1043 1091 1120 1145 1174
ERR19	A	004	1626	1549	0191 0249 0335 0527 0532 0545 0595 0608
FF	A	001	18F0	1885	
FFPTN	A	001	1898	1808	0526 0531 0594
FF2	A	001	1907	1913	
HALT	C	001	0222	1996	0811
HH	A	002	18F4	1887	0886* 0896 1104*
HH2	A	002	1908	1915	
HLTSW	C	001	0040	1958	0806 0809 1692
HLTXX	C	001	C100	1952	0812
IDADR	C	001	0A01	2001	0740 0787 1258 1310 1334 1349 1360 1608
IDDCF	A	001	18CB	1855	
IDDCFN	A	010	18D4	1856	0893 1090 1276*
IDDCR	A	002	18C4	1849	0144* 0743* 0819* 1278 1283 1366 1369
IDDDR	A	002	18C6	1850	0050* 0145* 0188 0197 0198* 0246 0255 0256* 0332 0341 0342* 0379* 0385* 0508 0523 0547 0548* 0744* 0820* 0890 0925 0954 1008 1045 1074 1083 1122 1147 1178 1219 1284 1289 1292
IND	A	001	18AF	1833	0037* 0746 0756* 0806 0809* 1298* 1303* 1304* 1318 1323 1363 1432 1445* 1482* 1491 1575 1615* 1621 1624 1627 1654 1692* 1695* 1719 1724 1727* 1730* 1738* 1740* 1742*
IND2	A	001	18B0	1834	1666 1669* 1679 1682*
INTERR	C	001	0020	1959	1363 1445 1575 1621 1742
JMP	A	003	1491	1319	1257* 1260*
KL	A	001	18F6	1889	0955 1009
KL2	A	001	190D	1917	
LINK	C	001	0216	1994	
LIO	A	004	1435	1283	
LOG	A	001	17EA	1762	1647 1893
LOG@	A	002	18FB	1893	1649
LOGER	A	004	1755	1685	1655 1673 1675
LOGERR	A	003	16FD	1649	1405 1453 1467 1484 1532 1538 1544 1550 1562 1568 1622
LOGX	A	004	176D	1695	1667 1680
LOG2	A	001	181A	1770	1921
LOG2@	A	002	1912	1921	
LOOP	A	006	1058	0819	0058 0068 0117 0155 0206 0262 0350 0396 0478 0554 0616 0706 0800

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
LOOPX	A	004	106E	0826	0722*
LPCNT	A	002	18B2	1836	0039* 0057* 0215* 0261* 0487* 0553* 0670* 0685 0704* 0705
LPSW	C	001	0040	1976	0778 0822 0823 1696
MSG	A	010	17FF	1765	0749* 1664* 1677* 1690*
MSG2	A	010	182F	1773	0750*
NN	A	001	18F9	1891	0842* 0857* 0918* 0945* 0972* 0995* 0999 1011* 1034* 1038 1103* 1137* 1141 1142* 1166* 1170 1171* 1215* 1276 1279
NN2	A	001	1910	1919	
NOERRS	A	010	1854	1780	0749 0750
NOTRDY	C	001	0080	1969	1679 1682
NOWR	C	001	0008	1977	0228 0278 0308 0636 1081
NRDY	A	010	185E	1781	1677
NULLS	A	001	187C	1794	0506 0667 0842 0867 0918 0972 1030 1103 1265 1329 1344 1430 1578 1606
NWRITE	A	010	1868	1782	1664
NXDRV	A	003	1013	0785	0055 0083 0112 0150 0201 0229 0259 0279 0290 0309 0345 0391 0472 0551 0610 0637 0658 0698 0862 1698
NXDRVX	A	004	1054	0814	0723* 0807
NXD01	A	004	1020	0790	
NXD02	A	004	1038	0802	0793
N1	A	002	1894	1806	1011
OPEND	C	001	0004	1962	1298 1303 1432 1491 1719 1730
PA	A	004	18EF	1883	0896* 0922 1104
PATRN	A	001	189D	1811	0405* 0406* 0423 0474 0474* 0475* 0477 0563* 0564* 0581 0612 0612* 0613* 0615
PA2	A	004	1906	1911	
PFC	A	002	0A07	0020	
PID	A	002	0A01	0016	0669 0702 0740 0787 1258 1310 1334 1349 1360 1608
P1	A	002	167E	1797	0057 0085 0114 0152 0203 0261 0347 0393 0553 0704 0734 0870 0981 1434 1611
P2	A	002	1880	1798	1018 1048 1150 1181 1222 1337 1352
P20	A	002	188C	1802	0879 0882
P256	A	004	1890	1803	0185 0243 0329 0379 0385
P349	A	002	1892	1804	0689
P4	A	002	1882	1799	0194 0252 0338
P5	A	004	1886	1800	
P8	A	004	188A	1801	1105
Q	A	001	18EA	1880	0839* 0864* 0905* 0915* 0941* 0969* 0990* 1027* 1057* 1069* 1100* 1114* 1132* 1161* 1190* 1200* 1210* 1232* 1242* 1295 1300
Q2	A	001	1901	1908	
R	A	001	18EB	1881	0840* 0865* 0906* 0916* 0942* 0970* 0991* 1028* 1058* 1070* 1101* 1115* 1133* 1162* 1191* 1201* 1211* 1233* 1243* 1269
RDCKD	A	004	1191	0967	0141 0179 0182 0233 0240 0319 0326 0372 0643
RDDCF	A	001	18D5	1858	0194* 0252* 0338* 0922 0949 0979 1001 1003 1040 1042 1119 1144 1173
RDDCFN	A	010	18DE	1859	0893 1090 1367*
RDDCR	A	002	18C8	1852	1286* 1341* 1369
RDDDR	A	002	18CA	1853	0890 0931 0959 1015 1045 1087 1122 1147 1178 1219 1287* 1289 1292 1342*
RDHAE	A	004	110F	0903	0075 0081 0110 0139 0177 0231 0285 0315 0419 0500 0577 0639 0683 0696
RDHAO	A	004	111C	0913	0147 0288
RDHAOA	A	005	1126	0918	0908
RDHAOX	A	004	1151	0934	0903* 0913*
RDKD	A	004	11BB	0988	
RDKDA	A	004	11C5	0993	1193
RDKDB	A	003	11F1	1009	1012
RDKDX	A	004	1214	1020	0988* 0993 1018* 1188*
RDLOG	A	004	1260	1055	0048 0053
RDONLY	C	001	0040	1970	1666 1669
RDROO	A	004	1155	0939	0148
RDROOA	A	005	1169	0949	0983
RDROOX	A	004	118D	0962	0939* 0967* 0974 0981*
RDSNS	A	004	1272	1067	0047 0052 0074 0104 0133 0171 0222 0276 0306 0366 0413 0494 0571 0630 0677
RDSNSA	A	004	1296	1083	1062 1080

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RDSNSB	A	003	128D	1079	1076
RDSNSX	A	004	1285	1093	1055* 1067*
RDVKD	A	004	1218	1025	0387 0654
RDVKDX	A	004	125C	1050	1025* 1032 1048*
RECAL	A	004	1072	0837	0045 0073 0103 0132 0170 0221 0275 0305 0365 0412 0493 0570 0629 0676
RR	A	001	18F5	1888	0944* 0952* 0975* 0994* 0999* 1006* 1033* 1038* 1042 1136* 1141* 1165* 1170* 1176* 1214*
RR2	A	001	190C	1916	
RTN	A	001	0A03	0018	
RTNPFC	A	001	0A0D	0033	0020
ROA	A	006	0CC9	0405	
ROAA	A	004	0CDB	0412	
ROAB	A	004	0CEA	0419	0409
ROAB1	A	004	0D38	0459	0456
ROAB2	A	004	0D4E	0469	0466
ROAC	A	006	0D5A	0474	0410
ROB	A	004	0D6C	0487	
ROBA	A	004	0D78	0493	
ROBB	A	004	0D87	0500	0490 0549
ROBB1	A	004	0DB4	0513	0509
ROBB2	A	004	0DC2	0520	0517
ROBB3	A	006	0DDF	0531	0524
ROBB4	A	004	0DE9	0534	0529
ROBB5	A	004	0DF7	0541	0538
ROBC	A	006	0E19	0553	0491
ROC	A	006	0E23	0563	
ROCA	A	004	0E35	0570	
ROCB	A	004	0E44	0577	0567
ROCB1	A	004	0E6A	0591	0588
ROCB2	A	004	0E8A	0604	0601
ROCC	A	006	0EA0	0612	0568
ROD	A	004	0EB2	0625	
RODA	A	004	0EBA	0629	
RODB	A	003	0EC9	0636	0626
ROE	A	006	0EF3	0667	0627
ROEA	A	004	0F09	0676	
ROEA1	A	002	0F17	0681	0667* 0686 0700*
ROEB	A	004	0F1C	0685	0673
ROEB1	A	005	0F26	0687	0690
ROEB2	A	002	0F3F	0694	0685* 0687* 0688* 0689 0700
ROEC	A	006	0F48	0700	0674
RO1	A	004	0A15	0039	0708
RO1A	A	004	0A25	0047	0042
RO1B	A	006	0A3D	0057	0043
RO2	A	004	0A47	0067	
RO2A	A	004	0A53	0073	0070
RO2A1	A	001	0A63	0078	0067* 0085* 0087
RO2B	A	006	0A6E	0085	0071
RO3	A	004	0A7C	0097	
RO3A	A	004	0A88	0103	0100
RO3A1	A	001	0A94	0107	0097* 0114* 0116
RO3B	A	006	0A9F	0114	0101
RO4	A	004	0AAD	0126	
RO4A	A	004	0AB9	0132	
RO4B	A	004	0AC1	0135	0129
RO4B1	A	001	0AC5	0136	0126* 0152* 0154
RO4C	A	006	0AE5	0152	0130
RO5	A	004	0AF3	0164	
RO5A	A	004	0AFF	0170	
RO5B	A	004	0B07	0173	0167
RO5B1	A	001	0B0B	0174	0164* 0203* 0205
RO5B2	A	004	0B0E	0177	0199
RO5B3	A	005	0B29	0190	0195
RO5C	A	006	0B4F	0203	0168
RO6	A	004	0B5D	0215	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
R06A	A	004	0B69	0221	
R06B	A	003	0B78	0228	0218 0257
R06B1	A	004	0B83	0233	
R06B2	A	005	0BA0	0248	0253
R06C	A	006	0BC6	0261	0219
R07	A	004	0BD0	0271	
R07A	A	003	0BE0	0278	0272
R08	A	004	0BFE	0299	0273
R08A	A	004	0C0A	0305	
R08B	A	003	0C12	0308	0302
R08B1	A	001	0C1D	0312	0299* 0347* 0349
R08B2	A	004	0C28	0319	0343
R08B3	A	005	0C45	0334	0339
R08C	A	006	0C6B	0347	0303
R09	A	004	0C79	0359	
R09A	A	004	0C85	0365	
R09B	A	004	0C8D	0368	0362
R09B1	A	001	0C91	0369	0359* 0393* 0395
R09C	A	006	0CBB	0393	0363
R2	A	001	1902	1909	
SCANE	A	004	138A	1198	0425 0513
SCANH	A	004	1398	1208	0431 0452 0584
SCANHA	A	004	13A2	1213	1203 1235 1245
SCANHX	A	004	13C2	1224	1198* 1208* 1213 1222* 1230* 1240*
SCNRE	A	004	13C6	1230	0437 0534
SCNRH	A	004	13D4	1240	0444 0462 0597
SEEK	A	004	1084	0849	0077 0106 0135 0173 0224 0281 0311 0368 0415 0496 0573 0632 0679 0692
SEEKA	A	004	10EF	0888	0844
SEEKX	A	004	110B	0898	0837* 0876*
SETHLT	A	004	1763	1692	1670 1683
SIO	A	003	1474	1308	1269* 1270*
SIOSNS	A	003	1698	1604	1593* 1594*
SKEND	C	001	0002	1963	1304 1318 1323 1432 1724 1727
SKMSK	A	001	18E7	1876	1722
SKMSK2	A	001	18FE	1904	
SKRST	A	001	18E9	1878	
SKRST2	A	001	1900	1906	
SKO1	A	003	10A6	0864	0857
SKO2	A	005	10B1	0869	0871
SKO3	A	006	1001	0879	0883
SKO4	A	003	10E7	0885	0880
SNS	A	002	18E0	1861	0459 0469 0520 0541 0591 0604 1265* 1400* 1402 1460 1578 1581* 1583 1590 1630 1631 1634 1635 1710* 1712 1718 1723 1733 1734
SNSAVL	C	001	0001	1964	1482 1615 1654
SNS23	A	002	18AE	1828	1478
SVPREQ	A	002	18AA	1824	0731 0738
SW	C	001	0001	1978	
SYSRST	A	002	18A8	1822	0730
TEST	C	001	0212	1993	1263
TIMER	A	002	18B5	1840	1329* 1331 1337* 1344* 1346 1352* 1430* 1434* 1606* 1611*
TIO	A	004	1431	1281	
TIOBSY	A	004	1489	1316	1273* 1274* 1311 1313 1326
TIOERR	C	001	0008	1961	1624 1738
TIORDY	A	004	1470	1306	1272* 1296 1301 1586
UCKMSK	A	001	18E8	1877	1589 1732
UCKMS2	A	001	18FF	1905	
UDTO	A	003	0A0C	0023	
UNPACK	C	001	021E	1995	1685
WCPTN	A	004	189C	1809	0190 0248 0334 0405 0504 0505 0544 0563 0607
WORK	A	001	18E1	1863	0852* 0854* 0859* 0869* 0870* 0873 0873* 0879 0882* 0886
WORKN	A	004	18E4	1864	0703* 0705 0719* 0720 0849* 0850 0929* 0931 0957* 0959 1014* 1015 1085* 1087 1460* 1477 1600* 1601 1617* 1618
WRCKD	A	004	12F9	1130	0236 0322 0375 0646
WRCKDA	A	004	1303	1135	1154
WRCKDX	A	004	1333	1152	1130* 1135 1150*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
WRHAD	A	004	12B9	1098	0287
WRHADA	A	005	12C3	1103	
WRKD	A	004	137C	1188	0381
WRREP	A	004	133B	1159	0650
WRREPX	A	004	1378	1183	1159* 1164 1181*
WRROD	A	004	12D4	1112	0317 0641
WRRODA	A	004	12DE	1117	1107
WRRODX	A	004	12F5	1125	1098* 1112*
XEQ	A	004	13E2	1254	0888 0920 0947 0977 0997 1036 1060 1072 1117 1139 1168 1217
XEQX	A	004	152A	1374	1254*
XEQ00	A	003	1409	1267	1259
XEQ01	A	004	1497	1323	1316
XEQ02	A	006	14A8	1329	1321 1324
XEQ02A	A	004	14AE	1331	1339
XEQ03	A	006	14BF	1337	1332
XEQ03A	A	004	14DB	1346	1356
XEQ04	A	006	14EC	1352	1347
XEQ04A	A	004	14FE	1358	1354
XEQ05	A	006	1502	1360	
XR1	C	001	0001	1944	0188* 0190 0193 0193* 0246* 0248 0251 0251* 0332* 0334 0337 0337* 0669* 0670 0685* 0687 0702* 0703 0720* 0722 0723 0725 0725* 0726 0733* 0734* 0758* 0761 0762 0762* 0767 0768 0768* 0772 0774* 0775 0776 0790* 0792 0795 0797 0797* 0798 0802* 0803 0804 0850* 0852 0861 0869 0875 0875* 0876 0878* 0881 0881* 0885 0925* 0926 0928 0928* 0929 0954* 0955* 0956* 0957 0974* 0975 0993* 0994 0995 1008* 1009* 1010* 1014 1032* 1033 1034 1074* 1075 1079 1083* 1084 1084* 1085 1135* 1136 1137 1164* 1165 1166 1213* 1214 1215 1278* 1279 1366* 1367 1647 1649* 1651 1652 1652 1657 1664 1677 1690
XR2	C	001	0002	1945	0026 0185 0228 0243 0278 0308 0329 0636 0760* 0761 0764 0766* 0767 0770 0776* 0778 0795* 0804* 0822 0823 0839 0840 0842 0856 0864 0865 0867 0885 0886 0896 0896 0905 0906 0915 0916 0918 0922 0926 0941 0942 0944 0945 0949 0952 0955 0956 0969 0970 0972 0975 0979 0990 0991 0994 0995 0999 0999 1003 1006 1009 1010 1011 1027 1028 1030 1033 1034 1038 1038 1042 1057 1058 1069 1070 1077 1081 1100 1101 1103 1104 1104 1105 1114 1115 1119 1132 1133 1136 1137 1141 1141 1142 1144 1161 1162 1165 1166 1170 1170 1171 1173 1176 1190 1191 1200 1201 1210 1211 1214 1215 1232 1233 1242 1243 1269 1270 1272 1273 1276 1279 1295 1300 1589 1593 1649 1696 1708 1715* 1716 1716* 1722 1732 1744*

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

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

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
°GBK°GBD°°°PN°42	47620°EC°571931°	3340°SYSTEM°TEST	°MODULE-MODEL°12	84@@84@@°°°C1110	0°°°°°°°C1F30000
T.-Y>O¬(°°&°°B-4	P8<E&°°D°""@#-AS	?|°YQ%%BGC6YH̄I&Y	°OH*&*%BGDX.°/1I	-+-D°°°°%H̄B&-G/0	QE°UG4Q<C1F30001
T.&Z*F<$°/1I2OH*	KQ<BGDA<|°AS2FG#	°°JAQ|°°H̄Q@BGC6Y	H̄MOZ>OH*&*%BGDX.	°/0°,I2</G1%PD1D	(B&MA&9°C1F30002
TA&ZSD&"°/1BD°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°MA@H̄MC1F30003
T.&D̄J°°C°/1D|OH*	&DO8°BW<Q¬T4<BW|	°-/AQ|°°H̄V<BGC6Y	H̄S°D̄¬OH*&*%BGDX.	°/0°°H̄2*THJ@$E1<	|C&UE2Q<C1F30004
T°&D̄LDH&°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°A$°<C1F30005
T.&,B°N7°/1D|OH*	&DO8°BZ&Q¬T4<BZL	°-/AQ|°°H̄1*BGC6Y	H̄O&,VOH*&*%BGDX.	°/0°°H̄2*THJ@$E1<	|C&UE*L<C1F30006
T°&,DDH&°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°A;#YC1F30007
T.-,4°°C°/1D|OH*	JU&°:°JTD+-DQ1%B	GDJ3°/1ENOH*&DO8	B%MQ¬T4<B%P°-/A	Q|°°°°BOYIBH;F/Q	KC-UEKZ<C1F30008
TE&%H̄BO?°/O·D̄BO*	.L@BGDG.°/1I2OH*	&/°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	ND&4 |AOMALJ<C1F30009
T<°%@°N7°/1D|OH*	JU&C°/1FJ°Q4BD1S	&O°DOGTMAF<R(°O<	QX<°AES$K°&&|°JT	)FH.°°&°>.BM/GA-	MC-UE)H̄HC1F30010
T.&_D̄2U8°JTF+-D	Q1%B&BO#°/1°LC-°	.B1/=|&O.B@BBDE-	@B/S2OH*|Ē-_8B@$	°/0°,H̄K*TG1%PEJD	(B&MA9J<C1F30011
T<°>$DG.°/1I2OH*	&/°°AP$-H°<°&DA|	°/1D|OH*JU&G°/1.	9°-C°/1FJ°Y4BD1S	&O°DOG-°O.BQ-F1*	LB&MALH̄8C1F30012
T.&?I(&DQ1U4C°1S	*O°DOI_HAA°@AF!4	Q-%°AB:°8°JTF+-D	Q1%B&B7T°/1°LCO°	Q%-°°°B4ZIKD)FJM	LC°-CN̄D8C1F30013
T.&77FG#°°JAQOH*	|Ē-?-B"#°/1A2OH*	K*,-H°<°&DA|	/1B	D°°E)OH*JC@BGD,X	°/0°°°B%XHAOND&4	.B&MA=38C1F30014
TI°O*DJ3°/1°L|°°	<G*BGC6Y<D-1,OH*	&*%BGDXH̄8B°C°DA°	LOH*&/°°°°°°°°°°	°°°°°°°°UHAUND&@	(B&MA'°YC1F30015
T<°1+°N7°/1D|OH*	K5<BGDRDAOH*K=&H	MOH*JUJO(°/<QU<°	AE/85°JTFL&<CFI3	°°JQW4-°?H̄2QSG/-	KC&UE@1QC1F30016
T.-1'°&&|°JT)FH.°	°°&1E+°DQ1TYAF<$	°U°0YOH*&DO8°CA4	Q¬T4.CA7°AAAQ|°°	<U*°°.KUVHJ@$E1<	|8O*EL$MC1F30017
TD-2&/O'D̄CH4<>@B	GDG.°/1I2OH*&/°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°D-8	H̄A-&BP.OC1F30018
T.03A°N7°/1FJ°*B	GD?UBI-8AF<QQU<B	GD7OBI-@AF<QQU<B	GD/-AI@BGDA<+°°2	JFG8°B8%H̄BH;GAQ	KD°YE;1<C1F30019
T.&37B02JO°&&D°O	CF̄H°QXC3=FI#°/O°	D̄C+Y(O%BGDG.°/1I	2OH*&/°°AP*BGD&@	@"O°°H2&-GA-OEA°	<B-QB)1YC1F30020

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T.&4)F/4<"/Y*F/4	<°/U-FI"°/1+H̄°&C	AO1QGOH*LW°D°O*<	OA@BGD@QA°<GCE-¬	°/0°°°B%VHJ%PD&4	.AOMA008C1F30021
T.05(D'&A°<GCE-*	@)1U¬OH*LW°D°O*<	(+<BGE-°8&AT-OI°	N=*BGD'&A°<GCCM#	°/1Q°°B@,IK□IFJM	|BO*A;H̄QC1F30022
T.&5#+D°Q8<B&E-C	°/1°LC-°QX/S;+-D	QXT7"FI#°°JAQ|°Y	Q%%BGC6Y(/O8ROH*	&@-°_H̄K*VHJ4REJD	|BO*CKCHC1F30023
T.°6YOH*K*%BGDH&	°°N7°/1D|||&H̄G-3	"F/4ĒG-OCFK&QX°O	AFKDQX°OAFJ@Q¬C-	A°°°°H̄S-UH/&*F&Q	KC-*CLH*C1F30024
T.07QF<$2U°Q<AJU	VFKL°/1+H̄°&CA007	BOH*O°C/°F+C°UAP	9+°DQ1?H&C-4CFK-	QW<°A°B4,IB°*FA&	+B--A@$*C1F30025
T.&8FES$°/07ZC&<	RH̄JSQO°DO1%9GD@Q	A°<GCC¬¬°/1Q°+D°	Q8<B&E¬U(°1UYFI3	°°&°°H̄2UVHJ4RDO@	.B&MAL:DC1F30026
TH̄O82ESQ8°JTF+-D	Q1%B&CQ¬°/1°LCO°	Q%//=O°D&O°OCFH̄°	QXC3=FI"°/O'D̄CU&	°°°°,H̄K"/G1%PEJD	(B&MA8A*C1F30027
T.-9/C̄D̄C°/1A2OH*	K*%8GDH&°°N7°/1D	|||@ĒG&3=F/OĒG&O	CFKDQYC3"FK.°/1+	Q°&°°.B-UH/&*FA&	(B&MA#HYC1F30028
T.&:|O*<+Ē%BGE-°	B&AT-OA°D.-4CFK*	QW<°AES$°/1|H°&C	AUO:H̄OH*O°C/°F+C	°D°°°°B%XH1%REJ<	|BO*C5:UC1F30029
TH̄O:#ES8(°1UXFI3	°°JQWOH*&DO8°FI@	QX3YAFI@'"1S¬O°D	&O<BGC6Y+2&#3OH*	°°°°ZI2M/GJUND0@	.AOMA1.UC1F30030
T<°#%DG.°/1I2OH*	&/°°AP$-H°<°&DA|	°/1D|OH*K5<BGDRD	AOH*K=&HLOH*L+OH	LOH*KF°°OH̄S&¬F1*	LB&MAĒA°C1F30031
TH̄°@N°/|°/1°LC°D	|E1/@O-DH̄°L&AF..	°/0'D̄C10|K<BGDG.	°/1I2OH*&/°°°°°°	°°°°°°B*TG1%RE1<	|BOUEKR@C1F30032
TI&@'OH*JC3MAF.H	<°&@"C1*;°&@"C?	=C38(°&@"FI.°/°@	WOH*&/°°°°°°°°°°	°°°°°°°°UHACĒE/D	(BO*C@°OC1F30033
T.&'_OH*JC@BGDA<	<°&@PC3"B°&%A(°D	Q9°8AF.HQ¬-4AF.H	Q9<°ADET°/OYN(°-	Q9°°_H̄K"/G1%REJD	(BO*C1.<C1F30034
T<&=¬(&DQ9AOADGD	AG°D&NO|K°&&4°J°	K@@J=<*MQD̄CGEFH̄,	B°¬5V(-DQ¬%°AC9H	11JS%<*"°.2%XG1%	MC°*CL°<C1F30035
T.&"(FH̄Y(°&YAB-G	°°&YHC°DQ1ASUC°D	Q1/SW+H°Q,@°&C'O	<BJ¬"FE&<BJ-?FE&	@°°°°H2UVH1@$E1M	JCOMA)28C1F30036
T<&""FAU<E/-QFAU	<E1/IFAU@-AS?O-D	Q>%HBF+N4°-GK°&H̄	@°°CB°/T@)°HA4-D	B?°°°¬|@°I/UND&4	.AOMAJ1YC1F30037
T(J°5°<HAF.Y4°JS	9)&HA>U°°OH*°°||	D¬-4AB-DH̄°*°AB-Y	5°JS9¬¬@B@YD+)&H	C4-DB(°DQ>*EG°C<	TF&-D=8@C1F30038
T<JAXDETB°JS:(°D	Q>PMB°L/°FH̄"2U°Y	#&AS?OH*BH%D°OH*	°°°OAF<&QZ°OAF<Q	QZ,/°°.Y°.K%XIJ*	&B&MA9#@C1F30039
T<1B$&°C°UA°|OH*	°°C&HD&:@°°O@°&Ē	<BJ&Q¬|HGE3&HF+&	5°JTUG°HQ9°H@B1T	/>H°°@Z°.|°°%I2<	¬F°4ER3-C1F30040
T<AC<°JT/¬&D°OH&	&D#O°A$O°AYOIEA/	@G-DQ9°H|°AT/FG#	°°JB1C-DQ9ATS4-D	C(°DJC-°OH̄K*TG14	QE°UB=°UC1F30041
T<AC'O-D°°°4AF+&	QT|H̄BC)HA°&@AF+&	QI<BGD(F4°&6<°&@	Q9<BGD=H(°JTFF<,	°°JQ+C&°?H2UVHJU	NDOUG",-C1F30042

OBJECT CARD LISTING

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

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T</DOBJTMF(#  JQ  ;,  <HC@BG  4BAE  M?  DE?  DF@Y*H(  -  JN.OAA$OIAYOIEA/  @OH*L8S4C  O.BD  MB  &BLZ4C1F30043
T</ETF(UHO  DOGTM  AF<E*BA<H4-DI(  D  Q9  4AF+&Q2%  AE-#  /O  (  -JU.OAA$O  HA,O  D.O  B*¬F1U  NB-QAQ$BC1F30044
T<JFNE<BGD=H(BA<  Q7*  AE/:@  A  5  JT  F_-DJ_-DL(  DQ9  4  AF+&Q2%  AE-#  /O  (  -JU.O  <B-UH/8  MC&UD2JOC1F30045
T<AGF  &D@  -E<  1&  Q¬CMADRB*  A  OH*  L8YOBD1T)C-DJUA/  =OH*JEL&HD/;@  &O  @  Q5  &  B-UHA8  EE&4I:8OC1F30046
T</G9D/;*  A  X  M  *BGD=H>  A  M(¬@  Q7%  AE/:(BA<Q7*  AE/:@  A  5  JTF_-D  J_-DLT-  M  ZH/8  RE&4AJ-<C1F30047
T./HYFIL  /G1(  D  Q9  4AF+&Q2%  AE-8  +  JHPFHC  /O  (  -  KP#OAA$OCAYOBD1/  @(&D  %HJUPDO@  (B&MA&Q8C1F30048
T<AIRDV=*  A  X  M  *BGD=H>  A  M(¬@  Q7%  AE/:(AJ  G6%  AE/8(  JTFF<,  JQ  +C-DKPO  O.B-WH/8  RE&4A¬QHC1F30049
T<1H(FHC  /O  (  -  K>.OAA$OEA%BGD=.  /1HO(  -K>.OAA$O  GA%BGD=H5  JTF;&H  B@Z  C>Y  ;  ZIJ%  PDOUA$T&C1F30050
T<JH"  -G2U  +:B  5  JTF4-DQ(  DQ9  4  AF+&Q2%  AE-8(BJT  MF(#  JQ;OH*  C&  HD?S@  -M  .SQSHAO  QE/H.  -C1F30051
T</.2?  QFT  -MFG2  %  O@HT  HLFH,2/OY  4BA.8?  HE?  QFOH*  L8Y4HD1T)O  DOG-4  AF<QQ2%  A  C  >HSQ  /E1  GRRQC1F30052
T<1<WE-#  /O  (  -  L(,OBA$OBATMAD3E  *  A  X  M  *BGD=H  >  A  M?(@MT&-LF(7  JQ;C&DQ1-  3.2%  ¬DOUA7I*C1F30053
T</(RF<,  JQ+C-D  L(/S  OH*  <BGDO<  4BA(#?  HE?  <F(&D  L;9O  D  B*  A&AOH*  L@D8  DAK@  B4/E1<  .B&MA¬I*C1F30054
T<J+.*1K(BA<Q7*  AE/:@  A  (  JTFF<,  JQ+C-DL;1S  OH*  C&HD/;@  -O@  $  /1GE(  -  .2M)F1*  LD&YF=OYC1F30055
T<J+'D@O@  OO@  $  /1+S(  -L1$OCA$O  BATMAD@O*  A  X  M  *BGD=H(  JTFF<,  JQ+C-D  B@,HKM  RCO%A2/UC1F30056
T<J(?D@MQ-<BG  4BA(E?  <E?  OFOH*  LYT&HD@D@  OO@C&$  /1+S(  -N.L2  EHQ  @-AKKC&D  .2%XH1U  NBO<A31%C1F30057
T<J&/B-DH  ¬HADTO  &EIH@/1KFOH*BD-O  AF+  Q¬(|D-BOAEGQ  F.-  M)&D%  AJ1  KO  EHYA+-D  .SUUG1-  OC-YA8EQC1F30058
T.1JJEHY%BJTMECM  AF<J%B&UMO*HN.TG  FF<&11ATF<<QQ2CC  DF<Y(  JTFF<,2  ;*  (  JTF  B@YISH;F/Q  KB-MAEQHC1F30059
T<AKBF<,  JM@>  &  E@/  K+-&Q,#4  A¬H  ABC%DFH@:  /S?O&  NM?<  4AB-DH  *  AEHXAO-  B8YHJ4  RCOMA*-HC1F30060
T.1K2EHX  ANEO&  MV3-BFH"2  <72/1D  8  /S?@/  HC  MZJK  HO&  NE  OAF.MQ¬C4  F.P2  B8DH8&-G/*  (B&MAO  -C1F30061
T<ALT  &Y(  &YAB-G  &YHC-DQ_JS  OH  N/%GBEH8O1/TH<<&  Q2-OAF.MQ¬C4  F.P  2  &Y(  &  ,12M/GJU  ND&@E11%C1F30062
T<AMM8-DH  *  AB-Y  +  JS5FHC  YAPRO*&  M"%BGE(?  /1)8C&D  H  &YAO  DHBT--FH"  DARE(&  ?H2D)FJM  JC&%A@-MC1F30063
T<JNF  JTDG  UQ7-U  (  JTDF<T  JQO@@J  =OH*  COAF.|2/5M  @  /S3@Y*D|  <Q%"|  D  TCEF+  <KYTGAD  (BOQ&2@MC1F30064
```


OBJECT CARD LISTING

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

```
T<AN7+  DQ8|H&L%B  GE?4@AJS3OH*OJLO  FF.|2/O%@A1S3@Y*  D|  -Q%OOAF.MQ¬CU  FFH"2D  >HS-UGJO  KC-YC5A&C1F30065
T<AOYB-8AF.MQ¬%  -EP.2/O&@BJS3@@J  =+2  Q,"HG%LOHF.|  /1$'|  OQ%OOAF+&  Q8|HGC  _H2*TG1-  JB-QD"$&C1F30066
T.JPO|  8Q%@BGE?4  @C1S3|  R(&OOFL&  R(&OAFJ@Q9CGGFH8  O11U/|C  RILYAFH"  /O  H2*TG1%REJ<  |BO*CM.YC1F30067
T<JQHE?7A1AP2+  &  O,"H&A3O&F.|./5Y  @DJS3@Y)L|AHQ%"H  GLCOLF.|2/4M@EAS  3@Y*=|AM  BOVG/*  &B&MA;9OC1F30068
T.1Q8F.|2/3*@E/S  3OH*O"LOPF.|  /1$  '|A-Q%@BGE?4@FJS  3OH*O"LOEF.|2/1  @GAS3  B@YIB  *FA&  &C  -A)SDC1F30069
T./RXOH*O"LO;F.|  /1$'@@J=+B  Q,"H  &C&4AF+  Q¬|HAACC  EF+  8  JT-OA  NX  O  EW%  >HSQSF1U  KBO*C&BDC1F30070
T.1EPEGGA  AR:.  O)  <9  AT¬@/A|.  OWED:  JERO*HO2LG  DFHHO1ATUC&DQ9AS  S@-D1  BODISH;F/M  +B&MA;$8C1F30071
T./$F@O  GC  DQ_J/  @C&DH  &YAO  DHB-8  AF.MQ¬%B-E%XAO/E  ,+-DQ,3CEF+&8  JT  UOA  %HB&-CA-  OC  -F33-C1F30072
T./$5E$D8HAS?OI  O"L-HFH"  DAQ5+A  Q,@  &ER&9EAT-+&@  Q7@  &EEU9DAT-+&@  Q7@  .KUVHJ4REJD  (B&MA5S&C1F30073
T<J*XUAQ'OH*|-*M  AEXO  .5CO.S@8  JS  ?@ZAGLA*?FLM'-AU  :@-DE|&HRG"HAD4O  IEJ/Y+D  ?12  *E  QBK$*C1F30074
T<J)RF.C2DD  :&AS  O@Y*?|M  RG?HAFT4  NFKP2  J(<BJHQPTS  F.C2DA@:-AS0@Y*  +OH*BG-D  ZH/8  OCO-AKS%C1F30075
T./;HF.<Q*UOIEJ/  2+U  Q,OO  DE<Q%3%  "FH=#0  C  /1  L(  -  P73&BF.*01JT-+  D  Q8|H  .KUVHJ4OD/  <B  <A¬  MC1F30076
T<A;9DDU5  /S9_&H  A+A  Q8C-DFH"2DA*  %  A;T  T-  F(@8  /S  ?@Z  X+OHQ,"HGAC%  DFH@%  B8XHAO  PD  OE6RUC1F30077
T</¬%E#8C+&  Q73U  HF+C2U  TA1A¬Q+--  Q,3Y&FH@:HAS?(&H  Q_@BG  B  B||3'|A  4'$G-ALD  BD)FJM  JB-QAJ:DC1F30078
TBA¬56*XV1MC1&FA  .....  .....  .....  .....  32&C1F30079
T  J-A&A-  .....  .....  .....  .....  .....  ¬1HC1F300&0
TB1-V-ALD6*XV1MC  2&FA  .....  .....  .....  .....  .....  9D  C1F30081
T  J-1&A-  .....  .....  .....  .....  .....  L1  C1F30082
T+/SD"'PO&<PR6|$  R8UCN5>(  6*PA1+/  6*PA1DCO5)|Y&<P  R6MCH4=(  9=*  .....  D  -  D  EZ8C1F30083
TE1S*  M  H  A&  D  N7"""""""  7|"=D  .....  1#*C1F30084
TC1SOFJ8REAU;H  U  @-I  H  .....  A&<APC  C1F30085
TAATZ  <  H-D  .....  .....  .....  .....  .....  1-QC1F30086
```

C1F3 3340 SYSTEM TEST MODULE -- MOD 12

OBJECT CARD LISTING

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

TA/U E=Y 2 J H                                                                                  A*HQC1F30087

T JUKFAY                                                                                        A#Q C1F30088

E"""*E7*=¬DC"PH$  ="7M&F|   |   C     F%   ASC   R A  SO   Q                  14200630750  806760,<C1F30089
```

-- LAST PAGE --

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                            2 *                                                    LAST CHG: 07/16/76
                            3          DECK  4
                            4          SEQ   0
                            5        TREP
                            6 *
   0000                     7 C1C      START 0
                            8 ********************************************************************************
                            9 *                                                                              *
                           10 *                              SECTION PREFACE                                 *
                           11 *                                                                              *
                           12 ********************************************************************************
                           13 *
   0A00                    14          ORG   X'0A00'
                           15 *
   0A00 C1C0       0A01    16 PID      DC    XL2'C1C0'          SECTION ID AND REVISION LEVEL
   0A02 00         0A02    17          DC    XL1'00'            SECTION FLAGS
   0A03 01         0A03    18 RTN      DC    XL1'01'            CURRENT ROUTINE NUMBER
   0A04 0000       0A05    19          DC    XL2'0000'          RESERVED
   0A06 0A3A       0A07    20 PFC      DC    AL2(RTN01)         ADDRESS OF FIRST ROUTINE PREFACE
   0A08 FFFF       0A09    21          DC    XL2'FFFF'          RESERVED
                           22 *
   0A0A C15000     0A0C    23 UDT0     DC    XL3'C15000'        UDT
                           24 *
   0A0D            0A18    25          DS    XL12               RESERVED
                           26 *
   0A19 00         0A19    27 COM      DC    XL1'00'            PROGRAM COMMUNICATION AREA
   0A1A            0A1A    28          DS    XL1                RESERVED
                           29 *
   0A1B            0A1C    30 LDRID    DS    AL2                MICROCODE LDR (C17) IN STG INDICATOR
   0A1D            0A1E    31 AMOPID   DS    AL2                AMOP (C19) IN STG INDICATOR
   0A1F            0A20    32 FAOID    DS    AL2                ATTACHMENT MICRO-CODE (FA0) IN STG
                           33 *
   0A21            0A39    34 SVPFC    DS    XL25               SECTION PREFACE STORAGE AREA
                           35 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                           37 ********************************************************************************
                           38 *                                                                              *
                           39 *                    ROUTINE 01   DISK INITIALIZER                             *
                           40 *                                                                              *
                           41 ********************************************************************************
                           42 *
   0A3A 01                 0A3A 43 RTN01    DC    XL1'01'            ROUTINE NUMBER
   0A3B 00                 0A3B 44          DC    XL1'00'            ROUTINE FLAGS
   0A3C 0A7A               0A3D 45          DC    AL2(RTN02)         ADDRESS OF NEXT ROUTINE
                                46 *
   0A3E 0C 0D 1127 134D         47 R01      MVC   MSG05A(14),MINT    INITIALIZE
   0A44 0C 0D 1157 134D         48          MVC   MSG06A(14),MINT      PRINT
   0A4A 0C 0D 11F4 134D         49          MVC   MSG17A(14),MINT        MESSAGES
                                50 *
   0A50 C0 87 0B32              51 R01A     B     BEGIN              PERFORM INITIALIZATION
   0A54 0A5E               0A55 52          DC    AL2(R01B)            'NXTRC' RETURN ADDRESS
                                53 *
   0A56 3A 08 13E8              54          SBN   IND,STRT           TURN ON START MESSAGE IND
                                55 *
   0A5A C0 87 0CFD              56          B     RECAL              RECALIBRATE
                                57 *
   0A5E C0 87 0D1F              58 R01B     B     SEEK               SEEK
                                59 *
   0A62 C0 87 0D53              60          B     RDHAE              READ HOME ADDR & RO COUNT EVEN
   0A66 C0 87 0DBC              61          B     WRHAE              WRITE HOME ADDR & RO COUNT EVEN
                                62 *
   0A6A C0 87 0D75              63          B     RDHAO              READ HOME ADDR & RO COUNT ODD
   0A6E C0 87 0DF0              64          B     WRHAO              WRITE HOME ADDR & RO COUNT ODD
                                65 *
   0A72 C0 87 0E24              66          B     WRCCD              WRITE COUNT COMPRESSED DATA
                                67 *
   0A76 C0 87 0C81              68          B     NXTRC              ADVANCE TRACK ADDRESS
                                69 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              71 ********************************************************************************
                              72 *                                                                              *
                              73 *              ROUTINE 02    HOME ADDRESS FLAG BYTE RESTORE                    *
                              74 *                                                                              *
                              75 ********************************************************************************
                              76 *
  0A7A 02                0A7A 77 RTN02    DC    XL1'02'                 ROUTINE NUMBER
  0A7B C0                0A7B 78          DC    XL1'00'                 ROUTINE FLAGS
  0A7C FFFF              0A7D 79          DC    XL2'FFFF'               LAST ROUTINE
                              80 *
  0A7E 0C 0D 1127 135B        81 R02       MVC   MSG05A(14),MREST        INITIALIZE
  0A84 0C 0D 1157 135B        82           MVC   MSG06A(14),MREST          PRINT
  0A8A 0C 0D 11F4 135B        83           MVC   MSG17A(14),MREST            MESSAGES
                              84 *
  0A90 C0 87 0B32             85 R02A      B     BEGIN                   PERFORM INITIALIZATION
  0A94 0A9E              0A95 86           DC    AL2(R02B)                 'NXTRC' RETURN ADDRESS
                              87 *
  0A96 3A 08 13E8             88           SBN   IND,STRT                TURN ON START MESSAGE IND
                              89 *
  0A9A C0 87 0CFD             90           B     RECAL                   RECALIBRATE
                              91 *
  0A9E C0 87 0D1F             92 R02B      B     SEEK                    SEEK
                              93 *
  0AA2 C0 87 0D53             94           B     RDHAE                   READ HOME ADDR & RO COUNT EVEN
                              95 *
  0AA6 38 02 1418             96           TBN   FF,BIT6                 SKIP IF TRACK IS
  0AAA F2 90 37               97           JF    R02F                      NOT FLAGGED DEFECTIVE
                              98 *
  0AAD C0 87 0D97             99           B     RDSNS                   READ DIAGNOSTIC SENSE
                             100 *
  0AB1 0C 01 1415 8017       101           MVC   SKDEVN(2),DDDF+23       SAVE EVEN SKIP DISPLACEMENT
                             102 *
  0AB7 0D 01 1415 1365       103           CLC   SKDEVN(2),NULLS         GO WRITE
  0ABD F2 04 1C              104           JNH   R02E                      WRHA IF SKIP
                             105 *                                          DISPLACEMENT NOT
  0AC0 0D 01 1415 137C       106           CLC   SKDEVN(2),P286              BETWEEN 0
  0AC6 F2 02 13              107           JNL   R02E                          AND 286
                             108 *
  0AC9 38 40 020D            109           TBN   SBYTE5,SSW29            BYPASS FORCED WRHA IF
  0ACD F2 90 14              110           JF    R02F                      SSW29 IS NOT ON
                             111 *
  0AD0 C0 87 0D1F            112           B     SEEK                    SEEK
                             113 *
  0AD4 31 C5 1386            114           LIO   CEWR,X'C5'              SET X REG WRHA PREREQ OVERRIDE
  0AD8 31 C5 1382            115           LIO   SVPREQ,X'C5'            SET SVP REQUEST
                             116 *
  0ADC C0 87 0DBC            117 R02E      B     WRHAE                   WRITE HOME ADDR & RO COUNT EVEN
                             118 *
  0AE0 3A 20 13E8            119           SBN   IND,RSTEVN              SET 'RESTORE EVEN' INDICATOR
                             120 *
  0AE4 C0 87 0D75            121 R02F      B     RDHAO                   READ HOME ADDR & RO COUNT ODD
                             122 *
  0AE8 38 02 1418            123           TBN   FF,BIT6                 SKIP IF TRACK IS
  0AEC F2 90 37              124           JF    R02H                      NOT FLAGGED DEFECTIVE
                             125 *
  0AEF C0 87 0D97            126           B     RDSNS                   READ DIAGNOSTIC SENSE
                             127 *
  0AF3 0C 01 1417 8017       128           MVC   SKDODD(2),DDDF+23       SAVE ODD SKIP DISPLACEMENT
                             129 *
  0AF9 0D 01 1417 1365       130           CLC   SKDODD(2),NULLS         GO WRITE
  0AFF F2 04 1C              131           JNH   R02G                      WRHA IF SKIP
                             132 *                                          DISPLACEMENT NOT
  0B02 0D 01 1417 137C       133           CLC   SKDODD(2),P286              BETWEEN 0
  0B08 F2 02 13              134           JNL   R02G                          AND 286
                             135 *
  0B0B 38 40 020D            136           TBN   SBYTE5,SSW29            BYPASS FORCED WRHA IF
  0B0F F2 90 14              137           JF    R02H                      SSW29 IS NOT ON
                             138 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  0B12 C0 87 0D1F            139           B     SEEK                    SEEK
                             140 *
  0B16 31 C5 1386            141           LIO   CEWR,X'C5'              SET X REG WRHA PREREQ OVERRIDE
  0B1A 31 C5 1382            142           LIO   SVPREQ,X'C5'            SET SVP REQUEST
                             143 *
  0B1E C0 87 0DF0            144 R02G      B     WRHAO                   WRITE HOME ADDR & RO COUNT ODD
                             145 *
  0B22 3A 10 13E8            146           SBN   IND,RSTODD              SET 'RESTORE ODD' INDICATOR
                             147 *
  0B26 39 30 13E8            148 R02H      TBF   IND,RSTEVN+RSTODD       PRINT MSG IF EVEN OR
  0B2A C0 90 0F58            149           BF    RSTMSG                    ODD WAS RESTORED
                             150 *
  0B2E C0 87 0C81            151           B     NXTRC                   ADVANCE TRACK ADDRESS
                             152 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               154 ***********************************************************************
                               155 *                                                                     *
                               156 *                INITIALIZATION AND TRACK ADVANCE SUBROUTINE          *
                               157 *                                                                     *
                               158 ***********************************************************************
                               159 *
    0B32 34 08 0C80            160 BEGIN    ST    BGNX+3,ARR             SAVE RETURN ADDRESS
                               161 *
    0B36 35 01 0C80            162          L     BGNX+3,XR1             SET UP 'NXTRC' SUBROUTINE
    0B3A 1C 01 0CDC 01         163          MVC   NXTRCX+3,1(2,XR1)        RETURN ADDRESS
                               164 *
    0B3F D2 01 02              165          LA    2(,XR1),XR1            SET UP 'BEGIN' SUBROUTINE
    0B42 34 01 0C80            166          ST    BGNX+3,XR1               RETURN ADDRESS
                               167 *
    0B46 3D 80 0233            168          CLI   UTAB+1,X'80'           JUMP IF LOADING
    0B4A F2 81 08              169          JE    BGN01                    FROM DISK
                               170 *
    0B4D 38 20 0A19            171          TBN   COM,MPLFLG             LOAD MICROCODE
    0B51 C0 90 104D            172          BF    MPL                      IF REQUIRED
                               173 *
    0B55 39 30 020B            174 BGN01    TBF   SBYTE3,SSW1A+SSW1B     BRANCH IF ANY
    0B59 F2 90 14              175          JF    BGN02                    DRIVE SELECTED
                               176 *
    0B5C C0 87 021A            177          B     PRINT                  PRINT MESSAGE
    0B60 46               0B60 178          DC    XL1'46'                  'SELECT DRIVE'
    0B61 46               0B61 179          DC    AL1(MSG02N-MSG02)
    0B62 10DA             0B63 180          DC    AL2(MSG02N)
    0B64 C1E4             0B65 181          DC    AL2(HLTE4)
                               182 *
    0B66 C0 87 0222            183          B     HALT                   UNCONDITIONAL HALT E4
    0B6A C1E4             0B6B 184          DC    AL2(HLTE4)
                               185 *
    0B6C C0 87 0B55            186          B     BGN01                  GO TO CHECK SENSE SWS AGAIN
                               187 *
    0B70 39 10 020B            188 BGN02    TBF   SBYTE3,SSW1B           JUMP IF DRIVE 1
    0B74 F2 90 0F              189          JF    BGN03                    NOT SELECTED
                               190 *
    0B77 3C F1 13F3            191          MVI   DRV,C'1'               SETUP DRIVE NUMBER
    0B7B 3C C0 13F4            192          MVI   DRVADR,X'C0'           SETUP DRIVE ADDRESS
    0B7F 3C 80 13F5            193          MVI   UCKMSK,X'80'           SETUP UNIT CHECK MASK
                               194 *
    0B83 F2 87 2A              195          J     BGN07                  GO TO CHECK DRIVE READY
                               196 *
    0B86 39 20 020B            197 BGN03    TBF   SBYTE3,SSW1A           JUMP IF DRIVE 2
    0B8A F2 90 0F              198          JF    BGN06                    NOT SELECTED
                               199 *
    0B8D 3C F2 13F3            200          MVI   DRV,C'2'               SETUP DRIVE NUMBER
    0B91 3C C8 13F4            201          MVI   DRVADR,X'C8'           SETUP DRIVE ADDRESS
    0B95 3C 40 13F5            202          MVI   UCKMSK,X'40'           SETUP UNIT CHECK MASK
                               203 *
    0B99 F2 87 14              204          J     BGN07                  GO TO CHECK DRIVE READY
                               205 *
    0B9C C0 87 021A            206 BGN06    B     PRINT                  PRINT MESSAGE
    0BA0 46               0BA0 207          DC    XL1'46'                  INVALID SETTING
    0BA1 2E               0BA1 208          DC    AL1(MSG03N-MSG03)          OF SENSE SWITCHES 1A-1B
    0BA2 1108             0BA3 209          DC    AL2(MSG03N)
    0BA4 C1E2             0BA5 210          DC    AL2(HLTE2)
                               211 *
    0BA6 C0 87 0222            212          B     HALT                   UNCONDITIONAL HALT E2
    0BAA C1E2             0BAB 213          DC    AL2(HLTE2)
                               214 *
    0BAC C0 87 0B55            215          B     BGN01                  GO TO CHECK SENSE SWS AGAIN
                               216 *
                               217 *----------------------------------------------------------------------
                               218 *            CHECK FOR DRIVE READY CONDITION
                               219 *
    0BB0 0C 00 0BC3 13F4       220 BGN07    MVC   BGN08+1(1),DRVADR      BUILD READ DIAG
    0BB6 3A 01 0BC3            221          SBN   BGN08+1,BIT7             SENSE COMMAND
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               222 *
    0BBA 31 C6 137E            223          LIO   DDCR,X'C6'             DDCF ADDRESS TO DDCR
    0BBE 31 C4 1380            224          LIO   DDDR,X'C4'             DDDF ADDRESS TO DDDR
                               225 *
    0BC2 F3 00 07              226 BGN08    SIO   X'07',*-*              READ DIAGNOSTIC SENSE DATA
                               227 *
    0BC5 C1 C2 0BC5            228          TIO   *,X'C2'                LOOP ON ATTACHMENT BUSY
                               229 *
    0BC9 38 40 8000            230          TBN   DDDF,BIT1              BRANCH IF
    0BCD F2 90 1A              231          JF    BGN09                    DRIVE IS READY
                               232 *
    0BD0 0C 00 110F 13F3       233          MVC   MSG04A(1),DRV          DRIVE NUMBER TO PRINT MESSAGE
                               234 *
    0BD6 C0 87 021A            235          B     PRINT                  PRINT MESSAGE
    0BDA C6               0BDA 236          DC    XL1'C6'                  'DRIVE X NOT READY'
    0BDB 11               0BDB 237          DC    AL1(MSG04N-MSG04)
    0BDC 1119             0BDD 238          DC    AL2(MSG04N)
    0BDE C101             0BDF 239          DC    AL2(HLT01)
                               240 *
    0BE0 C0 87 0222            241          B     HALT                   ERROR HALT 01
    0BE4 C101             0BE5 242          DC    AL2(HLT01)
                               243 *
    0BE6 C0 87 0B55            244          B     BGN01                  GO TO RE-CHECK SENSE SWITCHES
                               245 *
    0BEA 0C 01 13EA 137A       246 BGN09    MVC   MAXCYL(2),P209         SETUP MAXIMUM CYLINDER ADDRESS
    0BF0 0C 01 13EC 1372       247          MVC   MAXHD(2),P7            SETUP MAXIMUM HEAD ADDRESS
                               248 *
    0BF6 39 07 8002            249 BGN0A    TBF   DDDF+2,X'07'           SKIP IF NOT
    0BFA F2 90 0C              250          JF    BGN0F                    CE DATA MODULE
                               251 *
    0BFD 0C 01 13EA 1378       252          MVC   MAXCYL(2),P34          SETUP MAXIMUM CYLINDER ADDRESS
    0C03 0C 01 13EC 1374       253          MVC   MAXHD(2),P17           SETUP MAXIMUM HEAD ADDRESS
                               254 *
    0C09 0C 03 13F0 1365       255 BGN0F    MVC   SKADR(4),NULLS         INITIALIZE SEEK ADDRESS
                               256 *
    0C0F 38 80 020D            257          TBN   SBYTE5,SSW28           JUMP IF SENSE SWITCH 28
    0C13 F2 90 3A              258          JF    BGN0D                    IS NOT ON
                               259 *
    0C16 C0 87 021A            260          B     PRINT                  PRINT MESSAGE
    0C1A 45               0C1A 261          DC    XL1'45'                  TO ENTER STARTING
    0C1B 50               0C1B 262          DC    AL1(MSG1BN-MSG1B)          CYLINDER ADDRESS
    0C1C 133F             0C1D 263          DC    AL2(MSG1BN)                  INTO CPU
    0C1E C1E1             0C1F 264          DC    AL2(HLTE1)                     SWITCHES
                               265 *
    0C20 C0 87 0222            266          B     HALT                   HALT E1
    0C24 C1E1             0C25 267          DC    AL2(HLTE1)
                               268 *
    0C26 30 00 1423            269          SNS   DSWS,X'00'             SENSE CPU SWITCHES
                               270 *
    0C2A C0 87 021E            271          B     UNPACK                 UNPACK
    0C2E 02               0C2E 272          DC    XL1'2'                   CPU  DATA
    0C2F 1423             0C30 273          DC    AL2(DSWS)                  SWITCH
    0C31 1427             0C32 274          DC    AL2(WORKN)                   ENTRY
                               275 *
    0C33 07 20 1427 1369       276 BGN0C    SZ    WORKN(3),D1(1)         CONVERT CYL
    0C39 F2 82 0A              277          JM    BGN0B                    ENTRY
    0C3C 0E 01 13EE 136B       278          ALC   CYL(2),ONE                 TO
    0C42 C0 87 0C33            279          B     BGN0C                        BINARY
                               280 *
    0C46 0D 01 13EE 137A       281 BGN0B    CLC   CYL(2),P209            PRINT MESSAGE AGAIN IF
    0C4C C0 84 0C09            282          BH    BGN0F                    CYLINDER ENTRY INVALID
                               283 *
    0C50 0C 00 1142 13F3       284 BGN0D    MVC   MSG05N(1),DRV          INITIALIZE PRINT MESSAGE
                               285 *
    0C56 C0 87 021A            286          B     PRINT                  PRINT MESSAGE
    0C5A 45               0C5A 287          DC    XL1'45'                  'XXXXXXXXXXXXX
    0C5B 29               0C5B 288          DC    AL1(MSG05N-MSG05)          TO BEGIN ON
    0C5C 1142             0C5D 289          DC    AL2(MSG05N)                  DRIVE X.'
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0C5E C1F1             0C5F  290         DC    AL2(HLTF1)
                               291 *
   0C60 3D 01 0A03             292         CLI   RTN,1                 JUMP IF NOT
   0C64 F2 01 10               293         JNE   BGNOE                   ROUTINE 1
                               294 *
   0C67 C0 87 021A             295         B     PRINT                 PRINT FIRST
   0C6B 01               0C6B  296         DC    XL1'01'                 LINE OF
   0C6C 50               0C6C  297         DC    AL1(MSG19N-MSG19)         CAUTION
   0C6D 12A6             0C6E  298         DC    AL2(MSG19N)                 MESSAGE
                               299 *
   0C6F C0 87 021A             300         B     PRINT                 PRINT SECOND
   0C73 05               0C73  301         DC    XL1'05'                 LINE OF
   0C74 49               0C74  302         DC    AL1(MSG1AN-MSG1A)         CAUTION
   0C75 12EF             0C76  303         DC    AL2(MSG1AN)                 MESSAGE
                               304 *
   0C77 C0 87 0222             305 BGNOE   B     HALT                  CAUTION HALT F1
   0C7B C1F1             0C7C  306         DC    AL2(HLTF1)
                               307 *
   0C7D C0 87 0000             308 BGNX    B     *-*                   RETURN TO CALLING ROUTINE
                               309 *
                               310 *-------------------------------------------------------------------
                               311 *             ADVANCE TRACK ADDRESS
                               312 *
   0C81 38 08 13E8             313 NXTRC   TBN   IND,STRT                GO TO PRINT STARTING
   0C95 C0 10 0F97             314         BT    START                     MESSAGE IF STRT IND ON
                               315 *
   0C89 0D 01 13F0 1365        316         CLC   HD(2),NULLS             JUMP IF HEAD
   0C8F F2 01 18               317         JNE   NXTRC1                    ADDRESS IS NOT 00
                               318 *
   0C92 0C 01 1427 13EE        319         MVC   WORKN(2),CYL            GO PRINT
   0C98 3D 00 1427             320 NXT01   CLI   WORKN,0                   TOTAL ERROR
   0C9C C0 81 0FB8             321         BZ    NORM                        MESSAGE
   0CA0 0F 00 1427 1370        322         SLC   WORKN(1),TEN                   EVERY
   0CA6 C0 02 0C98             323         BNM   NXT01                          TEN CYLINDERS
                               324 *
   0CAA 38 80 13E8             325 NXTRC1  TBN   IND,UNITCK              END SCAN IF
   0CAE 38 20 8001             326         TBN   DDDF+1,BIT2               END OF CYLINDER
   0CB2 F2 10 28               327         JT    NSCAN                       CONDITION DETECTED
                               328 *
   0CB5 0D 03 13F0 13EC        329         CLC   HD(4),MAXHD             BRANCH IF NO MORE
   0CB8 F2 81 1F               330         JE    NSCAN                     CYLINDERS TO BE TESTED
                               331 *
   0CBE 0E 01 13F0 136B        332         ALC   HD(2),ONE               ADVANCE HEAD ADDRESS
                               333 *
   0CC4 0D 01 13F0 1376        334         CLC   HD(2),NINTEN            BRANCH IF MORE
   0CCA F2 04 0C               335         JNH   NXTRCX                    HEADS TO BE TESTED
                               336 *
   0CCD 0C 01 13F0 1365        337         MVC   HD(2),NULLS             RESET TO HEAD ZERO
                               338 *
   0CD3 0E 01 13EE 136B        339         ALC   CYL(2),ONE              ADVANCE CYLINDER ADDRESS
                               340 *
   0CD9 C0 87 0000             341 NXTRCX  B     *-*                   RETURN TO CALLING ROUTINE
                               342 *
                               343 *-------------------------------------------------------------------
                               344 *             END DATA MODULE SCAN
                               345 *
   0CDD 0C 00 1162 13F3        346 NSCAN   MVC   MSG06N(1),DRV           MOVE DRV NUMBER TO END MSG
                               347 *
   0CE3 C0 87 021A             348         B     PRINT                   SPACE PRINTER 2 LINES
   0CE7 12               0CE7  349         DC    XL1'12'
                               350 *
   0CE8 C0 87 021A             351         B     PRINT                   PRINT MESSAGE
   0CEC 06               0CEC  352         DC    XL1'06'                   'END XXXXXXXXXXX ON DRV X'
   0CED 20               0CED  353         DC    AL1(MSG06N-MSG06)
   0CEE 1162             0CEF  354         DC    AL2(MSG06N)
                               355 *
   0CF0 36 30 020B             356         SBF   SBYTE3,SSW1A+SSW1B      RESET SENSE
   0CF4 3B C0 0200             357         SBF   SBYTE5,SSW28+SSW29        SWITCHES
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               358 *
   0CF8 C0 87 022A             359         B     LOAD                    TERMINATE SECTION
   0CFC 00               0CFC  360         DC    XL1'0'
                               361 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          363 ********************************************************************************
                          364 *                                                                              *
                          365 *              COMMAND EXECUTION SUBROUTINES                                   *
                          366 *                                                                              *
                          367 ********************************************************************************
                          368 *
                          369 *              RECALIBRATE  COMMAND
                          370 *
  0CFD 34 08 0D1E         371 RECAL     ST     RECALX+3,ARR            SAVE RETURN ADDRESS
                          372 *
  0D01 3C 00 13F6         373           MVI    Q,X'00'                 SETUP Q AND R
  0D05 3C 01 13F7         374           MVI    R,X'01'                   BYTES FOR SIO COMMAND
                          375 *
  0D09 0C 09 1421 1365    376           MVC    NN(10),NULLS            CLEAR DDCF AREA
                          377 *
  0D0F C0 87 0E62         378           B      XEQ                     GO TO EXECUTE COMMAND
                          379 *
  0D13 38 80 13E8         380           TBN    IND,UNITCK              GO TO ERROR
  0D17 C0 10 0F0B         381           BT     UCK                       PRINT IF UNIT CHECK
                          382 *
  0D1B C0 87 0000         383 RECALX    B      *-*                     RETURN TO CALLING ROUTINE
                          384 *
                          385 *-------------------------------------------------------------------------------
                          386 *              SEEK
                          387 *
  0D1F 34 08 0D52         388 SEEK      ST     SEEKX+3,ARR             SAVE RETURN ADDRESS
                          389 *
  0D23 38 80 13E8         390           TBN    IND,UNITCK              GO TO
  0D27 38 01 8000         391           TBN    DDDF,BIT7                 RECALIBRATE
  0D2B C0 10 0CFD         392           BT     RECAL                       IF SEEK CHECK
                          393 *
  0D2F 3C 00 13F6         394           MVI    Q,X'00'                 SETUP Q AND R
  0D33 3C 00 13F7         395           MVI    R,X'00'                   BYTES FOR SIO COMMAND
                          396 *
  0D37 0C 09 1421 1365    397           MVC    NN(10),NULLS            CLEAR DDCF AREA
                          398 *
  0D3D 0C 03 141C 13F0    399           MVC    HH(4),SKADR             MOVE SEEK ARGUMENT TO DDCF
                          400 *
  0D43 C0 87 0E62         401           B      XEQ                     GO TO EXECUTE COMMAND
                          402 *
  0D47 38 80 13E8         403           TBN    IND,UNITCK              GO TO ERROR
  0D4B C0 10 0F0B         404           BT     UCK                       PRINT IF UNIT CHECK
                          405 *
  0D4F C0 87 0000         406 SEEKX     B      *-*                     RETURN TO CALLING ROUTINE
                          407 *
                          408 *-------------------------------------------------------------------------------
                          409 *              READ HOME ADDRESS AND RECORD ZERO COUNT EVEN
                          410 *
  0D53 34 08 0D74         411 RDHAE     ST     RDHAEX+3,ARR            SAVE RETURN ADDRESS
                          412 *
  0D57 3C 01 13F6         413           MVI    Q,X'01'                 SETUP Q AND R
  0D5B 3C 01 13F7         414           MVI    R,X'01'                   BYTES FOR SIO COMMAND
                          415 *
  0D5F 0C 09 1421 1365    416           MVC    NN(10),NULLS            CLEAR DDCF AREA
                          417 *
  0D65 C0 87 0E62         418           B      XEQ                     GO TO EXECUTE COMMAND
                          419 *
  0D69 38 80 13E8         420           TBN    IND,UNITCK              GO TO ERROR
  0D6D C0 10 0F0B         421           BT     UCK                       PRINT IF UNIT CHECK
                          422 *
  0D71 C0 87 0000         423 RDHAEX    B      *-*                     RETURN TO CALLING ROUTINE
                          424 *
                          425 *-------------------------------------------------------------------------------
                          426 *              READ HOME ADDRESS AND RECORD ZERO COUNT ODD
                          427 *
  0D75 34 08 0D96         428 RDHAO     ST     RDHAOX+3,ARR            SAVE RETURN ADDRESS
                          429 *
  0D79 3C 01 13F6         430           MVI    Q,X'01'                 SETUP Q AND R
```



```
FRR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  0D7D 3C 09 13F7         431           MVI    R,X'09'                   BYTES FOR SIO COMMAND
                          432 *
  0D81 0C 09 1421 1365    433           MVC    NN(10),NULLS            CLEAR DDCF AREA
                          434 *
  0D87 C0 87 0E62         435           B      XEQ                     GO TO EXECUTE COMMAND
                          436 *
  0D8B 38 80 13E8         437           TBN    IND,UNITCK              GO TO ERROR
  0D8F C0 10 0F0B         438           BT     UCK                       PRINT IF UNIT CHECK
                          439 *
  0D93 C0 87 0000         440 RDHAOX    B      *-*                     RETURN TO CALLING ROUTINE
                          441 *
                          442 *-------------------------------------------------------------------------------
                          443 *              READ DIAGNOSTIC SENSE DATA
                          444 *
  0D97 34 08 0DBB         445 RDSNS     ST     RDSNSX+3,ARR            SAVE RETURN ADDRESS
                          446 *
  0D9B 0C 00 0DAE 13F4    447           MVC    SIOSNS+1(1),DRVADR      BUILD READ DIAG
  0DA1 3A 01 0DAE         448           SBN    SIOSNS+1,BIT7             SENSE COMMAND
                          449 *
  0DA5 31 C6 137E         450           LIO    DDCR,X'C6'              DDCF ADDRESS TO DDCR
  0DA9 31 C4 1380         451           LIO    DDDR,X'C4'              DDDF ADDRESS TO DDDR
                          452 *
  0DAD F3 00 07           453 SIOSNS    SIO    X'07',*-*               READ DIAGNOSTIC SENSE DATA
                          454 *
  0DB0 C1 C2 0DB0         455           TIO    *,X'C2'                 LOOP ON ATTACHMENT BUSY
                          456 *
  0DB4 3A 80 13E8         457           SBN    IND,UNITCK              SET UNIT CHECK INDICATOR
                          458 *
  0DB8 C0 87 0000         459 RDSNSX    B      *-*                     RETURN TO CALLING ROUTINE
                          460 *
                          461 *-------------------------------------------------------------------------------
                          462 *              WRITE HOME ADDRESS AND RECORD ZERO COUNT EVEN
                          463 *
  0DBC 34 08 0DEF         464 WRHAE     ST     WRHAEX+3,ARR            SAVE RETURN ADDRESS
                          465 *
  0DC0 3C 02 13F6         466           MVI    Q,X'02'                 SETUP Q AND R
  0DC4 3C 01 13F7         467           MVI    R,X'01'                   BYTES FOR SIO COMMAND
                          468 *
  0DC8 0C 09 1421 1365    469           MVC    NN(10),NULLS            CLEAR DDCF AREA
  0DCE 0C 03 141C 13F0    470           MVC    HH(4),SKADR             SET UP CURRENT SEEK ADDRESS
  0DD4 0C 02 1420 136F    471           MVC    DL(3),EIGHT             SET UP KL AND DL BYTES
                          472 *
  0DDA 0C 07 8007 1365    473           MVC    DDDF+7(8),NULLS         SET FIRST 8 BYTES OF DDDF TO 0
                          474 *
  0DE0 C0 87 0E62         475           B      XEQ                     GO TO EXECUTE COMMAND
                          476 *
  0DE4 38 80 13E8         477           TBN    IND,UNITCK              GO TO ERROR
  0DE8 C0 10 0F0B         478           BT     UCK                       PRINT IF UNIT CHECK
                          479 *
  0DEC C0 87 0000         480 WRHAEX    B      *-*                     RETURN TO CALLING ROUTINE
                          481 *
                          482 *-------------------------------------------------------------------------------
                          483 *              WRITE HOME ADDRESS AND RECORD ZERO COUNT ODD
                          484 *
  0DF0 34 08 0E23         485 WRHAO     ST     WRHAOX+3,ARR            SAVE RETURN ADDRESS
                          486 *
  0DF4 3C 02 13F6         487           MVI    Q,X'02'                 SETUP Q AND R
  0DF8 3C 09 13F7         488           MVI    R,X'09'                   BYTES FOR SIO COMMAND
                          489 *
  0DFC 0C 09 1421 1365    490           MVC    NN(10),NULLS            CLEAR DDCF AREA
  0E02 0C 03 141C 13F0    491           MVC    HH(4),SKADR             SET UP CURRENT SEEK ADDRESS
  0E08 0C 02 1420 136F    492           MVC    DL(3),EIGHT             SET UP KL AND DL BYTES
                          493 *
  0E0E 0C 07 8007 1365    494           MVC    DDDF+7(8),NULLS         SET FIRST 8 BYTES OF DDDF TO 0
                          495 *
  0E14 C0 87 0E62         496           B      XEQ                     GO TO EXECUTE COMMAND
                          497 *
  0E18 38 80 13E8         498           TBN    IND,UNITCK              GO TO ERROR
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E1C C0 10 0F0B            499          BT    UCK                    PRINT IF UNIT CHECK
                              500 *
   0E20 C0 87 0000            501 WRHAOX   B     *-*                    RETURN TO CALLING ROUTINE
                              502 *
                              503 *-------------------------------------------------------------------
                              504 *              WRITE COUNT COMPRESSED DATA
                              505 *
   0E24 34 08 0E61            506 WRCCD    ST    WRCCDX+3,ARR           SAVE RETURN ADDRESS
                              507 *
   0E28 3C 02 13F6            508          MVI   Q,X'02'                SETUP Q AND R
   0E2C 3C 08 13F7            509          MVI   R,X'08'                  BYTES FOR SIO COMMAND
                              510 *
   0E30 0C 09 1421 1365       511          MVC   NN(10),NULLS           CLEAR DDCF AREA
   0E36 0C 03 141C 13F0       512          MVC   HH(4),SKADR            SET UP CURRENT SEEK ADDRESS
   0E3C 3C 2F 1421            513          MVI   NN,X'2F'               SET UP NN BYTE FOR 47 RECORDS
   0E40 3C 01 141F            514          MVI   DL-1,X'01'             SET UP DL BYTE FOR 256 BYTES
   0E44 3C 01 141D            515          MVI   RR,X'01'               SET UP RR BYTE FOR RECORD 1
                              516 *
   0E48 3C 00 80FF            517          MVI   DDDFN,X'0'             SET DDDF AREA
   0E4C 0C FE 80FE 80FF       518          MVC   DDDFN-1(255),DDDFN       TO ALL 0'S
                              519 *
   0E52 C0 87 0E62            520          B     XEQ                    GO TO EXECUTE COMMAND
                              521 *
   0E56 38 80 13E8            522          TBN   IND,UNITCK             GO TO ERROR PRINT
   0E5A C0 10 0F0B            523          BT    UCK                      IF UNIT CHECK
                              524 *
   0E5E C0 87 0000            525 WRCCDX   B     *-*                    RETURN TO CALLING ROUTINE
                              526 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              528 ********************************************************************
                              529 *                                                                  *
                              530 *              COMMON COMMAND EXECUTION SUBROUTINE                 *
                              531 *                                                                  *
                              532 ********************************************************************
                              533 *
   0E62 34 08 0ED3            534 XEQ      ST    XEQX+3,ARR             SAVE RETURN ADDRESS
                              535 *
   0E66 C0 87 0212            536          B     TEST                   CHECK FOR USER INTERVENTION
                              537 *
   0E6A 0C 00 0EA9 13F6       538          MVC   SIO+1(1),Q             MOVE Q AND R
   0E70 0C 00 0EAA 13F7       539          MVC   SIO+2(1),R               BYTES TO SIO
                              540 *
   0E76 0E 00 0EA9 13F4       541          ALC   SIO+1(1),DRVADR        ADD DRIVE ADDRESS TO Q BYTE
                              542 *
   0E7C 0C 00 0EA5 13F4       543          MVC   TIORDY+1(1),DRVADR     SETUP Q BYTE IN TIO
   0E82 0C 00 0EB0 13F4       544          MVC   TIOBSY+1(1),DRVADR       'NOT RDY / UNIT CHECK' AND
   0E88 3A 01 0EB0            545          SBN   TIOBSY+1,BIT7              'SEEK BUSY' INSTRUCTIONS
                              546 *
   0E8C 30 C5 13F2            547          SNS   SNS,X'C5'              SENSE ADAPTER STATUS
                              548 *
   0E90 38 01 13F2            549          TBN   SNS,BIT7               BRANCH IF
   0E94 C0 10 0ED4            550          BT    ACK                      ADAPTER CHECK
                              551 *
   0E98 31 C6 137E            552          LIO   DDCR,X'C6'             LOAD DDCF ADDRESS IN DDCR
   0E9C 31 C4 1380            553          LIO   DDDR,X'C4'             LOAD DDDF ADDRESS IN DDDR
                              554 *
   0EA0 3B 80 13E8            555          SBF   IND,UNITCK             RESET UNIT CHECK INDICATOR
                              556 *
   0EA4 C1 00 0ECC            557 TIORDY   TIO   XEQ01,*-*              BRANCH IF DRIVE NOT READY
                              558 *
   0EA8 F3 00 00              559 SIO      SIO   *-*,*-*                ISSUE START I/O COMMAND
                              560 *
   0EAB C1 C2 0EAB            561          TIO   *,X'C2'                LOOP ON ATTACHMENT BUSY
                              562 *
   0EAF C1 00 0EAF            563 TIOBSY   TIO   *,*-*                  LOOP ON SEEK BUSY
                              564 *
   0EB3 30 C5 13F2            565          SNS   SNS,X'C5'              SENSE ADAPTER STATUS
                              566 *
   0EB7 38 01 13F2            567          TBN   SNS,BIT7               BRANCH IF
   0EBB C0 10 0ED4            568          BT    ACK                      ADAPTER CHECK
                              569 *
   0EBF 0C 00 0EC6 13F5       570          MVC   *+7(1),UCKMSK          RETURN TO
   0EC5 39 00 13F1            571          TBF   SNS-1,*-*                CALLING ROUTINE
   0EC9 F2 10 04              572          BT    XEQX                       IF NO UNIT CHECK
                              573 *
   0ECC C0 87 0D97            574 XEQ01    B     RDSNS                  READ DIAGNOSTIC SENSE
                              575 *
   0ED0 C0 87 0000            576 XEQX     B     *-*                    RETURN TO CALLING ROUTINE
                              577 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          579 ********************************************************************************
                          580 *                                                                              *
                          581 *                        TRACK ENDING CONDITIONS                               *
                          582 *                                                                              *
                          583 ********************************************************************************
                          584 *
                          585 *                ADAPTER CHECK
                          586 *
 0ED4 0C 5F 13E6 13E7     587 ACK      MVC   MSGN(96),MSGN+1          CLEAR MESSAGE BUFFER
                          588 *
 0EDA 3A 80 1012          589          SBN   PRTFLG,BIT0              SET ERROR PRINT FLAG
 0EDE 3A 40 13E8          590          SBN   IND,ERRHLT               SET ERROR HALT INDICATOR
                          591 *
 0EE2 3C 5C 1387          592          MVI   MSG,C'*'                 ERROR MESSAGE
 0EE6 0C 0D 13A5 1170     593          MVC   MSG+30,MSG07N(14)          TO PRINT BUFFER
                          594 *
 0EEC 3C 00 8018          595          MVI   DDDF+24,0                CLEAR DDDF AREA
 0EF0 0C 17 8017 8018     596          MVC   DDDF+23(24),DDDF+24
                          597 *
 0EF6 0C 01 8001 13F2     598          MVC   DDDF+1(2),SNS            BUILD
 0EFC 31 C7 1384          599          LIO   SNS23,X'C7'                FORMAT 3
 0F00 30 C7 8003          600          SNS   DDDF+3,X'C7'                 DIAGNOSTIC
 0F04 3C 30 8007          601          MVI   DDDF+7,X'30'                   SENSE DATA
                          602 *
 0F08 F2 87 44            603          J     PRTSNS                   GO TO PRINT SENSE DATA
                          604 *
                          605 *--------------------------------------------------------------------------
                          606 *                UNIT CHECK
                          607 *
 0F0B 0C 5F 13E4 13E7     608 UCK      MVC   MSGN(96),MSGN+1          CLEAR MESSAGE BUFFER
                          609 *
 0F11 3A 80 1012          610          SBN   PRTFLG,BIT0              SET ERROR PRINT INDICATOR
 0F15 3B 40 13E8          611          SBF   IND,ERRHLT               RESET ERROR HALT INDICATOR
                          612 *
 0F19 38 01 8000          613          TBN   DDDF,BIT7                BRANCH IF
 0F1D F2 10 18            614          JT    SCK                        SEEK CHECK
                          615 *
 0F20 38 08 8000          616          TBN   DDDF,BIT4                BRANCH IF
 0F24 F2 10 1E            617          JT    DCK                        DATA CHECK
                          618 *
 0F27 3A 40 13E8          619          SBN   IND,ERRHLT               SET ERROR HALT INDICATOR
                          620 *
 0F2B 3C 5C 1387          621 UCK01    MVI   MSG,C'*'                 ERROR MESSAGE
 0F2F 0C 0D 13A5 117E     622          MVC   MSG+30,MSG08N(14)          TO PRINT BUFFER
                          623 *
 0F35 F2 87 17            624          J     PRTSNS                   GO TO PRINT SENSE DATA
                          625 *
                          626 *--------------------------------------------------------------------------
                          627 *                SEEK CHECK
                          628 *
 0F38 3C 5C 1387          629 SCK      MVI   MSG,C'*'                 ERROR MESSAGE
 0F3C 0C 0D 13A5 118C     630          MVC   MSG+30,MSG09N(14)          TO PRINT BUFFER
                          631 *
 0F42 F2 87 0A            632          J     PRTSNS                   GO TO PRINT SENSE DATA
                          633 *
                          634 *--------------------------------------------------------------------------
                          635 *                DATA CHECK
                          636 *
 0F45 3C 5C 1387          637 DCK      MVI   MSG,C'*'                 ERROR MESSAGE
 0F49 0C 0D 13A5 119A     638          MVC   MSG+30,MSG10N(14)          TO PRINT BUFFER
                          639 *
 0F4F C0 87 021E          640 PRTSNS   B     UNPACK                   UNPACK
 0F53 18            0F53  641          DC    IL1'24'                    SENSE DATA
 0F54 8017          0F55  642          DC    AL2(DDDF+23)                 TO MESSAGE
 0F56 13E6          0F57  643          DC    AL2(MSGN)                      BUFFER AREA
                          644 *
 0F58 F2 87 75            645          J     PRTMSG                   GO TO PRINT MESSAGE
                          646 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0F5B 0C 5F 13E6 13E7     647 *--------------------------------------------------------------------------
                          648 *                FLAG BYTE RESTORED
                          649 *
 0F61 3B 80 1012          650 RSTMSG   MVC   MSGN(96),MSGN+1          CLEAR MESSAGE BUFFER
 0F65 3B 40 13E8          651 *
                          652          SBF   PRTFLG,BIT0              RESET ERROR PRINT INDICATOR
 0F69 3C C9 1387          653          SBF   IND,ERRHLT               RESET ERROR HALT INDICATOR
 0F6D 0C 2D 13C5 124A     654 *
                          655          MVI   MSG,C'I'                 INFORMATION MESSAGE
 0F73 38 30 13E8          656          MVC   MSG+62(46),MSG18A          TO PRINT BUFFER
 0F77 F2 10 16            657 *
                          658          TBN   IND,RSTEVN+RSTODD        JUMP IF BOTH EVEN AND
 0F7A 38 10 13E8          659          JT    RST02                      ODD WERE RESTORED
 0F7E F2 10 09            660 *
                          661          TBN   IND,RSTODD               JUMP IF ONL  ODD
 0F81 0C 06 13C5 1256     662          JT    RST01                      WAS RESTORED
 0F87 F2 87 06            663 *
                          664          MVC   MSG+62(7),MSG18N         MODIFY MESSAGE FOR
                          665          J     RST02                      EVEN ONLY
 0F8A 0C 0B 13C5 1256     666 *
                          667 RST01    MVC   MSG+62(12),MSG18N        MODIFY MESSAGE FOR ODD ONLY
 0F90 3B 30 13E8          668 *
                          669 RST02    SBF   IND,RSTEVN+RSTODD        TURN OFF BOTH INDICATORS
 0F94 F2 87 39            670 *
                          671          J     PRTMSG                   GO TO PRINT MESSAGE
                          672 *
                          673 *--------------------------------------------------------------------------
                          674 *                BEGINNING OF ROUTINE
                          675 *
 0F97 0C 5F 13E6 13E7     676 START    MVC   MSGN(96),MSGN+1          CLEAR MESSAGE BUFFER
                          677 *
 0F9D 3B 80 1012          678          SBF   PRTFLG,BIT0              RESET ERROR PRINT INDICATOR
 0FA1 3B 48 13E8          679          SBF   IND,ERRHLT+STRT          RESET ERROR HALT & STRT INDS
 0FA5 0C 02 11D7 1368     680          MVC   MSG15N(3),ZEROS          INITIALIZE TOTAL ERROR MSG
                          681 *
 0FAB 3C C9 1387          682          MVI   MSG,C'I'                 INFORMATION MESSAGE
                          683 *
 0FAF 0C 11 13A9 11AC     684          MVC   MSG+34(18),MSG14N          COMPLETE PRINT MESSAGE
                          685 *
 0FB5 F2 87 18            686          J     PRTMSG                   GO TO PRINT MESSAGE
                          687 *
                          688 *--------------------------------------------------------------------------
                          689 *                TOTAL ERROR MESSAGE EVERY 10 CYLINDERS
                          690 *
 0FB8 0C 5F 13E6 13E7     691 NORM     MVC   MSGN(96),MSGN+1          CLEAR MESSAGE BUFFER
                          692 *
 0FBE 3B 80 1012          693          SBF   PRTFLG,BIT0              RESET ERROR PRINT INDICATOR
 0FC2 3B 40 13E8          694          SBF   IND,ERRHLT               RESET ERROR HALT INDICATOR
                          695 *
 0FC6 3C C9 1387          696          MVI   MSG,C'I'                 INFORMATION MESSAGE
                          697 *
 0FCA 0C 2A 13C2 11D7     698          MVC   MSG+59(43),MSG15N          COMPLETE PRINT MESSAGE
                          699 *
                          700 *--------------------------------------------------------------------------
                          701 *                PRINT MESSAGE
                          702 *
 0FD0 0C 02 11DF 1368     703 PRTMSG   MVC   MSG16B(3),ZEROS           INITIALIZE CYLINDER AND
 0FD6 0C 01 11E6 1368     704          MVC   MSG16N(2),ZEROS            HEAD VALUES IN PRINT MESSAGE
                          705 *
 0FDC 0C 03 1427 13F0     706          MVC   WORK+3(4),SKADR          SEEK ADDR TO WORK AREA
                          707 *
 0FE2 0F 00 1425 1369     708 PRTCYL   SLC   WORK+1(1),ONE            CONVERT
 0FE8 F2 82 0A            709          JM    PRTHD                      CYLINDER TO
 0FEB 06 20 11DF 1369     710          AZ    MSG16B(3),D1(1)              DECIMAL FOR
 0FF1 C0 87 0FE2          711          B     PRTCYL                         PRINTOUT
                          712 *
 0FF5 0F 01 1427 136B     713 PRTHD    SLC   WORK+3(2),ONE            CONVERT
 0FFB F2 82 0A            714          JM    PRT                        HEAD TO
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   OFFE 06 10 11E6 1369       715          AZ    MSG16N(2),D1(1)          DECIMAL FOR
   1004 C0 87 0FF5            716          B     PRTHD                      PRINTOUT
                              717 *
   1008 0C 0E 1396 11E6       718 PRT      MVC   MSG+15(15),MSG16N        COMPLETE PRINT MESSAGE
                              719 *
   100E C0 87 021A            720          B     PRINT                    PRINT MESSAGE
   1012 02              1012  721 PRTFLG   DC    XL1'02'                    CYL XXX, HD XX - ETC.
   1013 60              1013  722          DC    IL1'96'
   1014 13E6            1015  723          DC    AL2(MSGN)
                              724 *
   1016 38 80 1012            725          TBN   PRTFLG,BIT0              JUMP IF ERROR PRINT
   101A F2 90 06              726          JF    PRT01                      INDICATOR NOT ON
                              727 *
   101D 06 20 11D7 1369       728          AZ    MSG15N(3),D1(1)          INCREMENT TOTAL ERROR MSG
                              729 *
   1023 38 40 13E8            730 PRT01    TBN   IND,ERRHLT                GO TO TEST NEXT TRACK
   1027 C0 90 0CAA            731          BF    NXTRC1                     IF NO ERROR HALT REQUIRED
                              732 *
   102B C0 87 021A            733          B     PRINT                    SPACE PRINTER 2 LINES
   102F 92              102F  734          DC    XL1'92'
                              735 *
   1030 C0 87 021A            736          B     PRINT                    PRINT MESSAGE
   1034 C6              1034  737          DC    XL1'C6'                    'XXXXXXXXXXX TERMINATED'
   1035 36              1035  738          DC    AL1(MSG17N-MSG17)
   1036 121C            1037  739          DC    AL2(MSG17M)
   1038 C101            1039  740          DC    AL2(HLT01)
                              741 *
   103A 3B 30 020B            742          SBF   SBYTE3,SSW1A+SSW1B       RESET SENSE
   103E 3B C0 020D            743          SBF   SBYTE5,SSW28+SSW29         SWITCHES
                              744 *
   1042 C0 87 0222            745          B     HALT                     ERROR HALT 01
   1046 C101            1047  746          DC    AL2(HLT01)
                              747 *
   1048 C0 87 022A            748          B     LOAD                     TERMINATE SECTION
   104C 00              104C  749          DC    XL1'0'
                              750 *
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              752 ********************************************************************************
                              753 *                                                                              *
                              754 *        INTERFACE TO MICROCODE LOADER PROGRAM (SECTION C17)                   *
                              755 *                                                                              *
                              756 ********************************************************************************
                              757 *
   104D 34 08 1081            758 MPL      ST    MPLX+3,ARR               SAVE RETURN ADDRESS
                              759 *
   1051 0D 01 0A1C 1079       760          CLC   LDRID(2),C17             GO TO LOAD LOADER
   1057 F2 01 09              761          JNE   LDRLD                      IF NOT ALREADY IN STG
                              762 *
   105A 0D 01 3C01 1079       763          CLC   LDR+1(2),C17             BRANCH IF SECTION C17
   1060 F2 81 17              764          JE    LDRGO                      IS ALREADY IN MAIN STORAGE
                              765 *
   1063 C0 87 021A            766 LDRLD    B     PRINT                    PRINT MESSAGE
   1067 46              1067  767          DC    XL1'46'                    LOADING SECTION C17
   1068 13              1068  768          DC    AL1(MSG01N-MSG01)
   1069 1094            106A  769          DC    AL2(MSG01N)
   106B C100            106C  770          DC    AL2(HLT00)
                              771 *
   106D 0C 18 0A39 0A18       772          MVC   SVPFC(25),COM-1          SAVE SECTION PREFACE
                              773 *
   1073 C0 87 022A            774          B     LOAD                     LOAD SECTION C17
   1077 04              1077  775          DC    XL1'04'
   1078 0C17            1079  776 C17      DC    XL2'0C17'
                              777 *
   107A C0 87 3C02            778 LDRGO    B     LDR+2                    GO TO SECTION C17
                              779 *
   107E C0 87 0000            780 MPLX     B     *-*                      RETURN TO CALLING ROUTINE
                              781 *
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                783 ********************************************************************************
                                784 *                                                                              *
                                785 *                              PRINT MESSAGES                                  *
                                786 *                                                                              *
                                787 ********************************************************************************
                                788 *
                          1081  789 MSG01    EQU   *-1
1082 D3D6C1C4C9D5C740     1094  790 MSG01N   DC    CL19'LOADING SECTION C17'
108A E2C5C3E3C9D6D540           790
1092 C3F1F7                     790
                                791 *
                          1094  792 MSG02    EQU   *-1
1095 E2C5D3C5C3E340C4     10AE  793         DC    CL26'SELECT DRIVE TO BE USED.  '
109D D9C9E5C540E3D640           793
10A5 C2C540E4E2C5C44B           793
10AD 4040                       793
10AF E2D5E240E2E6E240     10DA  794 MSG02N   DC    CL44'SNS SWS 1A-1B SELECT DRIVES 1-2 RESPECTIVELY'
10E7 F1C160F1C240E2C5           794
10BF D3C5C3E340C4D9C9           794
10C7 E5C5E240F160F240           794
10CF D9C5E2D7C5C3E3C9           794
10D7 E5C5D3E8                   794
                                795 *
                          10DA  796 MSG03    EQU   *-1
10DB E2D5E240E2E6E240     1108  797 MSG03N   DC    CL46'SNS SWS 1A-1B INVALID.  ONLY ONE SHOULD BE ON.'
10E3 F1C160F1C240C9D5           797
10EB E5C1D3C9C44B4040           797
10F3 D6D5D3E840D6D5C5           797
10FB 40E2C8D6E4D3C440           797
1103 C2C540D6D54B               797
                                798 *
                          1108  799 MSG04    EQU   *-1
1109 C4D9C9E5C540E7       110F  800 MSG04A   DC    CL07'DRIVE X'
1110 40D5D6E340D9C5C1     1119  801 MSG04N   DC    CL10' NOT READY'
1118 C4E8                       801
                                802 *
                          1119  803 MSG05    EQU   *-1
111A E7E7E7E7E7E7E7E7     1127  804 MSG05A   DC    CL14'XXXXXXXXXXXXXX'
1122 E7E7E7E7E7E7               804
1128 40E3D640C2C540D7     1142  805 MSG05N   DC    CL27' TO BE PERFORMED ON DRIVE X'
1130 C5D9C6D6D9D4C5C4           805
1138 40D6D540C4D9C9E5           805
1140 C540E7                     805
                                806 *
                          1142  807 MSG06    EQU   *-1
1143 C5D5C440D6C640E7     1157  808 MSG06A   DC    CL21'END OF XXXXXXXXXXXXXX'
114B E7E7E7E7E7E7E7E7           808
1153 E7E7E7E7E7                 808
1158 40D6D540C4D9C9E5     1162  809 MSG06N   DC    CL11' ON DRIVE X'
1160 C540E7                     809
                                810 *
                          1162  811 MSG07    EQU   *-1
1163 6040C1C4C1D7E3C5     1170  812 MSG07N   DC    CL14'- ADAPTER CK -'
116B D940C3D24060               812
                                813 *
                          1170  814 MSG08    EQU   *-1
1171 6040E4D5C9E340C3     117E  815 MSG08N   DC    CL14'- UNIT CHECK -'
1179 C8C5C3D24060               815
                                816 *
                          117E  817 MSG09    EQU   *-1
117F 6040E2C5C5D240C3     118C  818 MSG09N   DC    CL14'- SEEK CHECK -'
1187 C8C5C3D24060               818
                                819 *
                          118C  820 MSG10    EQU   *-1
118D 6040C4C1E3C140C3     119A  821 MSG10N   DC    CL14'- DATA CHECK -'
1195 C8C5C3D24060               821
                                822 *
                          119A  823 MSG14    EQU   *-1
```



```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

1198 6040E2E3C1D9E3C9     11AC  824 MSG14N   DC    CL18'- STARTING ADDRESS'
11A3 D5C740C1C4C4D9C5           824
11AB E2E2                       824
                                825 *
                          11AC  826 MSG15    EQU   *-1
11AD 6040E3D6E3C1D340     11D1  827         DC    CL37'- TOTAL ERRORS FROM STARTING ADDRESS '
11B5 C5D9D9D6D9E240C6           827
11BD D9D6D440E2E3C1D9           827
11C5 E3C9D5C740C1C4C4           827
11CD D9C5E2E240                 827
11D2 404040E7E7E7         11D7  828 MSG15N   DC    CL06'   XXX'
                                829 *
                          11D7  830 MSG16    EQU   *-1
11D8 40C3E8D340E7E7E7     11DF  831 MSG16B   DC    CL8' CYL XXX'
11E0 6B40C8C440E7E7       11E6  832 MSG16N   DC    CL7', HD XX'
                                833 *
                          11E6  834 MSG17    EQU   *-1
11E7 E7E7E7E7E7E7E7E7     11F4  835 MSG17A   DC    CL14'XXXXXXXXXXXXXX'
11EF E7E7E7E7E7E7               835
11F5 40E3C5D9D4C9D5C1     121C  836 MSG17N   DC    CL40' TERMINATED BECAUSE OF PRECEEDING ERROR.'
11FD E3C5C440C2C5C3C1           836
1205 E4E2C540D6C640D7           836
120D D9C5C3C5C5C4C9D5           836
1215 C740C5D9D9D6D94B           836
                                837 *
                          121C  838 MSG18    EQU   *-1
121C 6040C8C140C6D3C1     124A  839 MSG18A   DC    CL46'- HA FLAG BYTE RESTORED TO 00     EVEN AND ODD'
1225 C740C2E8E3C540D9           839
122D C5E2F3D6D9C5C440           839
1235 E3D640F0F0404040           839
123D 4040C5E5C5D540C1           839
1245 D5C440D6C4C4               839
1248 D6C4C44040D6D5D3     1256  840 MSG18N   DC    CL12'ODD  ONLY   '
1253 E8404040                   840
                                841 *
                          1256  842 MSG19    EQU   *-1
1257 606040C3C1E4E3C9     127E  843         DC    CL40'-- CAUTION -- THIS ROUTINE WILL PERFORM '
125F D6D5406060406E3C8          843
1267 C9E24DD9D6E4E3C9           843
126F D5C540E6C9D3D340           843
1277 D7C5D9C6D6D9D440           843
127F C140C4C9E2D240C9     12A6  844 MSG19N   DC    CL40'A DISK INITIALIZATION, AND WILL DESTROY '
1287 D5C9E3C9C1D3C9E9           844
128F C1E3C9D6D56B40C1           844
1297 D5C440E6C9D3D340           844
129F C4C5E2E3D9D6E840           844
                                845 *
                          12A6  846 MSG1A    EQU   *-1
12A7 C1D3D340C5E7C9E2     12CE  847         DC    CL40'ALL EXISTING CUSTOMER DATA ON THE SELECT'
12AF E3C9D5C740C3E4E2           847
12B7 E3D6D4C5D940C4C1           847
12BF E3C140D6D540E3C8           847
12C7 C540E2C5D3C5C3E3           847
12CF C5C440C4D9C9E5C5     12EF  848 MSG1AN   DC    CL33'ED DRIVE. RESET HALT TO CONTINUE.'
12D7 4B40D9C5E2C5E340           848
12DF C8C1D3E340E2D640           848
12E7 C3D6D5E3C9D5E4C5           848
12EF 4B                         848
                                849 *
                          12EF  850 MSG1B    EQU   *-1
12F0 C5D5E3C5D940C4C5     1317  851         DC    CL40'ENTER DESIRED STARTING CYLINDER ADDRESS '
12F8 E2C9D9C5C440E2E3           851
1300 C1D9E3C9D5C740C3           851
1308 E8D3C9D5C4C5D940           851
1310 C1C4C4D9C5E2E240           851
1318 C9D5E3D640C3D7E4     133F  852 MSG1BN   DC    CL40'INTO CPU DATA SWITCHES IN DECIMAL (XCCC)'
1320 40C4C1E3C140E2E6           852
1328 C9E3C3C8C5E240C9           852
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1330 D540C4C5C3C9D4C1       852
   1338 D3404DE7C3C3C35D       852
                               853 *
   1340 C9D5C9E3C9C1D3C9 134D  854 MINT     DC    CL14'INITIALIZATION'    MESSAGE FOR INITIALIZE RTN
   1348 E9C1E3C9D6D5           854
                               855 *
   134E 40C6D3C1C740D9C5 135B  856 MREST    DC    CL14' FLAG RESTORE '    MSG FOR HA FLAG RESTORE ROUTINE
   1356 E2E3D6D9C540           856
                               857 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                             859 ********************************************************************************
                             860 *                                                                              *
                             861 *                  CONSTANTS AND RESERVED STORAGE AREAS                        *
                             862 *                                                                              *
                             863 ********************************************************************************
                             864 *
                             865 *               CONSTANTS
                             866 *
   135C 0000000000000000 1365 867 NULLS    DC    10XL1'00'
   1364 0000                 867
                             868 *
   1366 F0F0F0           1368 869 ZEROS    DC    CL3'000'
                             870 *
   1369 F1               1369 871 D1       DC    CL1'1'
                             872 *
   136A 0001             136B 873 ONE      DC    IL2'1'
   136C 00000008         136F 874 EIGHT    DC    IL4'8'
   1370 0A               1370 875 TEN      DC    IL1'10'
   1371 0007             1372 876 P7       DC    IL2'7'
   1373 0011             1374 877 P17      DC    IL2'17'
   1375 0013             1376 878 NINTEN   DC    IL2'19'
   1377 0022             1378 879 P34      DC    IL2'34'
   1379 00D1             137A 880 P209     DC    IL2'209'
   137B 011E             137C 881 P286     DC    IL2'286'
                             882 *
   137D 1418             137E 883 DDCR     DC    AL2(DDCF)           INITIAL DDCR INITIALIZATION VALUE
   137F 8000             1380 884 DDDR     DC    AL2(DDDF)           INITIAL DDDR INITIALIZATION VALUE
                             885 *
                             886 *--------------------------------------------------------------------------
                             887 *               SVP INTERFACE CONTROL BYTES
                             888 *
   1381 0003             1382 889 SVPREQ   DC    XL2'0003'             SET SVP REQUEST
   1383 C009             1384 890 SNS23    DC    XL2'C009'             SENSE ADAPTER ERROR BYTES
   1385 0809             1386 891 CEMR     DC    XL2'0809'             CE MODE IND --> X REG
                             892 *
                             893 *--------------------------------------------------------------------------
                             894 *               COMMON INDICATORS AND WORK AREAS
                             895 *
                        1387 896 MSG      EQU   *
   1387                 13E6 897 MSGN     DS    CL96                  MESSAGE PRINT BUFFER
   13E7 00              13E7 898          DC    XL1'00'
                             899 *
   13E8 00              13E8 900 IND      DC    XL1'0'                PROGRAM INDICATORS
                             901 *
   13E9                 13EA 902 MAXCYL   DS    XL2                   MAXIMUM VALID CYLINDER ADDRESS
   13EB                 13EC 903 MAXHD    DS    XL2                   MAXIMUM VALID HEAD ADDRESS
                             904 *
                        13F0 905 SKADR    EQU   *+3                   CURRENT SEEK ADDRESS
   13ED                 13EE 906 CYL      DS    XL2                   CURRENT CYLINDER ADDRESS
   13EF                 13F0 907 HD       DS    XL2                   CURRENT HEAD ADDRESS
                             908 *
   13F1                 13F2 909 SNS      DS    XL2                   ADAPTER SENSE INFO
                             910 *
   13F3                 13F3 911 DRV      DS    CL1                   DRIVE NUMBER
   13F4                 13F4 912 DRVADR   DS    XL1                   DRIVE ADDRESS
                             913 *
   13F5                 13F5 914 UCKMSK   DS    XL1                   UNIT CHECK MASK
                             915 *
   13F6                 13F6 916 Q        DS    XL1                   SIO Q BYTE
   13F7                 13F7 917 R        DS    XL1                   SIO R BYTE
                             918 *
                        13FC 919 HAE      EQU   *+4                   HOME ADDRESS EVEN
   13F8                 13F8 920 FFHAE    DS    XL1
   13F9                 13FA 921 CCHAE    DS    XL2
   13FB                 13FC 922 HHHAE    DS    XL2
                             923 *
                        1401 924 HAO      EQU   *+4                   HOME ADDRESS ODD
   13FD                 13FD 925 FFHAO    DS    XL1
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   13FE                  13FF  926 CCHAO    DS    XL2
   1400                  1401  927 HHHAO    DS    XL2
                               928 *
                         140A  929 ROE      EQU   *+8      RECORD ZERO COUNT EVEN
   1402                  1402  930 FFROE    DS    XL1
   1403                  1404  931 CCROE    DS    XL2
   1405                  1406  932 HHROE    DS    XL2
   1407                  1407  933 RRROE    DS    XL1
   1408                  1408  934 KLROE    DS    XL1
   1409                  140A  935 DLROE    DS    XL2
                               936 *
                         1413  937 ROO      EQU   *+8      RECORD ZERO COUNT ODD
   140B                  140B  938 FFROO    DS    XL1
   140C                  140D  939 CCROO    DS    XL2
   140E                  140F  940 HHROO    DS    XL2
   1410                  1410  941 RRROO    DS    XL1
   1411                  1411  942 KLROO    DS    XL1
   1412                  1413  943 DLROO    DS    XL2
                               944 *
   1414                  1415  945 SKDEVN   DS    XL2    EVEN SKIP DISPLACEMENT
   1416                  1417  946 SKDODD   DS    XL2    ODD  SKIP DISPLACEMENT
                               947 *
                         1418  948 DDCF     EQU   *      DDCF AREA
   1418                  1418  949 FF       DS    XL1
   1419                  141A  950 CC       DS    XL2
   141B                  141C  951 HH       DS    XL2
   141D                  141D  952 RR       DS    XL1
   141E                  141E  953 KL       DS    XL1
   141F                  1420  954 DL       DS    XL2
   1421                  1421  955 NN       DS    XL1
                               956 *
   1422                  1423  957 DSWS     DS    XL2    CPU DATA SWITCH AREA
                               958 *
                         1424  959 WORK     EQU   *      GENERAL PURPOSE
   1424                  1427  960 WORKN    DS    XL4      WORK AREA
                               961 *
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                               962 ********************************************************************************
                               963 *                                                                              *
                               964 *                          SYMBOL DEFINITIONS                                  *
                               965 *                                                                              *
                               966 ********************************************************************************
                               967 *
                               968 *                    LOCAL STORE REGISTERS
                               969 *
0001                           970 XR1      EQU   X'01'          INDEX REGISTER 1
                               971 *
0008                           972 ARR      EQU   X'08'          CURRENT LEVEL ADDRESS RECALL REG
                               973 *
                               974 *--------------------------------------------------------------------------------
                               975 *                    SECTION SENSE SWITCHES
                               976 *
0020                           977 SSW1A    EQU   X'20'          USE DRIVE 1 ONLY
0010                           978 SSW1B    EQU   X'10'          USE DRIVE 2 ONLY
                               979 *
0080                           980 SSW28    EQU   X'80'          ALLOW STARTING CYLINDER ADDRESS
0040                           981 SSW29    EQU   X'40'          ALLOW FORCED WRHA
                               982 *
                               983 *--------------------------------------------------------------------------------
                               984 *                    MESSAGE / HALT IDENTIFIERS
                               985 *
C100                           986 HLT00    EQU   X'C100'        NO HALT
C101                           987 HLT01    EQU   X'C101'        COMMON ERROR HALT
C1E1                           988 HLTE1    EQU   X'C1E1'        ENTER STARTING CYLINDER ADDRESS
C1E2                           989 HLTE2    EQU   X'C1E2'        SSW 1A-1B INVALID
C1E4                           990 HLTE4    EQU   X'C1E4'        SELECT DRIVE TO BE INITIALIZED
C1F1                           991 HLTF1    EQU   X'C1F1'        CAUTION HALT
                               992 *
                               993 *--------------------------------------------------------------------------------
                               994 *                    PROGRAM INDICATORS (IND)
                               995 *
0080                           996 UNITCK   EQU   X'80'          UNIT CHECK DETECTED
0040                           997 ERRHLT   EQU   X'40'          HALT ON ERROR CONDITION DETECTED
0020                           998 RSTEVN   EQU   X'20'          FLAG RESTORED EVEN
0010                           999 RSTODD   EQU   X'10'          FLAG RESTORED ODD
0008                          1000 STRT     EQU   X'08'          PRINT START MESSAGE
                              1001 *
                              1002 *--------------------------------------------------------------------------------
                              1003 *                    PROGRAM COMMUNICATION AREA (COM) INDICATORS
                              1004 *
0020                          1005 MPLFLG   EQU   X'20'          MICRO-PROGRAM LOADED
                              1006 *
                              1007 *--------------------------------------------------------------------------------
                              1008 *                    BIT POSITION SYMBOLS
                              1009 *
0080                          1010 BIT0     EQU   X'80'
0040                          1011 BIT1     EQU   X'40'
0020                          1012 BIT2     EQU   X'20'
0010                          1013 BIT3     EQU   X'10'
0008                          1014 BIT4     EQU   X'08'
0004                          1015 BIT5     EQU   X'04'
0002                          1016 BIT6     EQU   X'02'
0001                          1017 BIT7     EQU   X'01'
                              1018 *
                              1019 *--------------------------------------------------------------------------------
                              1020 *                    DCP SECTION REFERENCE TABLE
                              1021 *
020B                          1022 SBYTE3   EQU   X'020B'        SECTION SENSE SWITCHES  18-1F
020C                          1023 SBYTE4   EQU   X'020C'        SECTION SENSE SWITCHES  20-27
020D                          1024 SBYTE5   EQU   X'020D'        SECTION SENSE SWITCHES  28-2F
                              1025 *
0212                          1026 TEST     EQU   X'0212'        CHECK CE CONSOLE SWITCHES
021A                          1027 PRINT    EQU   X'021A'        PRINT A MESSAGE
021E                          1028 UNPACK   EQU   X'021E'        UNPACK DATA - HEX TO EBCDIC
0222                          1029 HALT     EQU   X'0222'        HALT AND DISPLAY HALT IDENTIFIER
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         022A 1031 LOAD     EQU   X'022A'          LOAD NEXT SECTION OR RECORD
                              1032 *
                         0232 1033 UTAB     EQU   X'0232'          DCP UDT TABLE
                              1034 *
                              1035 *---------------------------------------------------------------
                              1036 *
                              1037 *          OTHER REFERENCES EXTERNAL TO THIS SECTION
                         3C00 1038 LDR      EQU   X'3C00'          MICROCODE LOADER PROGRAM
                         8000 1039 DDDF     EQU   X'8000'          READ / WRITE BUFFER
                         80FF 1040 DDDFN    EQU   DDDF+255         END OF READ / WRITE BUFFER
                              1041 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1043          TREP
                              1044          TREP
                              1045          TREP
                              1046          TREP
                              1047          TREP
                              1048          TREP
                              1049          TREP
                              1050          TREP
                              1051          TREP
                              1052          TREP
                              1053          TREP
                              1054          TREP
                              1055          TREP
                              1056          TREP
                              1057          TREP
                              1058          TREP
                              1059          TREP
                              1060          TREP
                              1061          TREP
                              1062          TREP
                              1063          TREP
                              1064          TREP
                              1065          TREP
                              1066          TREP
                              1067          TREP
                              1068          TREP
                              1069          TREP
                              1070          TREP
                              1071          TREP
                              1072          TREP
                              1073          TREP
                              1074          TREP
                              1075          TREP
                              1076          TREP
                              1077          TREP
                              1078          TREP
                         FFFF 1079          END
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ACK	A	006	0ED4	0587	0550 0568
AMGPID	A	002	0A1E	0031	
ARR	C	001	0008	0973	0160 0371 0388 0411 0428 0445 0464 0485 0506 0534 0758
BEGIN	A	004	0B32	0160	0051 0085
BGNX	A	004	0C7D	0308	0160* 0162 0166*
BGNOA	A	004	0BF6	0249	
BGNOB	A	006	0C46	0281	0277
BGNOC	A	006	0C33	0276	0279
BGNOD	A	006	0C50	0284	0258
BGNOE	A	004	0C77	0305	0293
BGNOF	A	006	0C09	0255	0250 0282
BGNO1	A	004	0B55	0174	0169 0186 0215 0244
BGNO2	A	004	0B70	0188	0175
BGNO3	A	004	0B86	0197	0189
BGNO6	A	004	0B9C	0206	0198
BGNO7	A	006	0BB0	0220	0195 0204
BGNO8	A	003	0BC2	0226	0220* 0221*
BGNO9	A	006	0BEA	0246	0231
BIT0	C	001	0080	1011	0589 0610 0652 0678 0693 0725
BIT1	C	001	0040	1012	0230
BIT2	C	001	0020	1013	0326
BIT3	C	001	0010	1014	
BIT4	C	001	0008	1015	0616
BIT5	C	001	0004	1016	
BIT6	C	001	0002	1017	0096 0123
BIT7	C	001	0001	1018	0221 0391 0448 0545 0549 0567 0613
CC	A	002	141A	0950	
CCHAE	A	002	13FA	0921	
CCHAO	A	002	13FF	0926	
CCROE	A	002	1404	0931	
CCROO	A	002	140D	0939	
CEWR	A	002	1386	0891	0114 0141
COM	A	001	0A19	0027	0171 0772
CYL	A	002	13EE	0906	0278* 0281 0319 0339*
C1C	A	001	0000	0007	
C17	A	002	1079	0776	0760 0763
DCK	A	004	0F45	0637	0617
DDCF	A	001	1418	0948	0883
DDCR	A	002	137E	0883	0223 0450 0552
DDDF	C	001	8000	1039	0101 0128 0230 0249 0326 0391 0473* 0494* 0595* 0596 0596* 0598* 0600* 0601* 0613 0616 0642 0884 1040
DDDFN	C	001	80FF	1040	0517* 0518 0518*
DDDR	A	002	1380	0884	0224 0451 0553
DL	A	002	1420	0954	0471* 0492* 0514*
DLROE	A	002	140A	0935	
DLROO	A	002	1413	0943	
DRV	A	001	13F3	0911	0191* 0200* 0233 0284 0346
DRVADR	A	001	13F4	0912	0192* 0201* 0220 0447 0541 0543 0544
DSWS	A	002	1423	0957	0269* 0273
D1	A	001	1369	0871	0276 0710 0715 0728
EIGHT	A	004	136F	0874	0471 0492
ERRHLT	C	001	0040	0998	0590 0611 0619 0653 0679 0694 0730
FADID	A	002	0A20	0032	
FF	A	001	1418	0949	0096 0123
FFHAE	A	001	13F8	0920	
FFHAO	A	001	13FD	0925	
FFROE	A	001	1402	0930	
FFROO	A	001	140B	0938	
HAE	A	001	13FC	0919	
HALT	C	001	0222	1030	0183 0212 0241 0266 0305 0745
HAO	A	001	1401	0924	
HD	A	002	13F0	0907	0316 0329 0332* 0334 0337*
HH	A	002	141C	0951	0399* 0470* 0491* 0512*
HHHAE	A	002	13FC	0922	
HHHAO	A	002	1401	0927	
HHROE	A	002	1406	0932	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
HHROO	A	002	140F	0940	
HLTE1	C	001	C1E1	0989	0264 0267
HLTE2	C	001	C1E2	0990	0210 0213
HLTE4	C	001	C1E4	0991	0181 0184
HLTF1	C	001	C1F1	0992	0290 0306
HLT00	C	001	C100	0987	0770
HLT01	C	001	C101	0988	0239 0242 0740 0746
IND	A	001	13E8	0900	0054* 0088* 0119* 0146* 0148 0313 0325 0380 0390 0403 0420 0437 0457* 0477 0498 0522 0555* 0590* 0611* 0619* 0653* 0658 0661 0669* 0679* 0694* 0730
KL	A	001	141E	0953	
KLROE	A	001	1408	0934	
KLROO	A	001	1411	0942	
LDR	C	001	3C00	1038	0763 0778
LDRGO	A	004	107A	0778	0764
LDRID	A	002	0A1C	0030	0760
LDRLD	A	004	1063	0766	0761
LOAD	C	001	022A	1031	0359 0748 0774
MAXCYL	A	002	13EA	0902	0246* 0252*
MAXHD	A	002	13EC	0903	0247* 0253* 0329
MINT	A	014	134D	0854	0047 0048 0049
MPL	A	004	104D	0758	0172
MPLFLG	C	001	0020	1006	0171
MPLX	A	004	107E	0780	0758*
MREST	A	014	1358	0856	0081 0082 0083
MSG	A	001	1387	0896	0592* 0593* 0621* 0622* 0629* 0630* 0637* 0638* 0655* 0656* 0664* 0667* 0682* 0684* 0696* 0698* 0718*
MSGN	A	096	13E6	0897	0587 0587* 0608 0608* 0643 0650 0650* 0676 0676* 0691 0691* 0723
MSG01	A	001	1081	0789	0768
MSG01N	A	019	1094	0790	0768 0769
MSG02	A	001	1094	0792	0179
MSG02N	A	044	10DA	0794	0179 0180
MSG03	A	001	10DA	0796	0208
MSG03N	A	046	1108	0797	0208 0209
MSG04	A	001	1108	0799	0237
MSG04A	A	007	110F	0800	0233*
MSG04N	A	010	1119	0801	0237 0238
MSG05	A	001	1119	0803	0288
MSG05A	A	014	1127	0804	0047* 0081*
MSG05N	A	027	1142	0805	0284* 0288 0289
MSG06	A	001	1142	0807	0353
MSG06A	A	021	1157	0808	0043* 0082*
MSG06N	A	011	1162	0809	0346* 0353 0354
MSG07	A	001	1162	0811	
MSG07N	A	014	1170	0812	0593
MSG08	A	001	1170	0814	
MSG08N	A	014	117E	0815	0622
MSG09	A	001	117E	0817	
MSG09N	A	014	118C	0818	0630
MSG1A	A	001	12A6	0846	0302
MSG1AN	A	033	12EF	0848	0302 0303
MSG1B	A	001	12EF	0850	0262
MSG1BN	A	040	133F	0852	0262 0263
MSG10	A	001	118C	0820	
MSG10N	A	014	119A	0821	0638
MSG14	A	001	119A	0823	
MSG14N	A	018	11AC	0824	0684
MSG15	A	001	11AC	0826	
MSG15N	A	006	11D7	0828	0680* 0698 0728*
MSG16	A	001	11D7	0830	
MSG16B	A	008	11DF	0831	0703* 0710*
MSG16N	A	007	11E6	0832	0704* 0715* 0718
MSG17	A	001	11E6	0834	0738
MSG17A	A	014	11F4	0835	0049* 0083*
MSG17N	A	040	121C	0836	0738 0739
MSG18	A	001	121C	0838	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
MSG18A	A	046	124A	0839	0656
MSG18N	A	012	1256	0840	0664 0667
MSG19	A	001	1256	0842	0297
MSG19N	A	040	12A6	0844	0297 0298
NINTEN	A	002	1376	0878	0334
NN	A	001	1421	0955	0376* 0397* 0416* 0433* 0469* 0490* 0511* 0513*
NORM	A	006	0FB8	0691	0321
NSCAN	A	006	0CDD	0346	0327 0330
NULLS	A	001	1365	0867	0103 0130 0255 0316 0337 0376 0397 0416 0433 0469 0473 0490 0494 0511
NXTRC	A	004	0C81	0313	0068 0151
NXTRCX	A	004	0CD9	0341	0163* 0335
NXTRC1	A	004	0C4A	0325	0317 0731
NXT01	A	004	0C98	0320	0323
ONE	A	002	136B	0873	0278 0332 0339 0708 0713
PFC	A	002	0A07	0020	
PID	A	002	0A01	0016	
PRINT	C	001	021A	1028	0177 0206 0235 0260 0286 0295 0300 0348 0351 0720 0733 0736 0766
PRT	A	006	1008	0718	0714
PRTCYL	A	006	0FE2	0708	0711
PRTFLG	A	001	1012	0721	0589* 0610* 0652* 0678* 0693* 0725
PRTHD	A	006	0FF5	0713	0709 0716
PRTMSG	A	006	0FD0	0703	0645 0671 0686
PRTSNS	A	004	0F4F	0640	0603 0624 0632
PRT01	A	004	1023	0730	0726
P17	A	002	1374	0877	0253
P209	A	002	137A	0880	0246 0281
P286	A	002	137C	0881	0106 0133
P34	A	002	1378	0879	0252
P7	A	002	1372	0876	0247
Q	A	001	13F6	0916	0373* 0394* 0413* 0430* 0466* 0487* 0508* 0538
R	A	001	13F7	0917	0374* 0395* 0414* 0431* 0467* 0488* 0509* 0539
RDHAE	A	004	0D53	0411	0060 0094
RDHAEX	A	004	0D71	0423	0411*
RDHAO	A	004	0D75	0428	0063 0121
RDHAOX	A	004	0D93	0440	0428*
RDSNS	A	004	0D97	0445	0099 0126 0574
RDSNSX	A	004	0DB8	0459	0445*
RECAL	A	004	0CFD	0371	0056 0090 0392
RECALX	A	004	0D1B	0383	0371*
RR	A	001	141D	0952	0515*
RRROE	A	001	1407	0933	
RRROO	A	001	1410	0941	
RSTEVN	C	001	0020	0999	0119 0148 0658 0669
RSTMSG	A	006	0F5B	0650	0149
RSTODD	C	001	0010	1000	0146 0148 0658 0661 0669
RST01	A	006	0F8A	0667	0662
RST02	A	004	0F90	0669	0659 0665
RTN	A	001	0A03	0018	0292
RTN01	A	001	0A3A	0043	0020
RTN02	A	001	0A7A	0077	0045
R0E	A	001	140A	0929	
R0O	A	001	1413	0937	
R01	A	006	0A3E	0047	
R01A	A	004	0A50	0051	
R01B	A	004	0A5E	0058	0052
R02	A	006	0A7E	0081	
R02A	A	004	0A90	0085	
R02B	A	004	0A9E	0092	0086
R02E	A	004	0ADC	0117	0104 0107
R02F	A	004	0AE4	0121	0097 0110
R02G	A	004	0B1E	0144	0131 0134
R02H	A	004	0B26	0148	0124 0137
SBYTE3	C	001	0208	1023	0174 0188 0197 0356* 0742*
SBYTE4	C	001	020C	1024	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SBYTE5	C	001	020D	1025	0109 0136 0257 0357* 0743*
SCK	A	004	0F38	0629	0614
SEEK	A	004	0D1F	0388	0058 0092 0112 0139
SEEKX	A	004	0D4F	0406	0388*
SIO	A	003	0EA8	0559	0538* 0539* 0541*
SIOSNS	A	003	0DAD	0453	0447* 0448*
SKADR	A	001	13F0	0905	0255* 0399 0470 0491 0512 0706
SKDEVN	A	002	1415	0945	0101* 0103 0106
SKDODD	A	002	1417	0946	0128* 0130 0133
SNS	A	002	13F2	0909	0547* 0549 0565* 0567 0571 0598
SNS23	A	002	1384	0890	0599
SSW1A	C	001	0020	0978	0174 0197 0356 0742
SSW1B	C	001	0010	0979	0174 0188 0356 0742
SSW28	C	001	0080	0981	0257 0357 0743
SSW29	C	001	0040	0982	0109 0136 0357 0743
START	A	006	0F97	0676	0314
STRT	C	001	0008	1001	0054 0088 0313 0679
SVPFC	A	025	0A39	0034	0772*
SVPREQ	A	002	1382	0889	0115 0142
TEN	A	001	1370	0875	0322
TEST	C	001	0212	1027	0536
TIOBSY	A	004	0EAF	0563	0544* 0545*
TIORDY	A	004	0EA4	0557	0543*
UCK	A	006	0F0B	0608	0381 0404 0421 0438 0478 0499 0523
UCKMSK	A	001	13F5	0914	0193* 0202* 0570
UCK01	A	004	0F2B	0621	
UDTO	A	003	0A0C	0023	
UNITCK	C	001	0080	0997	0325 0380 0390 0403 0420 0437 0457 0477 0498 0522 0555
UNPACK	C	001	021E	1029	0271 0640
UTAB	C	001	0232	1033	0168
WORK	A	001	1424	0959	0706* 0708* 0713*
WORKN	A	004	1427	0960	0274 0276* 0319* 0320 0322*
WRCCD	A	004	0E24	0506	0066
WRCCDX	A	004	0E5E	0525	0506*
WRHAE	A	004	0DBC	0464	0061 0117
WRHAEX	A	004	0DEC	0480	0464*
WRHAO	A	004	0DF0	0485	0064 0144
WRHAOX	A	004	0E20	0501	0485*
XEQ	A	004	0E62	0534	0378 0401 0418 0435 0475 0496 0520
XEQX	A	004	0ED0	0576	0534* 0572
XEQ01	A	004	0ECC	0574	0557
XR1	C	001	0001	0971	0162* 0163 0165 0165* 0166
ZEROS	A	003	1368	0869	0680 0703 0704

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

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

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
°GBK°GBD°°°PN 51	32785°EC°571931°	3340°INITIALIZER	°°°°°°°°°MOD 12	84@@84@@°°°°°°°°	°°°°°°°°C1C00000
TC°Y<0*°°°&°BT,°	""@E&°°°°°°°°°°	°°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°°	°°°°°M8-C1C00001
T°°YR°°°°°°°°°°°	°°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°°	°°°°°;D̄%C1C00002
T+-Z4°&°H̄;-O(DK*	LL&O(DN*LL&O(D¬&	LL*BGB3HHPTYHD=T	°/03°OH*(G@BGCN(	°/06@OH*()*BGC¬C	°/08°91QC1C00003
T+-D̄?I<BGCHDB°("	"C°4JI1($C°4JN1(	$C°4J°A($OH*.<-D̄	;+--L:<BGC(7°/04	¬OH*(M3-BEAT2UC¬	°/04°1:&C1C00004
T+-,D̄VOOAEAO°E04	AEAMLR¬HDG°4AEAM	L¬(HBD3/°°-72UAL	°/04¬<*ML/TGED8.	°/06@+S°L:<BGCPM	8°/&°Q8&C1C00005
T+-%VF(HG(@BGCR*	<°J&P-A*(°J&PD6P	2AA0(°J&PD732°/<	8&°H(@Z°MOH*(G3G	ED8Q11J+BOH*(@CY	CD=-°;.%C1C00006
T+-_-+L°L:<B&C5?	°/02A(°-<-CMACH°	*°&3*°)HA°T&ACH°	*-°H3@YDH+B°HF*B	&DD49<°H.@Z°MOH*	BFUQ°NC8C1C00007
T+->$J/CEO;L°/OH	SO;L°/O_N+J°BB"H	&C331D"<@0A(4(H°	L'¬HGHTU-°-72U°@	@@/(3(<-L'C1°D"P	2/1&°OHOC1C00008
T+-?OOH*BFUQ>D&T	A8%BG°S.A8%BGB5M	<°°?CD"&:°&?C<*Q	L¬TGDD8C3°°¬AO-?	E+DB°°H̄&F-O°D&@	L@@°°KHYC1C00009
T+-OJ/OHE1/DJF*D	AOH*BH%DAOH*.N&O	AD=YL;-OAD=OL*TU	G-°.2U°O<°J(DD7-	<°J(%D7&<°1(OD6M	8-°H°:$8C1C00010
T+-1<C¬H̄&+%BG°/Z	EMA<"O;G°/OHSO;D	O°A&TOH*3G-HMHI&	XA2°MI1(Z@YHHC-D	L#/(;OH*<<04AD=8	L;%°°K$OC1C00011
T+-2G/°OIC°°J&/(	3OH*BFUMZDM.A@L4	AB-(2°JC°/OHE°N°	KZ%BG°/YEKJ.?OH*	BH%G1OH*°°C-HD=T	°D°@°=-QC1C00012
T+-3BVO4AD"°LR¬H	AF°OAEB*L#T4°EB¬	°-&=8CO°MI1(OO°H	<WCS°D=-8HH°A@/°	YC&<L@A(%@YD¬C-D	L@A<°PQ*C1C00013
T+-3'E04AD"°L)?H	DC°OAD"°LR&8AD=8	LE@BG°°°<°AESD"(	°/OHED%BG°/YFHAE	S+3°BB3?°°-7°/OH	D°C&°'90C1C00014
T+-488°4;(°°L'TO	AD"*<BJ&/D6P°/09	S+H°L:<°&CO?°/O°	°(°-(MTS°D=-8°Q°	°OA°<"LO°D"Q@°A(	7C°U°$YOC1C00015
T+-53EBDLR&OCEAO	L@<BGCWH8-A(YOA°	(B@BG°°°4B°54(°D	L'TOAD"*<BJ&/D6P	°/09S+H°L:<°&CO?	°/0°°=QHC1C00016
T+-6>°C&HCRQ@°J(	6(°UL'OOIEBDLR*B	GCWH8-A(YOA°(B@B	G°°°4B°6#C°°(,/(	4+-D(,TGFD7B11A+	°@0°°$1-C1C00017
T+-7ZA@GBC$°:-A(	YOH*°°C&HC;@@°/(	6(°DL'OOIEBDLR&O	CEAOL@°OBEB°L$OO	G-°*LR*BGCWH8-A(	YOA°°21OC1C00018
T+-8UCO?°/O°°(°-	+H30BD"Q@BJ(7C°U	MHJ(VC°<MGA(OC°H	MHA(7C°;°A1(VOH*	+QTS°D=T°D°@.OH*	°°C&°LC-C1C00019
T+-9¬B°9/(°HL'TO	HD"*<BJ&/D6M<°1&	*D"°@.1&/(°DMG3O	AEA4@°HC"C(:°"YC	"OH**QTS°D=T°D°@	.OH*°#.0C1C00020

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-:E°°°°4B°#LOH*	BD-O°CDUL'-O°CDY	L'O8°CDUL'°O°CDM	L'°O°C,°L'CYAC,°	01J(2+°DL@%°&C_&	11/<°NZHC1C00021
T+-#N¬TGDD8°#-A(	YO&°+3(<°°<GBCD?	A°°:?<<ML@T-AD"°.	°D°#HC°°+1/(5+&	L@¬H&A<BGCR¬°/O°	°CE@°P2UC1C00022
T+-@&D=QL93D°DAH	:&A(Y(EOL/00(D.M	J*CO°-A-<E8°P-A-	<°Q°AD"H111+D<<;	°°300-°¬2/4&<P1(	WD=*°¬18C1C00023
T+-'.+Y°&DT_°D=-	8°Q°°@/°Q+°S°°(H	&GTZ°D=-@PA+GC°4	LZJE=@Y*P(EOL/00	(D:MJT(HGBT1*D8+	<CJ< 7#QC1C00024
T+-=FZJFEOH*BG/S	°E1(W@Y)5CE@L9/(	X+8°&DT_°D=-@2J+	GCB4L1JIH+C°L:(H	&ET-&D=T2D°U<A/(	EDVQ°5&OC1C00025
T+-"A@Y*FC°%L1J1	O+3°L:(HG+&1¬D=Q	L93>°DAH#KA(YC°H	J51(Y(<UL/OOJD:U	J,(HGF°1¬D=QL93>	°DAH°JKHC1C00026
T+-"@+4°L:C3ID8*	<H/(BD)*<°/G¬D6-	<°JGWD6-<°1&XD"°	(°A&VD6?2--YFHAG	¬D6X°/O"SCODMI1(	,@YH°M1*C1C00027
T+-/°7B-Q&D;QLE*B	GC"H<C/+OD:$°/OH	E°W°L9TS°DA.2U°Q	FHAGPD6U8&A(YOI°	<D%BG°/DKOH=BF%Q	6D/O°P1UC1C00028
T+-/A2O&D#<°H.+@°	BC*BG°S.A°*BG°SY°	(°-&-&4AB/O&;¬H	AB&4A(°D&;¬HAE@B	G°/ZFD1BHO&°<F°Y	9B/-°8LUC1C00029
T+-B_OH*BH-&<E@B	G(.°/O°°4'$A1<X	N14CS1*(T2)$N&<(	1'=.E4@PC84CD6*X	V1HCT5UCB1HCU8%P	DK4°°2BBC1C00030
T+-/CY&+.N8UCS9>I	°@*E-@*I°8%PL1*(	T&<LR2;PE8UC1Q(I	°6*PS5@PC8@XV1)(	Y8_PS&+.W8UC1OOC	1OU°°*DHC1C00031
T+-/DT2)PVO)(1D_	°&($N4=/°5_PE&+.	H5>LL1DCB1HCO5M?	D6*XV1MCX&(PO84C	R1*GD:+¬X9=¬X9=¬	X9=*°6.4C1C00032
T+-/E;9=¬X94CT5UC	B1HCP1)XF5_XM1*J	°5_N°1(XI9*N°9@P	N1DCO1UCX9=¬X9=¬	X9=¬X9=¬X94CO5MC	D6*U°EJ@C1C00033
T+-/FR9*N°96A°O*L	A5=(E6MCC4UA-QDC	U5*XT&<(H1*(K&FA	-&+.E1)I°O@TEO'I°	°QFA°1<GTOMCC2<P	C4U°°*#4C1C00034
T+-/GMQFA°8>(A6;(	I5*)°O*LD6*PS8WA	°8'$TO)(°1)XR5_X	S&<$R5_J°8>(A6;(	I5*)°O*LD6*PS8UA°	&D°°R$DC1C00035
T+-/H(9=¬X&<(Y44C	X9=),&<TD&+¬X9=¬	X9=¬X9=¬X9=¬X9=)	°8@PR5<XNC;(E1DC	B1*(A9+.E&($F&(¬	R1*<°P,QC1C00036
T+-/IH1*PD2)PG&<P	R6)$RK6A°2<E°1_(	A14CB:+(E&(XE8>(	O6*PD&+(O&(C0&DA°	&DCE9*PN&<GN1DC	O1<&°I#°C1C00037
T+-/HE5%LD&DCO5)(	Y&DA°QFA°O@GU8@X	O5MA-QDCT2<XS&(X	O9+(I5*N°9%XL44C	P1)XF5_XM&<E°1<X	S4U°°"D<C1C00038
T+-/.°2)PI8@XA4@X	ZO:(I5_N,&<GN1DC	W2)(L&<LE8>(R5>/	°O)(L&<PX2;.T2)P	G&<(U8>(O5<PRE<L	A8@D°"9HC1C00039
T+-/.#&($N&+(H1MC	S1)(EO=(E1DCD6*X	V1M_°6*PS1;(°2<G	L84CT5UCC5_PT2)P	U1M?E5;(E6MCD1;.	I6*M°@,*C1C00040
T+-/<61DCS8@GR8@X	N14CC:((I5*LE6MC	A1<(R1;.S&<XN8'R°	O'¬U&<LA8@E°8>$	I8@(H1:I°2)N°1<P	C2)&°&Z&C1C00041
T+-/(10)(°L;¬CO@(	)2)PI8@XA4@XZO;(	I5_N°1_(A14CR1;.	T5_XE&°°°°°°°°°°	°°°CO@(C1°°D°°°°	HB-°°8T&C1C00042

OBJECT CARD LISTING

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

TEA+FAO J A< H-C  J J8MFH    | B&-  I...............  ................  ................  .....9R0C1C00043
T J|Y...........  ................  ................  ................  ................  .....7-YC1C00044
****************  ****************  ****************  ****************  ****************  ****....C1C00045
*...............  ................  ......3340 INITI  ALIZER..........  ................  ...*....C1C00046
****************  ****************  ****************  ****************  ****************  ****....C1C00047
*...............  ................  ................  ................  ................  ...*....C1C00048
* RTN 01  USED    TO INITIALIZE A   3340 DATA MODULE  ................  ................  ...*....C1C00049
*.........EACH    TRACK IS WRITTEN  IN COMPRESSED F   ORMAT WITH ALL Z  EROS............  ...*....C1C00050
*.........INITI   ALIZER STARTS WI  TH CYL 000, HEAD  00, AND INCREME   NTS SEQUENTIALLY  ...*....C1C00051
*.........EACH    HEAD AND EACH CY  LINDER. IF A STA  RTING CYLINDER O  THER THAN 000 IS  ...*....C1C00052
*.........DESIR   ED, TURN ON SENS  E SWITCH 28. ALT  ERNATE TRACKS AR  E NOT ASSIGNED.   ...*....C1C00053
*...............  ................  ................  ................  ................  ...*....C1C00054
* RTN 02  USED    TO RESTORE HOME   ADDRESS FLAGS, E  VEN AND ODD, IN   THE EVENT A.....  ...*....C1C00055
*.........HARDW   ARE FAILURE HAS   CAUSED TRACKS TO  BE ERRONEOUSLY    FLAGGED DEFECTIV  E.*.....C1C00056
*.........FLAGS   ARE RESTORED ON   THOSE TRACKS WH   OSE SKIP DISPLAC  EMENT VALUES ARE  ...*....C1C00057
*.........NOT B   ETWEEN HEX 0000   AND HEX 011E. IF  SENSE SWITCH 29   IS TURNED ON,...  ...*....C1C00058
*.........ALL F   LAGS ARE RESTORE  D...............  ................  ................  ...*....C1C00059
*...............  ................  ................  ................  ................  ...*....C1C00060
* SSW 28  IF SE   NSE SWITCH 28 IS  TURNED ON, ANY    VALID CYLINDER A  DDRESS CAN BE...  ...*....C1C00061
*.........ENTER   ED AS A STARTING  ADDRESS. ENTER    XCCC INTO THE CP  U CONSOLE.......  ...*....C1C00062
*.........SWITC   HES AT THE E1 HA  LT. CCC, CYLINDE  R ADDRESS, CAN B  E ANY  DECIMAL..  ...*....C1C00063
*.........NUMBE   R FROM 000 THROU  GH 209..........  ................  ................  ...*....C1C00064
```


OBJECT CARD LISTING

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

*...............  ................  ................  ................  ................  ...*....C1C00065
* SSW 29  IF SE   NSE SWITCH 29 IS  TURNED ON, THE    WRITE HOME ADDRE  SS PREREQUISITES  ...*....C1C00066
*.........ARE O   VERRIDDEN, AND A  FORCED WRITE HO   ME ADDRESS IS PE  RFORMED ON THOSE  ...*....C1C00067
*.........TRACK   S THAT ARE FLAGG  ED DEFECTIVE AND  WHOSE SKIP DISP   LACEMENT VALUES   ...*....C1C00068
*.........ARE B   ETWEEN HEX 0000   AND HEX 011E....  ................  ................  ...*....C1C00069
*...............  ................  ................  ................  ................  ...*....C1C00070
*...............  ................  *** CAUTION ***.  ................  ................  ...*....C1C00071
*...............  ................  ................  ................  ................  ...*....C1C00072
*.........1. TH   E INITIALIZER RO  UTINE WILL COMPL  ETELY REFORMAT A  N ENTIRE 3340...  ...*....C1C00073
*.............DA  TA MODULE.......  ................  ................  ................  ...*....C1C00074
*.........2. TH   E FLAG RESTORE R  OUTINE WILL REST  ORE TO 00 ALL FL  AGS THAT INDICAT  E.*.....C1C00075
*.............DE  FECTIVE TRACKS,   EVEN VALID DEFEC  TIVE FLAGS......  ................  ...*....C1C00076
*.........3. A    CUSTOMER PACK MU  ST BE RE-INITIAL  IZED USING THE S  INIT PROGRAM....  ...*....C1C00077
*.............AF  TER RUNNING EITH  ER OF THESE ROUT  INES............  ................  ...*....C1C00078
*...............  ................  ................  ................  ................  ...*....C1C00079
****************  ****************  ****************  ****************  ****************  ****....C1C00080
E""'*E7*=¬DC"PH$  ="7M&F|   |   C   F%  ASC   R A     S0-- Q..........  .....14180630750  806763#%C1C00081
```

LAST PAGE

FF21 SYSTEM TEST SUPERVISOR FOR MODEL 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                            2 *                                          LAST CHG:05:13:76
                            3         DECK  1
                            4         SEQ   0
   0A00                     5 FF2     START X'A00'
                            6         TREP
                            7 ********************************************************************
                            8 *                                                                  *
                            9 *       SYSTEM/3 SYSTEM TEST SUPERVISOR                            *
                           10 *                                                                  *
                           11 ********************************************************************
   0A00 FF21          0A01  12         DC    XL2'FF21'          PROGRAM IDENTIFICATION AND LEVEL
   0A02 80            0A02  13         DC    XL1'80'            FLAGS - NO SPUDT
   0A03 00            0A03  14         DC    IL1'0'             CURRENT ROUTINE NUMBER
   0A04 0000          0A05  15         DC    XL2'0'             RESERVED
   0A06 0AE9          0A07  16         DC    AL2(RTN01)         ADDRESS OF FIRST ROUTINE PREFIX
   0A08 0000          0A09  17         DC    XL2'0'             RESERVED
                           18
                           19 ********************************************************************
                           20 *                          TRANSFER TABLE                          *
                           21 ********************************************************************
                           22 *                                                                  *
                           23 *   THE SYSTEMS TEST SUPERVISOR PROVIDES THE FOLLOWING LINKAGE     *
                           24 *   FOR USE BY THE MODULES IT CONTROLS.  EACH MODULE MUST BE WRITTEN *
                           25 *   TO BRANCH TO THIS ENTRY WHENEVER THE DEVICE BEING TESTED IS BUSY *
                           26 *   OR NOT READY.                                                  *
                           27 ********************************************************************
   0A0A 35 10 0A1F         28 ENTRY  L     TR1,IAR                ENTRY TO PASS CONTROL TO NEXT MODULE
   0A0E 35 10 0A21         29 NOTME  L     TR2,IAR                ENTRY FROM MODULE NOT CAUSING INT.
   0A12 35 10 0A23         30 RESET  L     TR3,IAR      'ITS ME'  ENTRY FROM MODULE CAUSING OP END INT
   0A16 35 10 0A25         31 NEWJNT L     TR4,IAR                ENTRY TO OP END INT. RTN FROM MODULE
   0A1A 35 10 0A27         32        L     TR5,IAR          NOT USED
   0A1E 0B26          0A1F 33 TR1    DC    AL2(RENTRY)
   0A20 0C62          0A21 34 TR2    DC    AL2(RNOTME)
   0A22 0C6A          0A23 35 TR3    DC    AL2(RRESTR)
   0A24 0C0D          0A25 36 TR4    DC    AL2(RNXT)
   0A26 0A26          0A27 37 TR5    DC    AL2(*)     NOT USED
                      0A28 38
                      0A28 39 TABLE  EQU   *                      TABLE CONTAINING CATALOG OF PROGRAM
                      0AE8 40        DS    CL193                   MODULES IN CORE.  PROVISIONS ARE
                           41 *                                    MADE FOR SUPERVISION OF UP TO 16 *
                           42 *                                    MODULES.  INFORMATION IS CONTAINED*
                           43 *                                    AS IN THE FOLLOWING DIAGRAM.      *
                           44 *                                                                      *
                           45 ************************************************************      *
                           46 *  ARR   I  IAR  I  XR1  I  XR2  I  PSR  I STARTING I DEV ID IF *     *
                           47 *        I       I       I       I       I  ADDRESS I INT LEV 5 *     *
                           48 *  0-1   I  2-3  I  4-5  I  6-7  I   8   I   9-10   I    11     *     *
                           49 ************************************************************      *
                           50
                           51 ********************************************************************
                           52 *                  ROUTINE 01 - SYSTEMS TEST SUPERVISOR            *
                           53 ********************************************************************
                           54 *                                                                  *
                           55 *   THIS ROUTINE PROVIDES THE SUPERVISORY FUNCTION TO HANDLE THE    *
                           56 *   SIMULTANEOUS OPERATION OF UP TO 16 PROGRAM MODULES.  THE INDI-  *
                           57 *   VIDUAL MODULES ARE REFERENCED BY 11 BYTE ENTRIES IN -TABLE-.    *
                           58 *   LINKAGE FROM MODULE TO SUPERVISOR MUST TAKE PLACE EACH TIME THE *
                           59 *   DEVICE BEING TESTED IS BUSY OR NOT READY.  TRANSFER MUST BE MADE *
                           60 *   VIA A BRANCH TO LOCATION X'A0A'.  THE SUPERVISOR SAVES THE PRO- *
                           61 *   GRAM ARR, XR1 AND XR2, THEN PASSES CONTROL TO THE NEXT PROGRAM  *
                           62 *   BY BRANCHING VIA ITS PREVIOUSLY STORED ARR.                     *
                           63 ********************************************************************
   0AE9 01            0AE9 64 RTN01  DC    XL1'01'                 CURRENT ROUTINE NUMBER
   0AEA 00            0AEA 65        DC    XL1'0'                  FLAGS
   0AEB 0D8D          0AEC 66        DC    AL2(RTN02)              ADDRESS OF NEXT ROUTINE PREFIX
                           67 ********************************************************************
   0AED 3C 00 0CGA         68        MVI   MODKNT,0                ZERO COUNT OF MODULES WITH INT.
   0AF1 35 84 0C0C         69        L     OPEND,P5IAR             LOAD OP END INTERRUPT IAR
```


FF21 SYSTEM TEST SUPERVISOR FOR MODEL 15

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   0AF5 C2 01 0A28         70        LA    TABLE,XR1               SET UP TO RESTART ALL MODULES
   0AF9 7D FF 00           71 R1LOOP CLI   0(,XR1),X'FF'           TEST FOR LAST ENTRY
   0AFC F2 81 E2           72        JE    FIRST                   JUMP IF IT IS
   0AFF 75 02 0A           73        L     10(,XR1),XR2            LOAD MODULE'S ADDR. OF 1ST ROUTINE
   0B02 B8 40 02           74        TBN   2(,XR2),X'40'           TEST FOR OF END INT. FLAG
   0B05 F2 90 0A           75        JF    *+13                    JUMP IF NOT DEFINED
   0B08 6C 00 0B 00        76        MVC   11(1,XR1),0(,XR2)       MOVE ID FROM MODULE TO TABLE
   0B0C 0E 00 0C0A 0EA2    77        ALC   MODKNT(1),ONE           COUNT MODULES
   0B12 6C 01 01 07        78        MVC   1(2,XR1),7(,XR2)        SET ADDRESS OF 1ST ROUTINE
                           79 *                                    AS INITIAL ARR VALUE
   0B16 4E 01 01 0EA4      80        ALC   1(2,XR1),FOUR           BUMP PAST ROUTINE PREFIX
   0B1B 5C 01 03 01        81        MVC   3(2,XR1),1(,XR1)        SET IAR = ARR
   0B1F D2 01 0C           82        LA    12(,XR1),XR1            STEP POINTER TO NEXT ENTRY
   0B22 C0 87 0AF9         83        B     R1LOOP                  LOOP TILL ALL DONE
                           84 ********************************************************************
                           85 *       MODULE LINKAGE TO THIS SUPERVISCRY ROUTINE IS MADE AS FOLLOWS  *
                           86 *                                                                      *
                           87 *       B     ENTRY             WHERE     ENTRY  EQU   X'A0A'       *
                           88 ********************************************************************
   0B26 34 01 0EF4         89 RENTRY ST    SAVE1,XR1               SAVE XR1 TEMPORARILY
   0B2A 35 84 0C0C         90        L     OPEND,P5IAR             SET UP TO GO TO TOP OF OP END INT RTN
   0B2E 35 01 0EF8         91        L     POINTR,XR1              RELOAD TABLE POINTER
   0B32 74 08 01           92        ST    1(,XR1),ARR             PLACE RETURN ADDRESS IN TABLE SLOT
   0B35 4C 01 05 0EF4      93        MVC   5(2,XR1),SAVE1              MOVE MODULE'S XR1 FROM TEMP TO SAVE
   0B3A 74 02 07           94        ST    7(,XR1),XR2                 SAVE MODULE'S XR2
   0B3D 34 04 0EF4         95        ST    SAVE1,PSR                   SAVE MODULE'S PSR
   0B41 4C 00 08 0EF3      96        MVC   8(1,XR1),SAVE1-1            BITS 0-7
                           97
   0B46 30 00 0EF4         98 CKLOG  SNS   SAVE1,X'0'            CHECK DATA SWITCHES FOR LOGOUT
   0B4A 3D BB 0EF3         99        CLI   SAVE1-1,X'BB'             INSTRUCTIONS
   0B4E C0 81 0216        100        BE    LINK
   0D52 38 A0 0EF3        101        TBN   SAVE1-1,X'A0'           CONTINUE TEST IF NOT 'A' OR 'B'
   0B5. 39 40 0EF3        102        TBF   SAVE1-1,X'40'             IN DATA SWITCHES
   0B5A F2 90 4C          103        JF    CKDCP
   0B5D 08 01 0EF5 0EF3   104        MZN   WORK-1,SAVE1-1          ISOLATE ID OF MODULE TO BE ENABLED
   0B63 08 02 0EF5 0EF4   105        MNZ   WORK-1,SAVE1              OR DISABLED
   0B69 08 01 0EF6 0EF4   106        MZN   WORK,SAVE1
   0B6F C2 01 0A1C        107        LA    TABLE-12,XR1            GO THROUGH TABLE OF MODULES UNTIL
   0B73 D2 01 0C          108 FINDLP LA    12(,XR1),XR1              CORRECT ONE FOUND
   0B76 7D FF 00          109        CLI   0(,XR1),X'FF'
   0B79 F2 81 2D          110        JE    CKDCP
   0B7C 75 02 0A          111        L     10(,XR1),XR2            LOAD MODULE'S STARTING ADDR. IN XR2
   0B7F 28 03 0EF6 01     112        MNN   WORK,1(,XR2)
   0B84 2D 01 0EF6 01     113        CLC   WORK(2),1(,XR2)
   0B89 C0 01 0B73        114        BNE   FINDLP
                          115
   0B8D 38 10 0EF3        116        TBN   SAVE1-1,X'10'           'B' ENABLE ON ?
   0B91 F2 90 12          117        JF    TER
   0B94 7D FE 00          118        CLI   0(,XR1),X'FE'           THIS MODULE BEEN DISABLED ?
   0B97 F2 01 0F          119        JNE   CKDCP
   0B9A 6C 01 01 07       120        MVC   1(2,XR1),7(,XR2)        PUT ADDR. OF MODULE'S FIRST RTN IN
   0B9E 4E 01 01 0EA4     121        ALC   1(2,XR1),FOUR           BUMP PAST RTN. PREFACE
   0BA3 F2 87 03          122        J     CKDCP
                          123
   0BA6 7C FE 00          124 TER    MVI   0(,XR1),X'FE'           DISABLE MODULE CUZ ENTRY WAS 'A'
   0BA9 35 01 0EF8        125 CKDCP  L     POINTR,XR1              RELOAD TABLE POINTER
   0BAD 3D D0 0EF3        126        CLI   SAVE1-1,X'D0'           GO TO DCP IF POSSIBLE VALID ENTRY
   0BB1 C0 02 0212        127        BNL   TEST
                          128
                          129 *  BEGIN SEQUENCING THRU TABLE OF MODULES ENTERING THEM ONE AT A TIME
                          130 *
   0BB5 0C 01 0D8A 0D73   131        MVC   LASTME(2),ZEROS         ZERO COUNTER FOR RESETS TO 1 DEVICE
                          132 *                                  AND ID OF THAT DEVICE.
   0BBB 0C 00 0D86 0D73   133        MVC   IDSAVE(1),ZEROS         CLEAR PRESENT INT MODULE SAVE AREA
   0BC1 C0 87 0BC5        134        B     *+4
   0BC5 C0 87 0BC9        135        B     *+4
   0BC9 C0 87 0BCD        136        B     *+4
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   0BCD C0 87 0BD1              137         B     *+4
   0BD1 D2 01 0C                138 NEXT    LA    12(,XR1),XR1
   0BD4 7D FE 00                139 CKDSB   CLI   0(,XR1),X'FE'
   0BD7 C0 81 0BD1              140         BE    NEXT
   0BDB 7D FF 00                141         CLI   0(,XR1),X'FF'
   0BDE F2 01 0C                142         JNE   GOTO
   0BE1 C2 01 0A1C              143 FIRST   LA    TABLE-12,XR1
   0BE5 34 01 0EF8              144         ST    POINTR,XR1
   0BE9 C0 87 0B46              145         B     CKLOG
   0BED 1C 01 0C09 01           146 GOTO    MVC   RETURN+3(2),1(,XR1)
   0BF2 75 02 07                147         L     7(,XR1),XR2
   0BF5 34 01 0EF8              148         ST    POINTR,XR1
   0BF9 75 01 05                149         L     5(,XR1),XR1
   0BFC 3D C7 0200              150         CLI   MODEL,C'G'
   0C00 F2 81 03                151         JE    RETURN
   0C03 F4 40 02                152         CCP   X'02',X'40'
   0C06 C0 87 0000              153 RETURN  B     *-*
                                154
   0C0A 00                0C0A  155 MODKNT  DC    XL1'0'
```

INCREMENT POINTER TO NEXT TABLE SLOT
SKIP MODULE IF IT IS DISABLED

BRANCH IF NOT LAST ENTRY

RE-INITIALIZE TABLE POINTER IF THIS
WAS LAST ENTRY

LOAD RETURN ADDRESS WITH SAVED ARR
RESTORE XR2 FOR THIS PROGRAM
SAVE TABLE POINTER
RESTORE XR1 FOR THIS PROGRAM
IS THIS MODEL 12?
YES, SKIP NEXT INST.
SET CPU TO FAST BEFORE RETURN
GO TO NEXT MODULE

COUNTER FOR NUMBER OF MODULES


```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                157 *********
                                158 * OPEND *
                                159 ************************************************************
                                160 *
                                161 *           COME HERE TO SERVICE OP END INTERUPT WHETHER IT
                                162 *           OCCURS FROM SOME OTHER LEVEL OR IS SIMPLY NOT RESET
                                163 *           DUE TO ANY REASON ERROR OR NOT.
                                164 ************************************************************
                                165
   0C0B 0C0D                0C0C 166 OPEND   DC    AL2(**+2)          ADDRESS OF OP END INTERRUPT ROUTINE
                                167
                                168 *         SAVE REG'S OF MODULE RUNNING AT TIME OF INTERRUPT  ETC.
                                169 RNXT     EQU   *
                                170
   0C0D 34 01 0D6D              171         ST    TXR1,XR1           SAVE XR1
   0C11 34 02 0D6F              172         ST    TXR2,XR2           SAVE XR2
   0C15 34 04 0D71              173         ST    TPSR,PSR           SAVE PSR
   0C19 35 04 0D73              174         L     ZEROS,PSR          INITIALIZE PSR
   0C1D 0E 00 0D89 0EA2         175 FINDEM  ALC   ICTR(1),ONE        INCREMENT COUNTER OF RESETS
   0C23 3D 04 0D89              176         CLI   ICTR,4
   0C27 C0 81 0CA6              177         BE    NOBODY             IF NOBODY RESET IN 4 REQUESTS QUIT
   0C2B C0 87 0C2F              178         B     *+4
   0C2F C0 87 0C33              179         B     *+4
   0C33 C0 87 0C37              180         B     *+4
   0C37 C0 87 0C3B              181         B     *+4
                                182
                                182
                                182
                                182
                                182
   0C3B C2 01 0A1C              183         LA    TABLE-12,XR1       LOAD POINTER TO MODULE TABLE
                                184
   0C3F C2 01 0C                185 NXTMOD  LA    12(,XR1),XR1       BUMP TO NEXT ENTRY
   0C42 7D FF 00                186 INTR1   CLI   0(,XR1),X'FF'      TEST FOR END OF MODULE TABLE
   0C45 C0 81 0C1D              187         BE    FINDEM             NO ONE WILL ADMIT  TO THE INTERRUPT
   0C49 7D FF 0B                188         CLI   11(,XR1),X'FF'     TEST FOR NON INTERRUPT TYPE
   0C4C C0 81 0C3F              189         BE    NXTMOD             BRANCH IF NOT
                                190
   0C50 75 02 0A                191         L     10(,XR1),XR2       LOAD ADDRESS FROM TABLE THAT
                                192 *                                POINTS TO BEGINNING OF MODULE
   0C53 34 01 0D75              193         ST    TABLEA,XR1         SAVE TABLE POINTER
   0C57 2C 00 0D7F 00           194         MVC   TEMP(1),0(,XR2)    SAVE ID OF MODULE SO IF IT SAYS
                                195 *                                IT IS HIS INT, WE'LL KNOW HIS ID
   0C5C B5 02 05                196         L     5(,XR2),XR2        LOAD XR2 WITH ADDRESS OF INTERRUPT
                                197 *                                ROUTINE IN TEST MODULE
   0C5F E0 87 00                198         B     0(,XR2)            GO TO INTERRUPT ROUTINE IN MODULE
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              200 *********
                              201 * NOTME *
                              202 ***********************************************************
                              203 *
                              204 *            COME HERE FROM MODULE WHEN THAT MODULE SAYS THAT
                              205 *            THE INTERRUPT PENDING IS NOT HIS.
                              206 ***********************************************************
                              207
 0C62 35 01 0D75              208 RNOTME L     TABLEA,XR1            RESTORE TABLE POINTER
 0C66 C0 87 0C3F              209        B     NXTMOD                CONTINUE THROUGH TABLE TIL WE FIND
                              210 *                                  WHICH ONE CAUSED THE INTERRUPT.
                              211
                              212 ***********
                              213 * RESTOR  *
                              214 ***********************************************************
                              215 *
                              216 *            COME HERE FROM MODULE IN PREPARATION TO RESET
                              217 *            THE INTERRUPT.
                              218 *            THAT IS, RESTORE XR1,XR2,PSR.  THEN RETURN TO
                              219 *            THE MODULE AT THE ARR VALUE.
                              220 *
                              221 *
                              222 *
                              223 *
                              224 ***********************************************************
                              225
                      0C6A    226 RRESTR EQU   *
 0C6A 34 08 0CA5              227        ST    DORES+3,ARR           STORE LOCATION OF MODULE'S RESET RTN
 0C6E 0C 00 0D8A 0D88         228        MVC   LASTME(1),IDSAVE      PUT LAST ID IN LASTME
 0C74 0C 00 0D88 0D7F         229        MVC   IDSAVE(1),TEMP        SHOW THAT THIS MODULE RECOGIZED THE INT
 0C7A 0D 00 0D88 0D8A         230        CLC   IDSAVE(1),LASTME      IF LAST MODULE IS DIFFERENT THAN THIS
 0C80 C0 81 0C88              231        BE    SAME1                   ONE, ZERO THE COUNTER
 0C84 3C 00 0D89              232        MVI   ICTR,0
                      0C88    233 SAME1  EQU   *
 0C88 C0 87 0C8C              234        B     *+4
                              235
 0C8C 3D C7 0200              236        CLI   MODEL,C'G'        IS THIS MODEL 12?                    01
 0C90 F2 81 03                237        JE    ARND                 YES, SKIP NEXT INST.              01
 0C93 F4 40 02                238        CCP   X'02',X'40'      SET CPU TO FAST BEFORE RETURN          01
 0C96 35 01 0D6D              239 ARND   L     TXR1,XR1                                               01
 0C9A 35 02 0D6F              240        L     TXR2,XR2        RESTORE COMMON REGISTERS BEFORE ALLOWING
 0C9E 35 04 0D71              241        L     TPSR,PSR           THE RESET
 0CA2 C0 87 0000              242 DORES  B     *-*             GO DO RESET
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              244 **********
                              245 * NOBODY *
                              246 ***********************************************************
                              247 *       PRESENT INTERRUPT NOT RESET BY ANY MODULE.
                              248 *
                              249 ***********************************************************
                              250
                      0CA6    251 NOBODY EQU   *
                              252 *          FIND OUT IF DURING THE LAST 4 TIMES THROUGH LOOP CLAIMED
                              253 *          THAT THE INT WAS HIS
                              254
 0CA6 0D 00 0D88 0D8A         255        CLC   IDSAVE(1),LASTME
 0CAC C0 01 0CBC              256        BNE   UNEXP       IF NOT EQUAL THEN NO ONE CLAIMED AN INTERRUPT
                              257
                              258
 0CB0 3D 00 0D88              259        CLI   IDSAVE,0          IF 0, THEN SOMEBODY CAUSED AN INTERRUPT
                              260 *                              AND WE  CAN'T  FIGURE WHO IT IS
 0CB4 C0 81 0CBC              261        BE    UNEXP               ASSUME UNEXPECTED INT.
 0CB8 C0 87 0D23              262        B     FAIL              IF ^= 0 THEN THE ID = WHO EVER ADMITTED
                              263 *                                TO THE LAST 4 INTERRUPTS DIDN'T RESET
                              264 *                                SUCCESSFULLY
                              265 ***************************
                      0CBC    266 UNEXP  EQU   *                  ENTER HERE WHEN IDSAVE = 0
 0CBC C0 87 021E              267        B     UNPACK          UNPACK ID OF LAST MODULE WHO SHOULD
 0CC0 01              0CC0    268        DC    IL1'1'          HAVE RESET HIS INTERRUPT
 0CC1 0D8A            0CC2    269        DC    AL2(LASTME)      SOURCE
 0CC3 0D22            0CC4    270        DC    AL2(UNEXPM)      DESTINATION
 0CC5 C0 87 0CC9              271        B     *+4
 0CC9 C0 87 021A              272 PTIT   B     PRINT
 0CCD C6              0CCD    273        DC    XL1'C6'
 0CCE 4C              0CCE    274        DC    IL1'76'
 0CCF 0D22            0CD0    275        DC    AL2(UNEXPM)
 0CD1 FF00            0CD2    276        DC    XL2'FF00'
 0CD3 C0 87 0CC9              277        B     PTIT                48+28=76
 0CD7 C9D5E3C5D9D9D7E3 0D06   278        DC    CL48'INTERRPT NOT RESET, SOURCE OF INTERRUPT UNKNOWN,'
 0CDF 40D5D6E340D9C5E2        278
 0CE7 C5E36B40E2D6E4D9        278
 0CEF C3C540D6C640C9D5        278
 0CF7 E3C5D9D9E4D7E340        278
 0CFF E4D5D2D5D6E6D56B        278
 0D07 40D3C1E2E340D4D6 0D22   279 UNEXPM DC    CL28' LAST MODULE TO RESET WAS XX'
 0D0F C4E4D3C540E3D640        279
 0D17 D9C5E2C5E340E6C1        279
 0D1F E240E7E7                279
                              280
                              281 ***********************************************************
                              282 *
                              283 *            COME HERE IF OP END INTERRUPT NOT RESET BUT MODULE XX
                              284 *            SAYS HE HAS ONE PENDING BUT SEEMS UNABLE TO RESET IT.
                              285 *            THAT IS, WHEN COUNT IN 'LASTME' IS 4.
                              286 ***********************************************************
                              287
 0D23 C0 87 021E              288 FAIL   B     UNPACK              TO UNPACK THE PASSED ID
 0D27 01              0D27    289        DC    XL1'1'              LENGTH
 0D28 0D8A            0D29    290        DC    AL2(LASTME)         SOURCE ADDRESS
 0D2A 0D4E            0D2B    291        DC    AL2(IDFLD)          DESTINATION
 0D2C C0 87 0D30              292        B     *+4
                              293
 0D30 C0 87 021A              294 CANTR  B     PRINT               TO PRINT ERROR MSG THAT INT NOT RES.
 0D34 C6              0D34    295        DC    XL1'C6'             FLAGS
 0D35 2A              0D35    296        DC    IL1'42'             LENGTH
 0D36 0D67            0D37    297        DC    AL2(NOREST)         MESSAGE ADDRESS
 0D38 FF00            0D39    298        DC    XL2'FF00'           MESSAGE ID
 0D3A C0 87 0D30              299        B     CANTR               LOOP TO INDICATE ERROR
 0D3E D4D6C4E4D3C540E6 0D4E   300 IDFLD  DC    CL17'MODULE WITH ID XX'
 0D46 C9E3C840C9C440E7        300
 0D4E E7                      300
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0D4F 40C4C9C440D5D6E3 0D67  301 NOREST DC    CL25' DID NOT RESET INTERRUPT'
   0D57 40D9C5E2C5E340C9       301
   0D5F D5E3C5D9D9E4D7E3       301
   0D67 40                     301
                               302
                               302
   0D68 0000             0D69  303 TARR   DC    XL2'0'
   0D6A 0000             0D6B  304 TIAR   DC    XL2'0'
   0D6C 0000             0D6D  305 TXR1   DC    XL2'0'
   0D6E 0000             0D6F  306 TXR2   DC    XL2'0'
   0D70 0000             0D71  307 TPSR   DC    XL2'0'
   0D72 0000             0D73  308 ZEROS  DC    XL2'0'
   0D74 0000             0D75  309 TABLEA DC    XL2'0'
   0D76 0000             0D77  310 STATUS DC    XL2'0'
   0D78 0100             0D79  311 MASK1  DC    XL2'0100'
   0D7A 0000             0D7B  312 MASK2  DC    XL2'0000'
   0D7C 6F6F             0D7D  313 UNKWN  DC    CL2'??'
   0D7E 0000             0D7F  314 TEMP   DC    XL2'0'
   0D80 0000             0D81  315 RESADD DC    XL2'00'
   0D82 FFFF             0D83  316 NEG1   DC    XL2'FFFF'
   0D84 00               0D84  317 INTFLG DC    XL1'0'
   0D85 0C6A             0D86  318 OPENDX DC    AL2(RRESTR)
   0D87 00               0D87  319 INTKNT DC    XL1'0'          COUNTER FOR NUMBER OF INTERRUPTS
   0D88 00               0D88  320 IDSAVE DC    XL1'0'
                         0D89  321 ICTR   EQU   *
   0D89 0000             0D8A  322 LASTME DC    XL2'0'          RIGHT BYTE-- ID OF MODULE WHICH
                               323 *                            LAST ADMITTED THAT HE CAUSED AN OP END
                               324 *                            INT.  LEFT BYTE--  NUMBER OF TIMES THAT
                               325 *                            THAT MODULE WAS ENTERED TO RESET HIS INT
   0D8B 0100             0D8C  326 X100   DC    XL2'0100'
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               328 ********************************************************************
                               329 *                          ROUTINE 2 - LOGOUT                      *
                               330 ********************************************************************
                               331 *                                                                  *
                               332 *   THIS ROUTINE LOGS THE ERROR RECORDING TABLE FROM EACH MODULE.   *
                               333 *   LOGOUT OCCURS ONLY UPON DATA SWITCH SELECTION OF THIS ROUTINE.  *
                               334 *   RECORDING TABLE ENTRIES HAVE THE FOLLOWING FORMAT              *
                               335 *                                                                  *
                               336 *     ***************************************************          *
                               337 *     *  CODE  * LENGTH *  N BYTES OF FORMAT SPECIFIED  *          *
                               338 *     *  BYTE  *  -N-   *  BY THE CODE BYTE            *          *
                               339 *     ***************************************************          *
                               340 *        *                                                         *
                               341 *        *                                                         *
                               342 *        *                                                         *
                               343 *     BIT 0 - PRINTABLE DATA - PRINT AS IS.                        *
                               344 *         1 - PACKED HEX DATA - UNPACK BEFORE PRINTING.            *
                               345 *                                                                  *
                               346 *   A CODE BYTE OF X'FF' TERMINATES LOGOUT.                        *
                               347 ********************************************************************
   0D8D 02               0D8D  348 RTN02  DC    XL1'02'         CURRENT ROUTINE NUMBER
   0D8E 00               0D8E  349        DC    XL1'0'          FLAGS
   0D8F FFFF             0D90  350        DC    XL2'FFFF'       LAST ROUTINE PREFIX
                               351 ********************************************************************
   0D91 C0 87 021A             352        B     PRINT           SPACE PRINTER
   0D95 13               0D95  353        DC    XL1'13'
   0D96 3C 5C 08DA             354        MVI   PLINE+90,C'*'   PRINT A LINE OF ASTERISKS AS A
   0D9A 0C 59 08D9 08DA        355        MVC   PLINE+89(90),PLINE+90  SEPARATION
   0DA0 C0 87 021A             356        B     PRINT
   0DA4 22               0DA4  357        DC    XL1'22'
   0DA5 C2 01 0A28             358        LA    TABLE,XR1       POINT XR1 AT TABLE OF MODULES
   0DA9 7D FF 00               359 CKMOD  CLI   0(,XR1),X'FF'   BRANCH IF LAST ENTRY
   0DAC F2 81 CF               360        JE    LOGEND
   0DAF 75 02 0A               361        L     10(,XR1),XR2    LOAD POINTER TO MODULE SPT
   0DB2 BD FF 08               362        CLI   8(,XR2),X'FF'   BRANCH IF NO RECORDING TABLE
   0DB5 F2 81 BF               363        JE    NXMOD1
   0DB8 B5 02 09               364        L     9(,XR2),XR2     LOAD ADDRESS OF TABLE INTO XR2
   0DBB B9 3F 00               365 LOOP5  TBF   0(,XR2),B'00111111'  IF INVALID BITS - TERMINATE LOGOUT
   0DBE F2 90 A2               366        JF    NXMOD           OF THIS MODULE
                               367 *                            IF X'FF' CODE BYTE - MODULE DONE
   0DC1 2C 00 0EAA 01          368        MVC   ADR(1),1(,XR2)
   0DC6 3C 00 0EA9             369        MVI   ADR-1,X'0'
   0DCA 2C 00 0E55 01          370        MVC   PLEN(1),1(,XR2)   MOVE LENGTH OF FIELD TO PRINT LINK
   0DCF 34 02 0E57             371        ST    PADR,XR2          SET UP ADDRESS PARAMETER
   0DD3 C0 87 0E00             372        B     X'E00'          BRANCH ABSOLUTE DC'S
                               373
   FFDA                        374        ORG   X'FFFF'-X'0DFC'+*   IF FLAGGED, YOU HAVE ORG OVERLAP
   0DFC                        375        ORG   X'0DFC'
   0DFC 0000             0DFD  376 BSCAX  DC    XL2'0000'       DC'S USED FOR BSCA 80F  AND  88F.
   0DFE 0000             0DFF  377 BSCAY  DC    XL2'0000'       MUST BE AT 0DFC-0DFF.
                         0E00  378 XE00   EQU   *   THIS IS E00
   0E00 0E 01 0E57 0EA2        379        ALC   PADR(2),ONE
   0E06 0E 01 0E57 0EAA        380        ALC   PADR(2),ADR
   0E0C 0C 01 0E45 0E57        381        MVC   UADR1(2),PADR     SET UP UNPACK SOURCE ADDR
   0E12 B8 80 00               382        TBN   0(,XR2),X'80'     GO PRINT IF THIS IS PRINTABLE ENTRY
   0E15 F2 10 38               383        JT    PRTENT
   0E18 B8 40 00               384        TBN   0(,XR2),X'40'     IF NOT HEX DATA, MUST BE CODE ERROR
   0E1B F2 90 45               385        JF    NXMOD             TERMINATE LOGOUT OF THIS MODULE
   0E1E 2C 00 0E43 01          386        MVC   ULEN(1),1(,XR2)   SET UP PARAMETERS TO UNPACK HEX DATA
   0E23 0C 01 0E47 0EA8        387        MVC   UADR2(2),X881
   0E29 0E 00 0EAA 0EAA        388        ALC   ADR(1),ADR
   0E2F 0E 01 0E47 0EAA        389        ALC   UADR2(2),ADR
   0E35 3C 40 08FF             390        MVI   PLINE+127,C' '    CLEAR DCP PRINT AREA
   0E39 0C 83 08FE 08FF        391        MVC   PLINE+126(132),PLINE+127
   0E3F C0 87 021E             392        B     UNPACK            UNPACK HEX DATA
   0E43 00               0E43  393 ULEN   DC    IL1'0'
   0E44 0000             0E45  394 UADR1  DC    AL2(*-*)
   0E46 0000             0E47  395 UADR2  DC    AL2(*-*)
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E48 C0 87 021A              396          B     PRINT                    PRINT OUT HEX DATA
   0E4C 21                0E4C  397          DC    XL1'21'
   0E4D F2 87 08                398          J     NXCODE                   GO CHECK NEXT CODE BYTE
   0E50 C0 87 021A              399 PRTENT   B     PRINT                    PRINT OUT THIS ENTRY
   0E54 01                0E54  400          DC    XL1'01'
   0E55 00                0E55  401 PLEN     DC    IL1'0'
   0E56 0000              0E57  402 PADR     DC    AL2(*-*)
   0E58 35 02 0E45              403 NXCODE   L     UADR1,XR2                MODIFY XR2 TO POINT AT NEXT
   0E5C E2 02 01                404          LA    1(,XR2),XR2               CODE BYTE
   0E5F C0 87 0DBB              405          B     LOOP5                    GO CHECK THIS ENTRY
   0E63 C0 87 021A              406 NXMOD    B     PRINT
   0E67 11                0E67  407          DC    XL1'11'
   0E68 3C 60 08DA              408          MVI   PLINE+90,C'-'            PRINT LINE OF DASHES TO SEPARATE
   0E6C 0C 59 08D9 08DA         409          MVC   PLINE+89(90),PLINE+90     MODULES
   0E72 C0 87 021A              410          B     PRINT
   0E76 22                0E76  411          DC    XL1'22'
   0E77 D2 01 0C                412 NXMOD1   LA    12(,XR1),XR1             INCREMENT TO NEXT MODULE
   0E7A C0 87 0DA9              413          B     CKMOD                    GO PRINT LOGOUT OF NEXT MODULE
   0E7E C0 87 021A              414 LOGEND   B     PRINT                    PRINT ENDING MSG AND INSTRUCTIONS
   0E82 42                0E82  415          DC    XL1'42'
   0E83 48                0E83  416          DC    IL1'72'
   0E84 0EF2              0E85  417          DC    AL2(ENDMSG)
   0E86 FFE1              0E87  418          DC    XL2'FFE1'
   0E88 3C 5C 08DA              419          MVI   PLINE+90,C'*'            PRINT A LINE OF ASTERISKS
   0E8C 0C 59 08D9 08DA         420          MVC   PLINE+89(90),PLINE+90
   0E92 C0 87 021A              421          B     PRINT
   0E96 26                0E96  422          DC    XL1'26'
   0E97 C0 87 0222              423          B     HALT
   0E9B FFE1              0E9C  424          DC    XL2'FFE1'                HALT TO ALLOW INTERVENTION
   0E9D C0 87 0000              425          B     0                        GO RESTART PROGRAM
                                426
                                427 *************
                                428 * CONSTANTS ***************************************************************
                                429 *************
   0EA1 0001              0EA2  430 ONE      DC    IL2'1'
   0EA3 0004              0EA4  431 FOUR     DC    IL2'4'
   0EA5 0005              0EA6  432 FIVE     DC    IL2'5'
   0EA7 0881              0EA8  433 X881     DC    XL2'881'
   0EA9 0000              0EAA  434 ADR      DC    XL2'0'
                                435
                                436 *************
                                437 * PRINTOUTS ***************************************************************
                                438 *************
   0EAB D3D6C7D6E4E340C3 0EDD   439          DC    CL51'LOGOUT COMPLETE - REMOVE -BB- FROM LEFT 2 SWS THEN '
   0EB3 D6D4D7D3C5E3C540        439
   0EBB 6040D9C5D4D6E5C5        439
   0EC3 4060C2C26040C6D9        439
   0ECB D6D440D3C5C6E340        439
   0ED3 F240E2E6E240E3C8        439
   0EDB C5D540                  439
   0EDE D9C5E2C5E340C8C1 0EF2   440 ENDMSG  DC    CL21'RESET HALT TO RESTART'
   0EE6 D3E340E3D640D9C5        440
   0EEE E2E3C1D9E3              440
                                441
                                442 *******************
                                443 * RESERVED STORAGE *********************************************************
                                444 *******************
   0EF3                 0EF4    445 SAVE1  DS    CL2                      TEMPORARY SAVE AREA FOR XR1
   0EF5                 0EF6    446 WORK   DS    CL2
   0EF7                 0EF8    447 POINTR DS    CL2                      TABLE POINTER FOR NEXT MODULE
   0EF9                 0EFA    448 TEMP1  DS    CL2
                                449
                                450 ************
                                451 * EQUATES *****************************************************************
                                452 ************
                          0001  453 XR1      EQU   1                        INDEX REGISTER 1
                          0002  454 XR2      EQU   2                        INDEX REGISTER 2
                          0004  455 PSR      EQU   X'04'                    PROGRAM STATUS REGISTER
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         0008  456 ARR      EQU   X'08'
                         0010  457 IAR      EQU   X'10'
                         0084  458 IAR5     EQU   X'84'
                         0020  459 PIAR     EQU   X'20'
                         0040  460 PARR     EQU   X'40'
                         0088  461 P4IAR    EQU   X'88'
                         0084  462 P5IAR    EQU   X'84'
                         0010  463 PLMR     EQU   X'10'
                         0200  464 MODEL    EQU   X'200'
                         0212  465 TEST     EQU   X'212'
                         0216  466 LINK     EQU   X'216'
                         021A  467 PRINT    EQU   X'21A'
                         021E  468 UNPACK   EQU   X'21E'
                         0222  469 HALT     EQU   X'222'
                         0880  470 PLINE    EQU   X'880'
                               471          TREP
                               472          TREP
                               473          TREP
                               474          TREP
                               475          TREP
                         FFFF  476          END
```

ADDRESS RECALL REGISTER
INSTRUCTION ADDRESS REGISTER

PROGRAM LEVEL IAR
PROGRAM LEVEL ARR
INTERRUPT LEVEL 4 IAR
INTERRUPT LEVEL 5 IAR

SYSTEM MODEL TYPE AREA 01
SRT -ENTRY TO CHECK CONSOLE SWITCHES
SRT -ENTRY TO CHAIN ROUTINE
SRT -ENTRY TO PRINT
SRT -ENTRY TO CONVERT HEX TO EBCDIC
SRT -ENTRY TO HALT
START OF DCP PRINT LINE

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ADR	A	002	0EAA	0434	0368* 0369* 0380 0388 0388* 0389
ARND	A	004	0C96	0239	0237
ARR	C	001	0008	0456	0092 0227
BSCAX	A	002	0DFD	0376	
BSCAY	A	002	0DFF	0377	
CANTR	A	004	0D30	0294	0299
CKDCP	A	004	0BA9	0125	0103 0110 0119 0122
CKDSB	A	003	0BD4	0139	
CKLOG	A	004	0B46	0098	0145
CKMOD	A	003	0DA9	0359	0413
DCRES	A	004	0CA2	0242	0227*
ENDMSG	A	021	0EF2	0440	0417
ENTRY	A	004	0A0A	0028	
FAIL	A	004	0D23	0288	0261
FF2	A	001	0A00	0005	
FINDEM	A	006	0C1D	0175	0187
FINDLP	A	003	0B73	0108	0114
FIRST	A	004	0BE1	0143	0072
FIVE	A	002	0EA6	0432	
FOUR	A	002	0EA4	0431	0080 0121
GOTO	A	005	0BED	0146	0142
HALT	C	001	0222	0469	0423
IAR	C	001	0010	0457	0028* 0029* 0030* 0031* 0032*
IAR5	C	001	0084	0458	
ICTR	A	001	0D89	0321	0175* 0176 0232*
IDFLD	A	017	0D4E	0300	0291
IDSAVE	A	001	0D88	0320	0133* 0228 0229* 0230 0255 0258
INTFLG	A	001	0D84	0317	
INTKNT	A	001	0D87	0319	
INTR1	A	003	0C42	0166	
LASTME	A	002	0D8A	0322	0131* 0228* 0230 0255 0269 0290
LINK	C	001	0216	0466	0100
LOGEND	A	004	0E7E	0414	0360
LOOP5	A	003	0DBB	0365	0405
MASK1	A	002	0D79	0311	
MASK2	A	002	0D7B	0312	
MODEL	C	001	0200	0464	0150 0236
MODKNT	A	001	0C0A	0155	0068* 0077*
NEG1	A	002	0D83	0316	
NEWINT	A	004	0A16	0031	
NEXT	A	003	0BD1	0138	0140
NOBODY	A	001	0CA6	0251	0177
NOREST	A	025	0D67	0301	0297
NOTME	A	004	0A0E	0029	
NXCODE	A	004	0E58	0403	0398
NXMOD	A	004	0E63	0406	0366 0385
NXMOD1	A	003	0E77	0412	0363
NXTMOD	A	003	0C3F	0185	0189 0209
ONE	A	002	0EA2	0430	0077 0175 0379
OPEND	A	002	0C0C	0166	0069 0090
OPENDX	A	002	0D86	0318	
PADR	A	002	0E57	0402	0371* 0379* 0380* 0381
PARR	C	001	0040	0460	
PIAR	C	001	0020	0459	
PLEN	A	001	0E55	0401	0370*
PLINE	C	001	0880	0470	0354* 0355 0355* 0390* 0391 0391* 0408* 0409 0409* 0419* 0420 0420*
PLMR	C	001	0010	0463	
POINTR	A	002	0EF8	0447	0091 0125 0144* 0148*
PRINT	C	001	021A	0467	0272 0294 0352 0356 0396 0399 0406 0410 0414 0421
PRTENT	A	004	0E50	0399	0383
PSR	C	001	0004	0455	0095 0173 0174* 0241*
PTIT	A	004	0CC9	0272	0277
P4IAR	C	001	0088	0461	
P5IAR	C	001	0084	0462	0069* 0090*
RENTRY	A	004	0B26	0089	0033
RESADD	A	002	0D81	0315	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RESET	A	004	0A12	0030	
RETURN	A	004	0C06	0153	0146* 0151
RNOTME	A	004	0C62	0208	0034
RNXT	A	001	0C0D	0169	0036
RRESTR	A	001	0C6A	0226	0035 0318
RTN01	A	001	0AE9	0064	0016
RTN02	A	001	0D8D	0348	0066
R1LOOP	A	003	0AF9	0071	0083
SAME1	A	001	0C88	0233	0231
SAVE1	A	002	0EF4	0445	0089* 0093 0095* 0096 0098* 0099 0101 0102 0104 0105 0106 0116 0126
STATUS	A	002	0D77	0310	
TABLE	A	001	0A28	0039	0070 0107 0143 0183 0358
TABLEA	A	002	0D75	0309	0193* 0208
TARR	A	002	0D69	0303	
TEMP	A	002	0D7F	0314	0194* 0229
TEMP1	A	002	0EFA	0448	
TER	A	003	0BA6	0124	0117
TEST	C	001	0212	0465	0127
TIAR	A	002	0D6B	0304	
TPSR	A	002	0D71	0307	0173* 0241
TR1	A	002	0A1F	0033	0028
TR2	A	002	0A21	0034	0029
TR3	A	002	0A23	0035	0030
TR4	A	002	0A25	0036	0031
TR5	A	002	0A27	0037	0032
TXR1	A	002	0D6D	0305	0171* 0239
TXR2	A	002	0D6F	0306	0172* 0240
UADR1	A	002	0E45	0394	0381* 0403
UADR2	A	002	0E47	0395	0387* 0389*
ULEN		001	0E43	0393	0386*
UNEXP	A	001	0CBC	0266	0256 0260
UNEXPM	A	028	0D22	0279	0270 0275
UNKWN	A	002	0D7D	0313	
UNPACK	C	001	021E	0468	0267 0288 0392
WORK	A	002	0EF6	0446	0104* 0105* 0106* 0112* 0113
XE00	A	001	0E00	0378	
XR1	C	001	0001	0453	0070* 0071 0073 0076 0078 0080 0081 0081 0082 0082* 0089 0091* 0092 0093 0094 0096 0107* 0108 0108* 0109 0111 0118 0120 0121 0124 0125* 0138 0138* 0139 0141 0143* 0144 0146 0147 0148 0149 0149* 0171 0183* 0185 0185* 0186 0188 0191 0193 0208* 0239* 0358* 0359 0361 0412 0412*
XR2	C	001	0002	0454	0073* 0074 0076 0078 0094 0111* 0112 0113 0120 0147* 0172 0191* 0194 0196 0196* 0198 0240* 0361* 0362 0364 0364* 0365 0368 0370 0371 0382 0384 0386 0403* 0404 0404*
X100	A	002	0D8C	0326	
X881	A	002	0EA8	0433	0387
ZEROS	A	002	0D73	0308	0131 0133 0174

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

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

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
°GBK°GBD°°°PN°55	55573°EC°830234°	SYSTEM°TEST°SUPE	RVISOR°°°°MOD°15	84@@84@@°°°°°°°°	°°°°°°°°FF210000
TIOYX"2F°°°°°B>U	°°CM&B/@5D°Y/(J°	H̄H3M&BSM5D°YX&2Q	<Q-1D̄C°4H̄I-°°°°°	°°°°°°B*VH2D¬GJU	ND&4G32%FF210001
T<O%*°&°(TLO°C°Y	5/°O<O-DH̄H̄G7"°|H̄	A6XMBB,/°°?H̄&BWO	°BO°+°°OH̄CD̄I%°&D	GL-DACD̄J*°&°1H̄BQ	|BO*CĒT4FF210002
T<&_+°OGK°&3°/O,	9(°D+'CODC°05°&#	8)°-AL°DEC?J4°-*	4A°#4L°°HC?<O°°#	4|$%+@@°°<BOYH1O	MD°OHNA*FF210003
T<&>°-&HO+H̄°+@3V	°C?|2UDOH°&#5C?<	H°-#5C?&H°&#6C?L	B°&Y*4-D<¬¬@°@YD	_)&HH̄H̄°<°H1@)FJ*	LD&YF1A<FF210004
T<O>4C?QA.&D+'-G	°°&_3+A°+@"H̄&DX7	=°|HAC60A°&)+°&D	+Z|H̄G°73=°CMAC?-	'4°#30°HBD-°?H2D	|BOQAO#YFF210005
T<°?VC°D(S-53C°°	(S°53OH*.1*BGB@X	°/O?(OH*.4)HACG7	=°<BAB'E'"OC2°&3	B°&Y*(°°?IJ%PDO@	.B&MC¬ĒHFF210006
T<-OQ°&#8OH*.J/O	AC°UA)&HG(°D+=GM	AAL7G°-C2-&|4&°.	°/O°°°°O((°D($L&	BCO@4A°51°CH>H̄SQ	KB-QB5$HFF210007
T.01H(&&(*08°CQU	+YT4DCQX°-&2WOH*	<.@BGCC|°/OO7OH*	<+@HAB/3K°&1'"OC	°-&O)°B@VHJ4REJD	(B&*CP1°FF210008
T<°19¬¬@.OHD<|7M	BBT&ACPM%°°5"°.M	BA;BG°CMACPP°/OO	"(°-<Z&O°CQY(S°O	°CQ-(¬O°O.SYYIB°	*D&4F;JHFF210009
T.02ZC&°(S°6H̄OHD	<SCO°CQX°/O2<|**	B°|H̄A°"J°°TMACO4	5°-5?(&&(**BG°°°	(°°6H°°°°.2*TG1D	(B&MC92DFF210010
T<°3ĒCQ,°°&2@|&°	(S<BAC.3°/O4TOH*	BG-D(S-4SOH*<2*B	G°/,FL°4S"OC°/O3	I2)PT1&°%I/8ĒFAD	(B&MAQD̄@FF210011
T+-4N6)XP84CN5>(	°6*PS1;(,&+.O9(X	C1MCO1UCI5;|E6)X	U5=(°9(PK5)$W5Q_	°4@GS84CM5%LU4@N	°8'Q°3ĒDFF210012
T(&5.&(XE8%PT&+$	A8UCX9@BG°/8ACQY	(L%BGCLC°/OHĒ1SY	(R"@°OH*(<(LO1+L	L1MCW2;|H&<XD°B*	/FJML1H̄@FF210013
T+°6D&+¬X&<LI1DC	N5>(°6*PS1;(°2)P	T1)XR9(¬T&°°°°°°	°°°°°°°°°°°°°°°	A°°°°$6@°°°°°""@	°°°°°¬$DFF210014
T+°6'CFY°°°°°°&	B°|""OH*BF/<@P°T	ĒCEUH6&TĒOH*BFS.	B°&YY¬¬@°@YG|)&H	H?¬@H@YF"_&H!>L@	°°8<A"B-FF210015
TF°7O@ZBS.°°+D̄-D	@°°:Z.°°+N&D4°-9	POH*+°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	MCO%F2L%FF210016
T<°8%°°°°°°8ACV*	+Y-8ACV*+D̄-OACUM	+N#S°°|H&+./°°|H̄	&JKO°CU<AC°D+JO:	YC-°+D̄-°O.BYVEJ<	|C&UG4I4FF210017
T(&9SCD̄Y+°&9GCD̄Y	@&°T"CH<H"-T"OH*	BG-°°°°°°OH*BFSG	2/OT°/OHĒ&°°°CM	BCUPS°-G°/O6#°CM	>AOMA:28FF210018
T+°:$OH*BF/D@Q°T	ĒCEUH6&TĒOH*BFS.	K°&3°/O6ZOH*BFUI	HC?."8L1*B(Y<D&T	RB(,°/OHĒI%BG°S.	"°BHĒ3A4FF210019
T+-#O8*BG°°°°°&	D°°MH-&°°4'$G>>L	T&<|O5(¬L1;|E&FA	°6*PM5>PE&FCBOWA	°1_X@5DCL1*$T&|I	°8>Q°Ē&4FF210020

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
TFO#28UCT2<PN&(X	E8%PT&<TA4=(°8'R	°6*PS8@G¬8O°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°_°°E8 FF210021
°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°FF210022
*°FF2°-°SYSTEM°T	EST°SUPERVISOR.°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°*°FF210023
*°°°°TO°OBTAIN°A	°LOGOUT°SET°SWIT	CH°1°AND°2°TO°-B	B-.°°WHEN°LOGOUT	°IS°COMLETE,°°°°	°°°°°°*°°FF210024
*°°°°REMOVE°-BB-	°FROM°SWITCHES.°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°*°°FF210025
°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°°°°°°°°	°°°°°°°°FF210026
E""'*E7*=¬DC"PH$	="7M&F|°°°|°°C°	°°F%°°°ASC°°°R°A	SO°°°Q°°°°°°°°°°	°°°°°13490630750	51376"8@FF210027

LAST PAGE

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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                  2 *                                             LAST CHG:07/16/76
                                  3          DECK  4
                                  4          SEQ   0
                                  5          TREP
                                  6 *
    0000                          7 C12      START C
                                  8 ***********************************************************************
                                  9 *                                                                     *
                                 10 *                         SECTION PREFACE                             *
                                 11 *                                                                     *
                                 12 ***********************************************************************
                                 13 *
    0A00                         14          ORG   X'0A00'
                                 15 *
    0A00 C123            0A01    16 PID      DC    XL2'C123'       SECTION ID AND REVISION LEVEL
    0A02 00              0A02    17          DC    XL1'00'         SECTION FLAGS
    0A03 01              0A03    18 RTN      DC    XL1'01'         CURRENT ROUTINE NUMBER
    0A04 0000            0A05    19          DC    XL2'0000'       RESERVED
    0A06 0A3A            0A07    20 PFC      DC    AL2(RTN01)      ADDRESS OF FIRST ROUTINE PREFACE
    0A08 FFFF            0A09    21          DC    XL2'FFFF'       RESERVED
                                 22 *
    0A0A C14000          0A0C    23 UDT0     DC    XL3'C14000'     3340 UDT
    0A0D 101000          0A0F    24 UDT1     DC    XL3'101000'     5471 UDT FOR AMOP LINK
                                 25 *
    0A10                 0A18    26          DS    XL9             RESERVED
                                 27 *
    0A19 00              0A19    28 COM      DC    XL1'00'         3340 PROGRAM COMMUNICATION AREA
    0A1A                 0A1A    29          DS    XL1             RESERVED
                                 30 *
    0A1B                 0A1C    31 LDRID    DS    AL2             MICROCODE LDR (C17) IN STG INDICATOR
    0A1D                 0A1E    32 AMOPID   DS    AL2             AMOP (C19) IN STG INDICATOR
    0A1F                 0A20    33 FAOID    DS    AL2             ATTACHMENT MICRO-CODE (FAO) IN STG
                                 34 *
    0A21                 0A39    35 SVPFC    DS    XL25            SECTION PREFACE STORAGE AREA
                                 36 *
```



```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                         293A    38          USING DRVWK,XR2         INDEX REG 2 POINTS TO DRV WORK AREA
                                 39 ***********************************************************************
                                 40 *                                                                     *
                                 41 *             ROUTINE 01 - READ STATUS COMMANDS TEST                  *
                                 42 *                                                                     *
                                 43 ***********************************************************************
                                 44 *
    0A3A 01              0A3A    45 RTN01    DC    XL1'01'         ROUTINE NUMBER
    0A3B 00              0A3B    46          DC    XL1'00'         ROUTINE FLAGS
    0A3C 0A74            0A3D    47          DC    AL2(RTN02)      ADDRESS OF NEXT ROUTINE
                                 48 *
    0A3E 3C 0A 28FE              49 R01      MVI   LPCNT,10        LOOP THIS ROUTINE 10 TIMES
                                 50 *
    0A42 C0 87 13B2              51          B     BEGIN           PERFORM ROUTINE INITIALIZATION
    0A46 0A4E            0A47    52          DC    AL2(R01A)       'LOOP' SUBROUTINE RETURN ADDRESS
    0A48 0A66            0A49    53          DC    AL2(R01B)       'NXDRV' SUBROUTINE RETURN ADDRESS
                                 54 *
    0A4A C0 87 1597              55          B     RECAL           RECALIBRATE
                                 56 *
    0A4E C0 87 1863              57 R01A     B     RDSNS           READ DIAGNOSTIC SENSE DATA
    0A52 C0 87 184B              58          B     RDLOG           READ AND RESET BUFFERED LOG
                                 59 *
    0A56 3A 01 290E              60          SBN   IDDDR,1         START DDDF ON ODD STORAGE ADDRESS
                                 61 *
    0A5A C0 87 1863              62          B     RDSNS           READ DIAGNOSTIC SENSE DATA
    0A5E C0 87 184B              63          B     RDLOG           READ AND RESET BUFFERED LOG
                                 64 *
    0A62 C0 87 1496              65          B     NXDRV           REPEAT FOR EACH DRIVE BEING TESTED
                                 66 *
    0A66 0F 00 28FE 280F         67 R01B     SLC   LPCNT(1),P1     DECREMENT LOOP COUNTER
    0A6C C0 01 14EE              68          BNZ   LOOP            REPEAT TEST 10 TIMES
                                 69 *
    0A70 C0 87 0216              70          B     LINK            GO TO NEXT ROUTINE
                                 71 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           73 ********************************************************************************
                           74 *                                                                              *
                           75 *              ROUTINE 02 - CYLINDER ZERO ACCESS TEST                          *
                           76 *                                                                              *
                           77 ********************************************************************************
                           78 *
  0A74 02                  0A74  79 RTN02    DC    XL1'02'           ROUTINE NUMBER
  0A75 00                  0A75  80          DC    XL1'00'           ROUTINE FLAGS
  0A76 0A81                0A77  81          DC    AL2(RTN03)        ADDRESS OF NEXT ROUTINE
                                 82 *
  0A78 3C 00 0A94                83 R02      MVI   R02A1,0           INITIALIZE HEAD ADDR TO 0
                                 84 *
  0A7C C0 87 13B2                85          B     BEGIN             PERFORM ROUTINE INITIALIZATION
  0A80 0A84                0A81  86          DC    AL2(R02A)         'LOOP' SUBROUTINE RETURN ADDRESS
  0A82 0A9F                0A83  87          DC    AL2(R02B)         'NXDRV' SUBROUTINE RETURN ADDRESS
                                 88 *
  0A84 C0 87 1597                89 R02A     B     RECAL             RECALIBRATE
  0A88 C0 87 1863                90          B     RDSNS             DETERMINE DATA MODULE SIZE
  0A8C C0 87 16AD                91          B     RDHAE             READ HOME ADDR AND RO COUNT EVEN
                                 92 *
  0A90 C0 87 15BB                93          B     SEEK              SEEK
  0A94                     0A94  94 R02A1    DS    IL1               PHYSICAL HEAD ADDRESS
  0A95 0000                0A96  95          DC    IL2'0'            PHYSICAL CYLINDER ADDRESS
                                 96 *
  0A97 C0 87 16AD                97          B     RDHAE             READ HOME ADDR AND RO COUNT EVEN
                                 98 *
  0A9B C0 87 1496                99          B     NXDRV             REPEAT FOR EACH DRIVE BEING TESTED
                                100 *
  0A9F 0E 00 0A94 280F          101 R02B     ALC   R02A1(1),P1       INCREMENT HEAD ADDRESS
                                102 *
  0AA5 3D 0C 0A94               103          CLI   R02A1,12          LOOP UNTIL ALL HEADS
  0AA9 C0 82 14EE               104          BL    LOOP                HAVE BEEN TESTED
                                105 *
  0AAD C0 87 0216               106          B     LINK              GO TO NEXT ROUTINE
                                107 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          109 ********************************************************************************
                          110 *                                                                              *
                          111 *              ROUTINE 03 - CE CYLINDER ACCESS TEST                            *
                          112 *                                                                              *
                          113 ********************************************************************************
                          114 *
  0AB1 03                 0AB1 115 RTN03    DC    XL1'03'           ROUTINE NUMBER
  0AB2 00                 0AB2 116          DC    XL1'00'           ROUTINE FLAGS
  0AB3 0AEA               0AB4 117          DC    AL2(RTN04)        ADDRESS OF NEXT ROUTINE
                               118 *
  0AB5 3C 00 0ACD               119 R03      MVI   R03A1,0           INITIALIZE HEAD ADDR TO 0
                               120 *
  0AB9 C0 87 13B2               121          B     BEGIN             PERFORM ROUTINE INITIALIZATION
  0ABD 0AC1               0ABE  122          DC    AL2(R03A)         'LOOP' SUBROUTINE RETURN ADDRESS
  0ABF 0AD8               0AC0  123          DC    AL2(R03B)         'NXDRV' SUBROUTINE RETURN ADDRESS
                               124 *
  0AC1 C0 87 1597               125 R03A     B     RECAL             RECALIBRATE
  0AC5 C0 87 1863               126          B     RDSNS             DETERMINE DATA MODULE SIZE
                               127 *
  0AC9 C0 87 15BB               128          B     SEEK              SEEK (3340 PHYSICAL ADDRESS)
  0ACD                    0ACD 129 R03A1    DS    IL1                 HEAD 0 - 11
  0ACE 015D               0ACF 130          DC    IL2'349'            CYLINDER 349
                               131 *
  0AD0 C0 87 16AD               132          B     RDHAE             READ HOME ADDR AND RO COUNT EVEN
                               133 *
  0AD4 C0 87 1496               134          B     NXDRV             REPEAT FOR EACH DRIVE BEING TESTED
                               135 *
  0AD8 0E 00 0ACD 280F          136 R03B     ALC   R03A1(1),P1       INCREMENT HEAD ADDRESS
                               137 *
  0ADE 3D 0C 0ACD               138          CLI   R03A1,12          LOOP UNTIL ALL HEADS
  0AE2 C0 82 14EE               139          BL    LOOP                HAVE BEEN TESTED
                               140 *
  0AE6 C0 87 0216               141          B     LINK              GO TO NEXT ROUTINE
                               142 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          144 ********************************************************************************
                          145 *                                                                              *
                          146 *                ROUTINE 04 - CYLINDER ZERO READ DATA TRANSFER TEST            *
                          147 *                                                                              *
                          148 ********************************************************************************
                          149 *
 0AEA 04            0AEA  150 RTN04   DC    XL1'04'          ROUTINE NUMBER
 0AEB 00            0AEB  151         DC    XL1'00'          ROUTIN  FLAGS
 0AEC 0B38          0AED  152         DC    AL2(RTN05)       ADDRESS OF NEXT ROUTINE
                          153 *
 0AEE 3C 00 0B06          154 R04     MVI   R04B1,0          INITIALIZE HEAD ADDR TO 0
                          155 *
 0AF2 C0 87 13B2          156         B     BEGIN            PERFORM ROUTINE INITIALIZATION
 0AF6 0B02          0AF7  157         DC    AL2(R04B)        'LOOP' SUBROUTINE RETURN ADDRESS
 0AF8 0B26          0AF9  158         DC    AL2(R04C)        'NXDRV' SUBROUTINE RETURN ADDRESS
                          159 *
 0AFA C0 87 1597          160 R04A    B     RECAL            RECALIBRATE
 0AFE C0 87 1863          161         B     RDSNS            DETERMINE DATA MODULE SIZE
                          162 *
 0B02 C0 87 15BB          163 R04B    B     SEEK             SEEK (3340 PHYSICAL ADDRESS)
 0B06               0B06  164 R04B1   DS    1L1                 HEAD 0 - 11
 0B07 0000          0B08  165         DC    1L2'0'              CYLINDER 0
                          166 *
 0B09 C0 87 16AD          167         B     RDHAE            READ HOME ADDR AND RO COUNT EVEN
                          168 *
 0B0D C0 87 1741          169         B     RDCKD            READ COUNT-KEY-DATA
 0B11 00            0B11  170         DC    1L1'0'              RECORD 0 (EVEN)
                          171 *
 0B12 3A 01 290C          172         SBN   IDDCR,1          CHECK AGAIN USING
 0B16 3A 01 290E          173         SBN   IDDDR,1             ODD STORAGE ADDRESSES
                          174 *
 0B1A C0 87 16C0          175         B     RDHAO            READ HOME ADDR AND RO COUNT ODD
 0B1E C0 87 16FF          176         B     RDRO0            READ KEY-DATA RECORD 0 ODD
                          177 *
 0B22 C0 87 1496          178         B     NXDRV            REPEAT FOR EACH DRIVE BEING TESTED
                          179 *
 0B26 0E 00 0B06 280F     180 R04C    ALC   R04B1(1),P1       INCREMENT HEAD ADDRESS
                          181 *
 0B2C 3D 0C 0B06          182         CLI   R04B1,12         LOOP UNTIL ALL HEADS
 0B30 C0 82 14EE          183         BL    LOOP                HAVE BEEN TESTED
                          184 *
 0B34 C0 87 0216          185         B     LINK             GO TO NEXT ROUTINE
                          186 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          188 ********************************************************************************
                          189 *                                                                              *
                          190 *                ROUTINE 05 - CE CYLINDER READ DATA TRANSFER TEST              *
                          191 *                                                                              *
                          192 ********************************************************************************
                          193 *
 0B38 05            0B38  194 RTN05   DC    XL1'05'          ROUTINE NUMBER
 0B39 00            0B39  195         DC    XL1'00'          ROUTINE FLAGS
 0B3A 0BC4          0B3B  196         DC    AL2(RTN06)       ADDRESS OF NEXT ROUTINE
                          197 *
 0B3C 3C 00 0B54          198 R05     MVI   R05B1,0          INITIALIZE HEAD ADDR TO 0
                          199 *
 0B40 C0 87 13B2          200         B     BEGIN            PERFORM ROUTINE INITIALIZATION
 0B44 0B50          0B45  201         DC    AL2(R05B)        'LOOP' SUBROUTINE RETURN ADDRESS
 0B46 0BB2          0B47  202         DC    AL2(R05C)        'NXDRV' SUBROUTINE RETURN ADDRESS
                          203 *
 0B48 C0 87 1597          204 R05A    B     RECAL            RECALIBRATE
 0B4C C0 87 1863          205         B     RDSNS            DETERMINE DATA MODULE SIZE
                          206 *
 0B50 C0 87 15BB          207 R05B    B     SEEK             SEEK (3340 PHYSICAL ADDRESS)
 0B54               0B54  208 R05B1   DS    1L1                 HEAD 0 - 11
 0B55 015D          0B56  209         DC    1L2'349'            CYLINDER 349
                          210 *
 0B57 C0 87 16AD          211 R05B2   B     RDHAE            READ HOME ADDR AND RO COUNT EVEN
                          212 *
 0B5B C0 87 1A29          213         B     ORIENT           TRACK ORIENTATION DELAY
                          214 *
 0B5F C0 87 1741          215         B     RDCKD            READ COUNT-KEY-DATA
 0B63 00            0B63  216         DC    1L1'0'              RECORD 0 (EVEN)
                          217 *
 0B64 C0 87 1A29          218         B     ORIENT           TRACK ORIENTATION DELAY
                          219 *
 0B68 C0 87 1741          220         B     RDCKD            READ COUNT-KEY-DATA
 0B6C 01            0B6C  221         DC    1L1'1'              RECORD 1
                          222 *
 0B6D 8D 02 14 2827       223         CLC   DL(3,XR2),P256   GO TO ERROR END IF
 0B72 C0 01 1CF3          224         BNE   ERR18               RESIDUAL KL/DL INCORRECT
                          225 *
 0B76 35 01 290E          226         L     IDDDR,XR1        POINT TO RESIDUAL DDDF
                          227 *
 0B7A 4D 03 03 2839       228 R05B3   CLC   3(4,XR1),WCPTN     CONTINUE IF RESIDUAL                03
 0B7F F2 81 13            229         JE    R05D                DDDF IS CORRECT                   03
                          230 *                                                                     03
                          231         MVC   EXP(4),WCPTN     SAVE EXPECTED RESIDUAL DDDF         03
                          232         MVC   ACT,3(4,XR1)     SAVE ACTUAL RESIDUAL DDDF           03
                          233         SBN   IND2,DDDFER      TURN ON RESID DDDF ERROR IND        03
                          234 *                                                                     03
 0B82 0C 03 2930 2839     235         B     ERR19            GO TO ERROR END                     03
 0B88 1C 03 2934 03       236 *                                                                     03
 0B8D 3A 80 28E5          237 R05D    LA    4(,XR1),XR1      LOOP UNTIL                          03
                          238         SLC   RDDCF+8(2),P4       ALL OF RESIDUAL DDDF             03
 0B91 C0 87 1D03          239         BNZ   R05B3                  HAS BEEN CHECKED               03
                          240 *
 0B95 D2 01 04            241         TBN   IDDDR,1          READ AND CHECK
 0B98 0F 01 2925 2815     242         SBN   IDDDR,1             RECORD 1 AGAIN
 0B9E C0 01 0B7A          243         BF    R05B2                  USING ODD STORAGE ADDRESS
                          244 *
 0BA2 38 01 290E          245         B     NXDRV            REPEAT FOR EACH DRIVE BEING TESTED
 0BA6 3A 01 290E          246 *
 0BAA C0 90 0B57          247 R05C    ALC   R05B1(1),P1      INCREMENT HEAD ADDRESS
                          248 *
 0BAE C0 87 1496          249         CLI   R05B1,12         LOOP UNTIL ALL HEADS
                          250         BL    LOOP                HAVE BEEN TESTED
 0BB2 0E 00 0B54 280F     251 *
                          252         B     LINK             GO TO NEXT ROUTINE
 0BB8 3D 0C 0B54          253 *
 0BBC C0 82 14EE
 0BC0 C0 87 0216
```

C123 3340 FUNCTION TESTS - MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              255 ********************************************************************************
                              256 *                                                                              *
                              257 *                ROUTINE 06 - WRITE DATA TRANSFER TEST                         *
                              258 *                                                                              *
                              259 ********************************************************************************
                              260 *
  0BC4 06                 0BC4 261 RTN06    DC    XL1'06'            ROUTINE NUMBER
  0BC5 00                 0BC5 262          DC    XL1'00'            ROUTINE FLAGS
  0BC6 0C5D               0BC7 263          DC    AL2(RTN07)         ADDRESS OF NEXT ROUTINE
                              264 *
  0BC8 3C 0A 28FE              265 R06       MVI   LPCNT,10           LOOP THIS TEST 10 TIMES
                              266 *
  0BCC C0 87 13B2              267           B     BEGIN              PERFORM ROUTINE INITIALIZATION
  0BD0 0BE3               0BD1 268          DC    AL2(R06B)          'LOOP' SUBROUTINE RETURN ADDRESS
  0BD2 0C4F               0BD3 269          DC    AL2(R06C)          'NXDRV' SUBROUTINE RETURN ADDRESS
                              270 *
  0BD4 C0 87 1597              271 R06A      B     RECAL              RECALIBRATE
  0BD8 C0 87 1863              272           B     RDSNS              DETERMINE DATA MODULE SIZE
                              273 *
  0BDC C0 87 15BB              274           B     SEEK               SEEK (3340 PHYSICAL ADDRESS)
  0BE0 00                 0BE0 275          DC    IL1'0'               HEAD 0
  0BE1 015D               0BE2 276          DC    IL2'349'             CYLINDER 349
                              277 *
  0BE3 B8 08 00                278 R06B      TBN   DIND(,XR2),NOWR    BYPASS DRIVE IF
  0BE6 C0 10 1496              279           BT    NXDRV                WRITE INHIBITED
                              280 *
  0BEA C0 87 16AD              281           B     RDHAE              READ HOME ADDR AND R0 COUNT EVEN
                              282 *
  0BEE C0 87 1A29              283           B     ORIENT             TRACK ORIENTATION DELAY
                              284 *
  0BF2 C0 87 1741              285 R06B1     B     RDCKD              READ COUNT-KEY-DATA
  0BF6 01                 0BF6 286          DC    IL1'1'               RECORD 1
                              287 *
  0BF7 C0 87 1A29              288           B     ORIENT             TRACK ORIENTATION DELAY
                              289 *
  0BFB C0 87 1906              290           B     WRCKD              WRITE COUNT-KEY-DATA
  0BFF 02                 0BFF 291          DC    IL1'2'               RECORD 2
  0C00 00                 0C00 292          DC    IL1'0'               NN = 00
                              293 *
  0C01 C0 87 1A29              294           B     ORIENT             TRACK ORIENTATION DELAY
                              295 *
  0C05 C0 87 1741              296           B     RDCKD              READ COUNT-KEY-DATA
  0C09 02                 0C09 297          DC    IL1'2'               RECORD 2
                              298 *
  0C0A 8D 02 14 2827           299           CLC   DL(3,XR2),P256     GO TO ERROR END IF
  0C0F C0 01 1CF3              300           BNE   ERR18                RESIDUAL KL/DL INCORRECT
                              301 *
  0C13 35 01 290E              302           L     IDDDR,XR1          POINT TO RESIDUAL DDDF
                              303 *
  0C17 4D 03 03 2839           304 R06B2     CLC   3(4,XR1),WCPTN     CONTINUE IF RESIDUAL
  0C1C F2 81 13                305           JE    R06D                 DDDF IS CORRECT
                              306 *
  0C1F 0C 03 2930 2839         307           MVC   EXP(4),WCPTN       SAVE EXPECTED RESIDUAL DDDF
  0C25 1C 03 2934 03           308           MVC   ACT,3(4,XR1)       SAVE ACTUAL RESIDUAL DDDF
  0C2A 3A 80 28E5              309           SBN   IND2,DDDFER        TURN ON RESID DDDF ERROR IND
                              310 *
  0C2E C0 87 1D03              311           B     ERR19              GO TO ERROR END
                              312 *
  0C32 D2 01 04                313 R06D      LA    4(,XR1),XR1        LOOP UNTIL
  0C35 0F 01 2925 2815         314           SLC   RDDCF+8(2),P4        ALL OF RESIDUAL DDDF
  0C3B C0 01 0C17              315           BNZ   R06B2                HAS BEEN CHECKED
                              316 *
  0C3F 38 01 290E              317           TBN   IDDDR,1            WRITE AND CHECK
  0C43 3A 01 290E              318           SBN   IDDDR,1              RECORD 2 AGAIN
  0C47 C0 90 0BE3              319           BF    R06B                   USING ODD STORAGE ADDRESS
                              320 *
  0C4B C0 87 1496              321           B     NXDRV              REPEAT FOR EACH DRIVE BEING TESTED
                              322 *
```


C123 3340 FUNCTION TESTS - MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  0C4F 0F 00 28FE 280F         323 R06C      SLC   LPCNT(1),P1        LOOP THIS TEST 10 TIMES
  0C55 C0 01 14EE              324           BNZ   LOOP
                               325 *
  0C59 C0 87 0216              326           B     LINK               GO TO NEXT ROUTINE
                               327 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               329 ****************************************************************
                               330 *                                                              *
                               331 *            ROUTINE 07 - WRITE HOME ADDRESS TEST              *
                               332 *                                                              *
                               333 ****************************************************************
                               334 *
 0C5D 07                  0C5D 335 RTN07   DC   XL1'07'          ROUTINE NUMBER
 0C5E 00                  0C5E 336         DC   XL1'00'          ROUTINE FLAGS
 0C5F 0C93                0C60 337         DC   AL2(RTN08)       ADDRESS OF NEXT ROUTINE
                               338 *
 0C61 C0 87 13B2               339         B    BEGIN            PERFORM ROUTINE INITIALIZATION
 0C65 0C69                0C66 340         DC   AL2(R07A)        'LOOP' SUBROUTINE RETURN ADDRESS
 0C67 0C8F                0C68 341         DC   AL2(R07B)        'NXDRV' SUBROUTINE RETURN ADDRESS
                               342 *
 0C69 B8 08 00                 343 R07A    TBN  DIND(,XR2),NOWR  BYPASS DRIVE IF                  02
 0C6C C0 10 1496               344         BT   NXDRV              WRITE INHIBITED                02
                               345 *
 0C70 C0 87 1597               346         B    RECAL            RECALIBRATE                      02
 0C74 C0 87 1863               347         B    RDSNS            DETERMINE DATA MODULE SIZE
                               348 *
 0C78 C0 87 15BB               349         B    SEEK             SEEK (3340 PHYSICAL ADDRESS)
 0C7C 00                  0C7C 350         DC   IL1'0'             HEAD 0
 0C7D 015D                0C7E 351         DC   IL2'349'           CYLINDER 349
                               352 *
 0C7F C0 87 16AD               353         B    RDHAE            READ HOME ADDR AND R0 COUNT EVEN
                               354 *
 0C83 C0 87 18BA               355         B    WRHAO            WRITE HA AND R0 ODD
 0C87 C0 87 16C0               356         B    RDHAO            READ HA AND R0 COUNT ODD
                               357 *
 0C8B C0 87 1496               358         B    NXDRV            REPEAT FOR EACH DRIVE BEING TESTED
                               359 *
 0C8F C0 87 0216               360 R07B    B    LINK             GO TO NEXT ROUTINE
                               361 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               363 ****************************************************************
                               364 *                                                              *
                               365 *            ROUTINE 08 - HEAD WRITE/READ TEST                 *
                               366 *                                                              *
                               367 ****************************************************************
                               368 *
 0C93 08                  0C93 369 RTN08   DC   XL1'08'          ROUTINE NUMBER
 0C94 00                  0C94 370         DC   XL1'00'          ROUTINE FLAGS
 0C95 0D28                0C96 371         DC   AL2(RTN09)       ADDRESS OF NEXT ROUTINE
                               372 *
 0C97 3C 00 0CB6               373 R08     MVI  R08B1,0          INITIALIZE HEAD ADDR TO ZERO
                               374 *
 0C9B C0 87 13B2               375         B    BEGIN            PERFORM ROUTINE INITIALIZATION
 0C9F 0CAB                0CA0 376         DC   AL2(R08B)        'LOOP' SUBROUTINE RETURN ADDRESS
 0CA1 0D16                0CA2 377         DC   AL2(R08C)        'NXDRV' SUBROUTINE RETURN ADDRESS
                               378 *
 0CA3 C0 87 1597               379 R08A    B    RECAL            RECALIBRATE
 0CA7 C0 87 1863               380         B    RDSNS            DETERMINE DATA MODULE SIZE
                               381 *
 0CAB B8 08 00                 382 R08B    TBN  DIND(,XR2),NOWR  BYPASS DRIVE IF                  02
 0CAE C0 10 1496               383         BT   NXDRV              WRITE INHIBITED                02
                               384 *                                                              02
 0CB2 C0 87 15BB               385         B    SEEK             SEEK (3340 PHYSICAL ADDRESS)     02
 0CB6                     0CB6 386 R08B1   DS   IL1                HEAD 0 - 11
 0CB7 015D                0CB8 387         DC   IL2'349'           CYLINDER 349
                               388 *
 0CB9 C0 87 16AD               389         B    RDHAE            READ HOME ADDR AND R0 COUNT EVEN
                               390 *
 0CBD C0 87 18DB               391         B    WRR00            WRITE RECORD ZERO CNT-KEY-DATA ODD
                               392 *
 0CC1 C0 87 1741               393 R08B2   B    RDCKD            READ COUNT-KEY-DATA
 0CC5 01                  0CC5 394         DC   IL1'1'             RECORD 1
                               395 *
 0CC6 C0 87 1906               396         B    WRCKD            WRITE COUNT-KEY-DATA
 0CCA 02                  0CCA 397         DC   IL1'2'             RECORD 2
 0CCB 14                  0CCB 398         DC   IL1'20'            NN = 20
                               399 *
 0CCC C0 87 1741               400         B    RDCKD            READ COUNT-KEY-DATA
 0CD0 15                  0CD0 401         DC   IL1'21'            RECORD 21
                               402 *
 0CD1 8D 02 14 2827            403         CLC  DL(3,XR2),P256   GO TO ERROR END IF
 0CD6 C0 01 1CF3               404         BNE  ERR18              RESIDUAL KL/DL INCORRECT
                               405 *
 0CDA 35 01 290E               406         L    IDDDR,XR1        POINT TO RESIDUAL DDDF
                               407 *
 0CDE 4D 03 03 2839            408 R08B3   CLC  3(4,XR1),WCPTN   CONTINUE IF RESIDUAL             03
 0CE3 F2 81 13                 409         JE   R08D               DDDF IS CORRECT                03
                               410 *                                                              03
 0CE6 0C 03 2930 2839          411         MVC  EXP(4),WCPTN     SAVE EXPECTED RESIDUAL DDDF      03
 0CEC 1C 03 2934 03            412         MVC  ACT,3(4,XR1)     SAVE ACTUAL RESIDUAL DDDF        03
 0CF1 3A 80 28E5               413         SBN  IND2,DDDFER      TURN ON RESID DDDF ERROR IND     03
                               414 *                                                              03
 0CF5 C0 87 1D03               415         B    ERR19            GO TO ERROR END                  03
                               416 *                                                              03
 0CF9 D2 01 04                 417 R08D    LA   4(,XR1),XR1      LOOP UNTIL                       03
 0CFC 0F 01 2925 2815          418         SLC  RDDCF+8(2),P4      ALL OF RESIDUAL DDDF           03
 0D02 C0 01 0CDE               419         BNZ  R08B3                HAS BEEN CHECKED             03
                               420 *                                                              03
 0D06 38 01 290E               421         TBN  IDDDR,1          WRITE AND CHECK
 0D0A 3A 01 290E               422         SBN  IDDDR,1            RECORD 21 AGAIN
 0D0E C0 90 0CC1               423         BF   R08B2                USING ODD STORAGE ADDRESS
                               424 *
 0D12 C0 87 1496               425         B    NXDRV            REPEAT FOR EACH DRIVE BEING TESTED
                               426 *
 0D16 0E 00 0CB6 280F          427 R08C    ALC  R08B1(1),P1      INCREMENT HEAD ADDRESS
                               428 *
 0D1C 3D 0B 0CB6               429         CLI  R08B1,11         LOOP UNTIL ALL
 0D20 C0 04 14EE               430         BNH  LOOP               HEADS HAVE BEEN TESTED
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              431 *
   0D24 C0 87 0216            432          B     LINK              GO TO NEXT ROUTINE
                              433 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              435 ********************************************************************************
                              436 *                                                                              *
                              437 *                ROUTINE 09 - WRITE KEY-DATA TEST                              *
                              438 *                                                                              *
                              439 ********************************************************************************
                              440 *                                                                              03
   0D28 09                0D28 441 RTN09    DC    XL1'09'           ROUTINE NUMBER                               03
   0D29 00                0D29 442          DC    XL1'00'           ROUTINE FLAGS                                03
   0D2A 0E20              0D2B 443          DC    AL2(RTN0A)        ADDRESS OF NEXT ROUTINE                      03
                              444 *                                                                              03
   0D2C 3C 00 0D4B            445 R09      MVI   R09D,0            INITIALIZE HEAD ADDR TO ZERO                 03
                              446 *                                                                              03
   0D30 C0 87 13B2            447          B     BEGIN             PERFORM ROUTINE INITIALIZATION               03
   0D34 0D40              0D35 448          DC    AL2(R09B)         'LOOP' SUBROUTINE RETURN ADDRESS             03
   0D36 0E0E              0D37 449          DC    AL2(R09C)         'NXDRV' SUBROUTINE RETURN ADDRESS            03
                              450 *                                                                              03
   0D38 C0 87 1597            451 R09A     B     RECAL             RECALIBRATE                                  03
   0D3C C0 87 1863            452          B     RDSNS             DETERMINE DATA MODULE SIZE                   03
                              453 *                                                                              03
   0D40 B8 08 00              454 R09B     TBN   DIND(,XR2),NOWR   BYPASS DRIVE IF                              03
   0D43 C0 10 1496            455          BT    NXDRV               WRITE INHIBITED                            03
                              456 *                                                                              03
   0D47 C0 87 15BB            457          B     SEEK              SEEK (3340 PHYSICAL ADDRESS)                 03
   0D4B                   0D4B 458 R09D     DS    1L1                 HEAD 0 - 11                                03
   0D4C 015D              0D4D 459          DC    IL2'349'            CYLINDER 349                               03
                              460 *                                                                              03
   0D4E C0 87 1741            461          B     RDCKD             READ COUNT-KEY-DATA                          03
   0D52 01                0D52 462          DC    IL1'1'              RECORD 1                                   03
                              463 *                                                                              03
   0D53 C0 87 1906            464          B     WRCKD             WRITE COUNT-KEY-DATA                         03
   0D57 02                0D57 465          DC    IL1'2'              RECORD 2                                   03
   0D58 26                0D58 466          DC    IL1'38'             NN = 38                                    03
                              467 *                                                                              03
   0D59 35 01 290E            468          L     IDDDR,XR1         LOAD INITIAL DDDR INTO XR1                   03
   0D5D 0C 01 292C 282F       469          MVC   WORKN(2),P4092    SET UP DDDR COUNTER                          03
                              470 *                                                                              03
   0D62 4C 03 03 2839         471 R09F     MVC   3(4,XR1),WCPTN    FILL DDDR AREA                               03
   0D68 D2 01 04              472          LA    4(,XR1),XR1         WITH 16 RECORDS                            03
   0D6B 0F 01 292C 2815       473          SLC   WORKN(2),P4           OF WORST CASE                            03
   0D71 C0 01 0D63            474          BNZ   R09F                  TEST PATTERN                             03
                              475 *                                                                              03
   0D75 0E 01 290E 2827       476          ALC   IDDDR(2),P256      POINT INIT DDDR TO RECORD 2                  03
                              477 *                                                                              03
   0D7B C0 87 19A5            478          B     WRKD              WRITE KEY DATA                               03
   0D7F 02                0D7F 479          DC    IL1'2'              RECORD 2                                   03
   0D80 26                0D80 480          DC    IL1'38'             NN = 38                                    03
                              481 *                                                                              03
   0D81 0F 01 290E 2827       482          SLC   IDDDR(2),P256     POINT INIT DDDR TO RECORD 1                  03
                              483 *                                                                              03
   0D87 3C 01 0D95            484          MVI   R09E,1            INITIALIZE RDKD TO RECORD 1                  03
   0D8B 0C 01 0DB9 2845       485          MVC   PTR1(2),WCPTN@    SET UP PTR 1 TO WC PATTERN ADDR              03
                              486 *                                                                              03
   0D91 C0 87 179A            487 R09G     B     RDKD              READ KEY-DATA                                03
   0D95 00                0D95 488 R09E     DC    IL1'0'              RECORD X                                   03
   0D96 09                0D96 489          DC    IL1'09'             NN = 09                                    03
                              490 *                                                                              03
   0D97 3D 0B 0D95            491          CLI   R09E,11           JUMP IF NOT                                  03
   0D9B F2 01 06              492          JNE   R09J                RECORD 11                                  03
                              493 *                                                                              03
   0D9E 0C 01 0DB9 0DBB       494          MVC   PTR1(2),PTR2      SET POINTER 1 TO POINTER 2                   03
                              495 *                                                                              03
   0DA4 0C 01 292C 2828       496 R09J     MVC   WORKN(2),P640     SET UP 10 RECORD COUNTER                     03
                              497 *                                                                              03
   0DAA 0C 01 0DBB 290E       498          MVC   PTR2(2),IDDDR     SET UP POINTER 2 TO                          03
   0DB0 0E 01 0DBB 2813       499          ALC   PTR2(2),P3            INITIAL DDDR                           03
                              500 *                                                                              03
   0DB6 0D 03 0000 0000       501 R09I     CLC   *-*(4),*-*        CONTINUE IF RESIDUAL                         03
   0DBC F2 81 20              502          JE    R09K                DDDF IS CORRECT                            03
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          503 *
 0DBF 0C 01 0DD0 0DB9     504          MVC   R09L+5(2),PTR1     SET UP TO SAVE EXP RESID DDDF
 0DC5 0C 01 0DD6 0DBB     505          MVC   R09M+5(2),PTR2     SET UP TO SAVE ACT RESID DDDF
 0DCB 0C 03 2930 0000     506 R09L     MVC   EXP(4),*-*         SAVE EXP RESIDUAL DDDF
 0DD1 0C 03 2934 0000     507 R09M     MVC   ACT(4),*-*         SAVE ACT RESIDUAL DDDF
 0DD7 3A 80 28E5          508          SBN   IND2,DDDFER        TURN ON RESID DDDF ERROR IND
                          509 *
 0DDB C0 87 1D03          510          B     ERR19              GO TO ERROR END
                          511 *
 0DDF 3D 01 0D95          512 R09K     CLI   R09E,1             JUMP IF
 0DE3 F2 81 06            513          JE    RC9I                 RECORD 1
                          514 *
 0DE6 0E 01 0DB9 2815     515          ALC   PTR1(2),P4         INCREMENT POINTER 1
                          516 *
 0DEC 0E 01 0DBB 2815     517 R09I     ALC   PTR2(2),P4         INCREMENT POINTER 2
                          518 *
 0DF2 0F 01 292C 280F     519          SLC   WORKN(2),P1        LOOP UNTIL 10
 0DF8 C0 01 0DB6          520          BNZ   R09H                 RECORDS CHECKED
                          521 *
 0DFC 0E 00 0D95 281F     522          ALC   R09E(1),P10        SET UP TO READ NEXT 10 RECORDS
                          523 *
 0E02 3D 29 0D95          524          CLI   R09E,41            READ NEXT 10 RECORDS
 0E06 C0 82 0D91          525          BL    R09G                 IF 40 RECORDS NOT READ
                          526 *
 0E0A C0 87 1496          527          B     NXDRV              REPEAT FOR EACH DRIVE TESTED
                          528 *
 0E0E 0E 00 0D4B 280F     529 R09C     ALC   R09D(1),P1         INCREMENT HEAD ADDRESS
                          530 *
 0E14 3D 08 0D4B          531          CLI   R09D,11            LOOP UNTIL ALL
 0E18 C0 04 14EE          532          BNH   LOOP                 HEADS HAVE BEEN TESTED
                          533 *
 0E1C C0 87 0216          534          B     LINK               GO TO NEXT ROUTINE
                          535 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          537 ********************************************************************************
                          538 *                                                                              *
                          539 *              ROUTINE 0A - SCAN FF DETECT TEST                                *
                          540 *                                                                              *
                          541 ********************************************************************************
                          542 *
03                        543 RTN0A    DC    XL1'0A'            ROUTINE NUMBER
03 0E21 00                544          DC    XL1'00'            ROUTINE FLAGS
03 0E22 0EE3      0E23    545          DC    AL2(RTN0B)         ADDRESS OF NEXT ROUTINE
03                        546 *
03 0E24 0C 03 283D 2839   547 R0A      MVC   PATRN+3(4),WCPTN   INITIALIZE
03 0E2A 3C FE 283B        548          MVI   PATRN+1,X'FE'        TEST PATTERN
03                        549 *
03 0E2E C0 87 13B2        550          B     BEGIN              PERFORM ROUTINE INITIALIZATION
03 0E32 0E45      0E33    551          DC    AL2(R0AB)          'LOOP' SUBROUTINE RETURN ADDRESS
03 0E34 0ECD      0E35    552          DC    AL2(R0AC)          'NXDRV' SUBROUTINE RETURN ADDRESS
03                        553 *
03 0E36 C0 87 1597        554 R0AA     B     RECAL              RECALIBRATE
03 0E3A C0 87 1863        555          B     RDSNS              DETERMINE DATA MODULE SIZE
03                        556 *
03 0E3E C0 87 15BB        557          B     SEEK               SEEK (3340 PHYSICAL ADDRESS)
03 0E42 00        0E42    558          DC    IL1'0'               HEAD 0
03 0E43 015D      0E44    559          DC    IL2'349'             CE CYLINDER
03                        560 *
03 0E45 C0 97 16AD        561 R0AB     B     RDHAE              READ HOME ADDR AND R0 COUNT EVEN
03                        562 *
03 0E49 C0 87 1A29        563          B     ORIENT             TRACK ORIENTATION DELAY
03                        564 *
03 0E4D 3C FF 2C77        565          MVI   DDDF+255,X'FF'       SETUP SCAN
03 0E51 0C FE 2C76 2C77   566          MVC   DDDF+254(255),DDDF+255   ARGUMENT IN
03 0E57 0C 02 287A 283C   567          MVC   DDDF+2(3),PATRN+2      DDDF AREA
03                        568 *
03 0E5D C0 87 19B9        569          B     SCANE              SCAN  EQUAL
03 0E61 01        0E61    570          DC    IL1'1'               RECORD 1
03 0E62 00        0E62    571          DC    IL1'0'               NN = 00
03                        572 *
03 0E63 C1 C3 1CD0        573          TIO   ERR15,X'C3'        ERROR IF SCAN HIT
03                        574 *
03 0E67 C0 87 1A29        575          B     ORIENT             TRACK ORIENTATION DELAY
03                        576 *
03 0E6B C0 87 19CD        577          B     SCANH              SCAN HIGH OR EQUAL
03 0E6F 01        0E6F    578          DC    IL1'1'               RECORD 1
03 0E70 00        0E70    579          DC    IL1'0'               NN = 00
03                        580 *
03 0E71 C1 C3 1CD0        581          TIO   ERR15,X'C3'        ERROR IF SCAN HIT
03                        582 *
03 0E75 C0 87 1A29        583          B     ORIENT             TRACK ORIENTATION DELAY
03                        584 *
03 0E79 C0 87 1A01        585          B     SCNRE              SCAN READ OR EQUAL
03 0E7D 01        0E7D    586          DC    IL1'1'               RECORD 1
03 0E7E 00        0E7E    587          DC    IL1'0'               NN = 00
03                        588 *
03 0E7F C1 C3 1CD0        589          TIO   ERR15,X'C3'        ERROR IF SCAN HIT
03                        590 *
03 0E83 C0 87 1A29        591          B     ORIENT             TRACK ORIENTATION DELAY
03                        592 *
03 0E87 C0 87 1A15        593          B     SCNRH              SCAN READ OR HIGH OR EQUAL
03 0E8B 01        0E8B    594          DC    IL1'1'               RECORD 1
03 0E8C 00        0E8C    595          DC    IL1'0'               NN = 00
03                        596 *
03 0E8D C1 C3 1CD0        597          TIO   ERR15,X'C3'        ERROR IF SCAN HIT
03                        598 *
03 0E91 C0 87 1A29        599          B     ORIENT             TRACK ORIENTATION DELAY
03                        600 *
03 0E95 3C 77 2B79        601          MVI   DDDF+1,X'77'       CHANGE DDDF TO CAUSE SCAN HIT
03                        602 *
03 0E99 C0 87 19CD        603          B     SCANH              SCAN HIGH OR EQUAL
03 0E9D 01        0E9D    604          DC    IL1'1'               RECORD 1
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E9E 00               0E9E  605          DC    IL1'0'            NN = 00
                               606 *
   0E9F C1 C3 0EA7             607          TIO   ROAB1,X'C3'       ERROR IF
   0EA3 C0 87 1CC7             608          B     ERR14               NO SCAN HIT
                               609 *
   0EA7 38 40 2928             610 ROAB1    TBN   SNS,BIT1          ERROR IF NO
   0EAB C0 90 1CBE             611          BF    ERR13               SCAN EQUAL CONDITION
                               612 *
   0EAF C0 87 1A29             613          B     ORIENT            TRACK ORIENTATION DELAY
                               614 *
   0EB3 C0 87 1A15             615          B     SCNRH             SCAN READ OR HIGH OR EQUAL
   0EB7 01               0EB7  616          DC    IL1'1'              RECORD 1
   0EB8 00               0EB8  617          DC    IL1'0'              NN = 00
                               618 *
   0EB9 C1 C3 0EC1             619          TIO   ROAB2,X'C3'       ERROR IF
   0EBD C0 87 1CC7             620          B     ERR14               NO SCAN HIT
                               621 *
   0EC1 38 40 2928             622 ROAB2    TBN   SNS,BIT1          ERROR IF NO
   0EC5 C0 90 1CBE             623          BF    ERR13               SCAN EQUAL CONDITION
                               624 *
   0EC9 C0 87 1496             625          B     NXDRV             REPEAT FOR EACH DRIVE BEING TESTED
                               626 *
   0ECD 0E 00 283B 283B        627 ROAC     ALC   PATRN+1(1),PATRN+1  SHIFT TEST PATTERN
   0ED3 3A 01 283B             628          SBN   PATRN+1,BIT7         BYTE LEFT ONE BIT POSITION
                               629 *
   0ED7 3D FF 283B             630          CLI   PATRN+1,X'FF'         LOOP UNTIL ALL
   0EDB C0 01 14EE             631          BNE   LOOP                    BIT POSITIONS HAVE BEEN TESTED
                               632 *
   0EDF C0 87 0216             633          B     LINK              GO TO NEXT ROUTINE
                               634 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               636 ********************************************************************************
                               637 *                                                                              *
                               638 *                ROUTINE 0B - SCAN EQUAL TEST                                  *
                               639 *                                                                              *
                               640 ********************************************************************************
                               641 *
   0EE3 0B               0EE3  642 RTN0B    DC    XL1'0B'           ROUTINE NUMBER
   0EE4 00               0EE4  643          DC    XL1'00'           ROUTINE FLAGS
   0EE5 0FAA             0EE6  644          DC    AL2(RTN0C)        ADDRESS OF NEXT ROUTINE
                               645 *
   0EE7 3C 0A 28FE             646 R0B      MVI   LPCNT,10          LOOP THIS TEST 10 TIMES
                               647 *
   0EEB C0 87 13B2             648          B     BEGIN             PERFORM ROUTINE INITIALIZATION
   0EEF 0F02             0EF0  649          DC    AL2(R0BB)         'LOOP' SUBROUTINE RETURN ADDRESS
   0EF1 0F9C             0EF2  650          DC    AL2(R0BC)         'NXDRV' SUBROUTINE RETURN ADDRESS
                               651 *
   0EF3 C0 87 1597             652 R0BA     B     RECAL             RECALIBRATE
   0EF7 C0 87 1863             653          B     RDSNS             DETERMINE DATA MODULE SIZE
                               654 *
   0EFB C0 87 15B8             655          B     SEEK              SEEK (3340 PHYSICAL ADDRESS)
   0EFF 00               0EFF  656          DC    IL1'0'              HEAD 0
   0F00 015D             0F01  657          DC    IL2'349'            CE CYLINDER
                               658 *
   0F02 C0 87 15AD             659 R0BB     B     RDHAE             READ HOME ADDR AND R0 COUNT EVEN
                               660 *
   0F06 C0 87 1A29             661          B     ORIENT            TRACK ORIENTATION DELAY
                               662 *
   0F0A 3C FF 2C78             663          MVI   DDDF+256,X'FF'        SETUP SCAN
   0F0E 0C FF 2C77 2C78        664          MVC   DDDF+255(256),DDDF+256  ARGUMENT IN
   0F14 0C 03 2B7E 2839        665          MVC   DDDF+6(4),WCPTN           DDDF AREA
   0F1A 0C 01 2B7B 2839        666          MVC   DDDF+3(2),WCPTN
   0F20 0C 01 2B79 2808        667          MVC   DDDF+1(2),NULLS
                               668 *
   0F26 38 01 290E             669          TBN   IDDDR,BIT7          SKIP IF DDDF IS
   0F2A F2 90 06               670          JF    R0BB1                 ON EVEN ADDRESS BOUNDARY
                               671 *
   0F2D 0C 05 2B7F 2B7E        672          MVC   DDDF+7(6),DDDF+6    SHIFT SCAN ARGUMENT FOR ODD BOUNDARY
                               673 *
   0F33 C0 87 19B9             674 R0BB1    B     SCANE               SCAN EQUAL
   0F37 01               0F37  675          DC    IL1'1'                RECORD 1
   0F38 00               0F38  676          DC    IL1'0'                NN = 00
                               677 *
   0F39 C1 C3 0F41             678          TIO   R0BB2,X'C3'       ERROR IF
   0F3D C0 87 1CC7             679          B     ERR14               NO SCAN HIT
                               680 *
   0F41 38 40 2928             681 R0BB2    TBN   SNS,BIT1          ERROR IF NO
   0F45 C0 90 1CBE             682          BF    ERR13               SCAN EQUAL CONDITION
                               683 *
   0F49 38 01 290E             684          TBN   IDDDR,BIT7          SKIP IF DDDF IS
   0F4D F2 10 0E               685          JT    R0BB3                 ON ODD ADDRESS BOUNDARY
                               686 *
   0F50 0D 03 2B82 2835        687          CLC   DDDF+10(4),FFPTN    ERROR IF RESIDUAL
   0F56 C0 01 1D03             688          BNE   ERR19                 DDDF IS INCORRECT
                               689 *
   0F5A C0 87 0F68             690          B     R0BB4               REPEAT TEST FOR SCAN OR EQUAL
                               691 *
   0F5E 0D 03 2B83 2835        692 R0BB3    CLC   DDDF+11(4),FFPTN    ERROR IF RESIDUAL
   0F64 C0 01 1D03             693          BNE   ERR19                 DDDF IS INCORRECT
                               694 *
   0F68 C0 87 1A29             695 R0BB4    B     ORIENT            TRACK ORIENTATION DELAY
                               696 *
   0F6C C0 87 1A01             697          B     SCNRE             SCAN READ OR EQUAL
   0F70 01               0F70  698          DC    IL1'1'              RECORD 1
   0F71 00               0F71  699          DC    IL1'0'              NN = 00
                               700 *
   0F72 C1 C3 0F7A             701          TIO   R0BB5,X'C3'       ERROR IF
   0F76 C0 87 1CC7             702          B     ERR14               NO SCAN HIT
                               703 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 0F7A 38 40 2928          704 ROBB5    TBN   SNS,BIT1
 0F7E C0 90 1CBE          705          BF    ERR13
                          706 *
 0F82 0D 03 2B82 2839     707          CLC   DDDF+10(4),WCPTN
 0F88 C0 01 1D03          708          BNE   ERR19
                          709 *
 0F8C 38 01 290E          710          TBN   IDDDR,BIT7
 0F90 3A 01 290E          711          SBN   IDDDR,BIT7
 0F94 C0 90 0F02          712          BF    ROBB
                          713 *
 0F98 C0 87 1496          714          B     NXDRV
                          715 *
 0F9C 0F 00 28FE 280F     716 ROBC     SLC   LPCNT(1),P1
 0FA2 C0 01 14EE          717          BNZ   LOOP
                          718 *
 0FA6 C0 87 0216          719          B     LINK
                          720 *
```

ERROR IF NO
SCAN EQUAL CONDITION

ERROR IF RESIDUAL
DDDF IS INCORRECT

REPEAT
TEST USING ODD
MAIN STORAGE BOUNDARY

REPEAT FOR EACH DRIVE BEING TESTED

LOOP THIS
TEST 10 TIMES

GO TO NEXT ROUTINE


```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          722 ********************************************************************************
                          723 *                                                                              *
                          724 *                ROUTINE 0C - SCAN HIGH OR EQUAL TEST                          *
                          725 *                                                                              *
                          726 ********************************************************************************
                          727 *
 0FAA 0C                  728 RTN0C    DC    XL1'0C'          ROUTINE NUMBER
 0FAB 00                  729          DC    XL1'00'          ROUTINE FLAGS
 0FAC 1049                730          DC    AL2(RTN0D)       ADDRESS OF NEXT ROUTINE
                          731 *
 0FAE 0C 03 283D 2839     732 R0C      MVC   PATRN+3(4),WCPTN INITIALIZE
 0FB4 3C FE 283C          733          MVI   PATRN+2,X'FE'      TEST PATTERN
                          734 *
                          735          B     BEGIN            PERFORM ROUTINE INITIALIZATION
 0FB8 C0 87 13B2          736          DC    AL2(R0CB)        'LOOP' SUBROUTINE RETURN ADDRESS
 0FBC 0FCF                737          DC    AL2(R0CC)        'NXDRV' SUBROUTINE RETURN ADDRESS
 0FBE 1033                738 *
                          739 ROCA     B     RECAL            RECALIBRATE
 0FC0 C0 87 1597          740          B     RDSNS            DETERMINE DATA MODULE SIZE
 0FC4 C0 87 1863          741 *
                          742          B     SEEK             SEEK (3340 PHYSICAL ADDRESS)
 0FC8 C0 87 15BB          743          DC    IL1'0'             HEAD 0
 0FCC 00                  744          DC    IL2'349'           CE CYLINDER
 0FCD 015D                745 *
                          746 ROCB     B     RDHAE            READ HOME ADDR AND RO COUNT EVEN
 0FCF C0 87 16AD          747 *
                          748          B     ORIENT           TRACK ORIENTATION DELAY
 0FD3 C0 87 1A29          749 *
                          750          MVI   DDDF+255,X'FF'   SETUP SCAN
 0FD7 3C FF 2C77          751          MVC   DDDF+254(255),DDDF+255   ARGUMENT IN
 0FDB 0C FE 2C76 2C77     752          MVC   DDDF+3(4),PATRN+3        DDDF AREA
 0FE1 0C 03 2B7B 283D     753          MVI   DDDF+4,X'FF'
 0FE7 3C FF 2B7C          754 *
                          755          B     SCANH            SCAN HIGH OR EQUAL
 0FEB C0 87 19CD          756          DC    IL1'1'             RECORD 1
 0FEF 01                  757          DC    IL1'0'             NN = 00
 0FF0 00                  758 *
                          759          TIO   ROCB1,X'C3'      ERROR IF
 0FF1 C1 C3 0FF9          760          B     ERR14              NO SCAN HIT
 0FF5 C0 87 1CC7          761 *
                          762 ROCB1    TBN   SNS,BIT1         ERROR IF
 0FF9 38 40 2928          763          BT    ERR1A              SCAN EQUAL CONDITION
 0FFD C0 10 1D13          764 *
                          765          CLC   DDDF+9(4),FFPTN  ERROR IF RESIDUAL
 1001 0D 03 2B81 2835     766          BNE   ERR19              DDDF IS INCORRECT
 1007 C0 01 1D03          767 *
                          768          B     ORIENT           TRACK ORIENTATION DELAY
 100B C0 87 1A29          769 *
                          770          B     SCNRH            SCAN READ OR HIGH OR EQUAL
 100F C0 87 1A15          771          DC    IL1'1'             RECORD 1
 1013 01                  772          DC    IL1'0'             NN = 00
 1014 00                  773 *
                          774          TIO   ROCB2,X'C3'      ERROR IF
 1015 C1 C3 101D          775          B     ERR14              NO SCAN HIT
 1019 C0 87 1CC7          776 *
                          777 ROCB2    TBN   SNS,BIT1         ERROR IF
 101D 38 40 2928          778          BT    ERR1A              SCAN EQUAL CONDITION
 1021 C0 10 1D13          779 *
                          780          CLC   DDDF+9(4),WCPTN  ERROR IF RESIDUAL
 1025 0D 03 2B81 2839     781          BNE   ERR19              DDDF IS INCORRECT
 102B C0 01 1D03          782 *
                          783          B     NXDRV            REPEAT FOR EACH DRIVE BEING TESTED
 102F C0 87 1496          784 *
                          785 ROCC     ALC   PATRN+2(1),PATRN+2   SHIFT TEST PATTERN
 1033 0E 00 283C 283C     786          SBN   PATRN+2,BIT7         BYTE LEFT ONE BIT POSITION
 1039 3A 01 283C          787 *
                          788          CLI   PATRN+2,X'FF'    LOOP UNTIL ALL
 103D 3D FF 283C          789          BNE   LOOP               BIT POSITIONS HAVE BEEN TESTED
 1041 C0 01 14EE
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              790 *
   1045 C0 87 0216            791          B     LINK              GO TO NEXT ROUTINE
                              792 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              794 ********************************************************************************
                              795 *                                                                              *
                              796 *                ROUTINE 0D - WRITE REPEAT / READ VERIFY TEST                  *
                              797 *                                                                              *
                              798 ********************************************************************************
                              799 *
   1049 0D                1049 800 RTN0D    DC    XL1'0D'           ROUTINE NUMBER
   104A 00                104A 801          DC    XL1'00'           ROUTINE FLAGS
   104B 1092              104C 802          DC    AL2(RTN0E)        ADDRESS OF NEXT ROUTINE
                              803 *
   104D C0 87 13B2             804 R0D       B     BEGIN             PERFORM ROUTINE INITIALIZATION
   1051 1064              1052 805          DC    AL2(R0DB)         'LOOP' SUBROUTINE RETURN ADDRESS
   1053 108E              1054 806          DC    AL2(R0DC)         'NXDRV' SUBROUTINE RETURN ADDRESS
                              807 *
   1055 C0 87 1597             808 R0DA      B     RECAL             RECALIBRATE
   1059 C0 87 1863             809           B     RDSNS             DETERMINE DATA MODULE SIZE
                              810 *
   105D C0 87 15B8             811           B     SEEK              SEEK (3340 PHYSICAL ADDRESS)
   1061 00                1061 812          DC    IL1'0'              HEAD 0
   1062 015D              1063 813          DC    IL2'349'            CYLINDER 349
                              814 *                                                                        02
   1064 B8 08 00               815 R0DB      TBN   DIND1(,XR2),NOWR    BYPASS DRIVE IF                    02
   1067 C0 10 1496             816           BT    NXDRV               WRITE INHIBITED                    02
                              817 *
   106B C0 87 16AD             818           B     RDHAE             READ HOME ADDR AND R0 COUNT EVEN   02
                              819 *
   106F C0 87 18DB             820           B     WRR00             WRITE RECORD ZERO CNT-KEY-DATA ODD
                              821 *
   1073 C0 87 1741             822           B     RDCKD             READ COUNT-KEY-DATA
   1077 01                1077 823          DC    IL1'1'              RECORD 1
                              824 *
   1078 C0 87 1906             825           B     WRCKD             WRITE COUNT-KEY-DATA
   107C 02                107C 826          DC    IL1'2'              RECORD 2
   107D 13                107D 827          DC    IL1'19'             NN = 19
                              828 *
   107E C0 87 195E             829           B     WRREP             WRITE REPEAT KEY-DATA
   1082 02                1082 830          DC    IL1'2'              RECORD 2
   1083 13                1083 831          DC    IL1'19'             NN = 19
                              832 *
   1084 C0 87 17FD             833           B     RDVKD             READ VERIFY KEY-DATA
   1088 02                1088 834          DC    IL1'2'              RECORD 2
   1089 13                1089 835          DC    IL1'19'             NN = 19
                              836 *
   108A C0 87 1496             837           B     NXDRV             REPEAT FOR EACH DRIVE BEING TESTED
                              838 *
   108E C0 87 0216             839 R0DC      B     LINK              GO TO NEXT ROUTINE
                              840 *
```

C123   3340 FUNCTION TESTS - MOD 12

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                842 ****************************************************************
                                843 *                                                              *
                                844 *              ROUTINE OE - CYLINDER SEEK TEST                 *
                                845 *                                                              *
                                846 ****************************************************************
                                847 *
     1092 OE               1092 848 RTNOE    DC    XL1'OE'            ROUTINE NUMBER
     1093 00               1093 849          DC    XL1'00'            ROUTINE FLAGS
     1094 1103             1095 850          DC    AL2(RTNOF)         ADDRESS OF NEXT ROUTINE
                                851 *
     1096 OC 01 10BA 280B       852 ROE      MVC   ROEA1(2),NULLS     CYL ADDR = 000 FOR FIRST SEEK
                                853 *
     109C C2 01 0A01            854          LA    PID,XR1            INITIALIZE PSUEDO
     10A0 34 01 28FE            855          ST    LPCNT,XR1            RANDOM NUMBER GENERATOR
                                856 *
     10A4 C0 87 13B2            857          B     BEGIN              PERFORM ROUTINE INITIALIZATION
     10A8 10BF             10A9 858          DC    AL2(ROEB)          'LOOP' SUBROUTINE RETURN ADDRESS
     10AA 10EB             10AB 859          DC    AL2(ROEC)          'NXDRV' SUBROUTINE RETURN ADDRESS
                                860 *
     10AC C0 87 1597            861 ROEA     B     RECAL              RECALIBRATE
     10B0 C0 87 1863            862          B     RDSNS              DETERMINE DATA MODULE SIZE
                                863 *
     10B4 C0 87 15BB            864          B     SEEK               SEEK (3340 PHYSICAL ADDRESS)
     10B8 00               10B8 865          DC    IL1'0'               HEAD 0
     10B9                  10BA 866 ROEA1    DS    IL2                  CYLINDER 0 - 349
                                867 *
     10BB C0 87 16AD            868          B     RDHAE              READ HOME ADDR AND RO COUNT EVEN
                                869 *
     10BF 35 01 28FE            870 ROEB     L     LPCNT,XR1          GENERATE
     10C3 0C 01 10E2 10BA       871          MVC   ROEB2(2),ROEA1       SIMULATED
     10C9 1E 01 10E2 00         872 ROEB1    ALC   ROEB2(2),0(,XR1)       RANDOM
     10CE 3B FE 10E1            873          SBF   ROEB2-1,X'FE'             CYLINDER
     10D2 0D 01 10E2 2829       874          CLC   ROEB2(2),P349               ADDRESS
     10D8 C0 84 10C9            875          BH    ROEB1
                                876 *
     10DC C0 87 15BB            877          B     SEEK               SEEK (3340 PHYSICAL ADDRESS)
     10E0 00               10E0 878          DC    IL1'0'               HEAD 0
     10E1                  10E2 879 ROEB2    DS    IL2                  CYLINDER 0 - 349
                                880 *
     10E3 C0 87 16AD            881          B     RDHAE              READ HOME ADDR AND RO COUNT EVEN
                                882 *
     10E7 C0 87 1496            883          B     NXDRV              REPEAT FOR EACH DRIVE BEING TESTED
                                884 *
     10EB 0C 01 10BA 10E2       885 ROEC     MVC   ROEA1(2),ROEB2     SAVE CYLINDER ADDR FOR ERR RECOVERY
                                886 *
     10F1 0E 01 28FE 280F       887          ALC   LPCNT(2),P1        LOOP UNTIL
     10F7 3D 0C 28FD            888          CLI   LPCNT-1,X'0C'        512 CYLINDER
     10FB C0 01 14EE            889          BNE   LOOP                   SEEKS HAVE BEEN PERFORMED
                                890 *
     10FF C0 87 0216            891          B     LINK               GO TO NEXT ROUTINE
                                892 *
```


C123   3340 FUNCTION TESTS - MOD 12

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                894 ****************************************************************
                                895 *                                                              *
                                896 *              ROUTINE OF - READ IPL TEST                      *
                                897 *                                                              *
                                898 ****************************************************************
                                899 *
     1103 OF               1103 900 RTNOF    DC    XL1'OF'            ROUTINE NUMBER
     1104 00               1104 901          DC    XL1'00'            ROUTINE FLAGS
     1105 11EB             1106 902          DC    AL2(RTN10)         ADDRESS OF NEXT ROUTINE
                                903 *
     1107 39 10 0208            904          TBF   SBYTE3,SSW1B                                            02
     1108 39 40 020A            905          TBF   SBYTE2,SSW11       BYPASS THIS ROUTINE IF
     110F C0 90 11E6            906          BF    NORMN                DRIVE 1 IS NOT BEING TESTED
                                907 *
     1113 3B 20 0A19            908          SBF   COM,MPLFLG         RESET MICRO-PROGRAM LOADED IND       03
     1117 3C 00 27EE            909          MVI   EM30A,0            CLEAR ERROR CODE IN MESSAGE          03
                                910 *                                                                  03
     111B F3 C0 01              911          SIO   X'01',X'C0'        RECALIBRATE DRIVE 1                  03
     111E C1 C1 111E            912          TIO   *,X'C1'            LOOP ON SEEK BUSY                    03
     1122 C1 C2 1122            913          TIO   *,X'C2'            LOOP ON ATTACHMENT BUSY              03
                                914 *
     1126 C0 87 212E            915          B     REGRST             RESET ATTACHMENT REGISTERS
                                916 *
     112A C0 87 1FB5            917          B     SAVRST             GO TO STORE A RESTART ADDR
     112E 31 C4 2849            918          LIO   DDDR,X'C4'         LOAD DDDR
     1132 C0 87 200E            919          B     RSTOR              GO TO RESTORE LOCATION 0
                                920 *
     1136 38 80 28E4            921          TBN   IND,HUNG           ERROR END IF
     113A F2 10 26              922          JT    ROFD                 LIO HANGS IN REJECTION LOOP        03
                                923 *
     113D C0 87 1FB5            924          B     SAVRST             GO TO STORE A RESTART ADDR
     1141 F3 C4 01              925          SIO   X'01',X'C4'        READ IPL
     1144 C0 87 200E            926          B     RSTOR              GO TO RESTORE LOCATION 0
                                927 *
     1148 38 80 28E4            928          TBN   IND,HUNG           ERROR END IF
     114C F2 10 14              929          JT    ROFD                 SIO HANGS IN REJECTION LOOP        03
                                930 *
     114F 0C 02 292C 284C       931          MVC   WORKN(3),TIM3S     INITIALIZE TIMER
                                932 *
     1155 0E 02 292C 280F       933 ROFA     ALC   WORKN(3),P1        INCREMENT ATT BUSY TIMER
     115B C0 A0 1163            934          BOL   ROFD               ERROR END IF ATTACHMENT              03
     115F C1 C2 1155            935          TIO   ROFA,X'C2'           BUSY FAILS TO GO OFF
                                936 *
     1163 30 C4 292A            937 ROFD     SNS   WORKN-2,X'C4'      SENSE RESIDUAL DDDR                  03
                                938 *                                                                  03
     1167 0C 01 292C 2883       939          MVC   WORKN(2),DLY256    SET UP DELAY COUNTER                 03
                                940 *                                                                  03
     116D 0F 01 292C 280F       941 ROFE     SLC   WORKN(2),P1        DELAY ABOUT                          03
     1173 C0 01 116D            942          BNZ   ROFE                 250 MILLI-SEC                      03
                                943 *                                                                  03
     1177 30 C4 2912            944          SNS   RDDDR,X'C4'        SENSE RESIDUAL DDDR                  03
                                945 *                                                                  03
     117B 0D 01 2912 292A       946          CLC   RDDDR(2),WORKN-2   JUMP IF RESIDUAL DDDR                03
     1181 F2 81 04              947          JE    ROFB                 UNCHANGED AFTER DELAY              03
                                948 *                                                                  03
     1184 3C F0 27EE            949          MVI   EM30A,C'0'         SET UP FOR ERROR CODE 2030           03
                                950 *                                                                  03
     1188 35 01 2849            951 ROFB     L     DDDR,XR1           CALCULATE                            03
     118C 36 01 282D            952          A     P1200,XR1            FIRST EXPECTED                     02
     1190 34 01 292A            953          ST    WORKN-2,XR1            DDDR RESIDUAL                    02
                                954 *
     1194 36 01 2823            955          A     P80,XR1            CALCULATE SECOND                     02
     1198 34 01 292C            956          ST    WORKN,XR1            EXPECTED DDDR RESIDUAL             02
                                957 *                                                                  02
     119C 0D 01 2912 292A       958          CLC   RDDDR(2),WORKN-2   GO TO RE-LOAD MICROCODE IF           02
     11A2 C0 81 11C1            959          BE    ROFC                 FIRST RESIDUAL DDDR IS CORRECT     03
                                960 *                                                                  02
     11A6 0D 01 2912 292C       961          CLC   RDDDR(2),WORKN     GO TO RE-LOAD MICROCODE IF           02
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
    11AC C0 81 11C1                962       BE    ROFC                  SECOND RESID DDDR IS CORRECT    03
                                   963 *                                                                 03
    11B0 3C F1 27EE                964       MVI   EM30A,C'1'            SET UP FOR ERROR CODE 2031      03
                                   965 *                                                                 03
    11B4 0D 01 2912 2849           966       CLC   RDDDR(2),DDDR         JUMP IF NO DATA                 03
    11BA F2 81 04                  967       JE    ROFC                    TRANSFER TOOK PLACE           03
                                   968 *                                                                 03
    11BD 3C F2 27EE                969       MVI   EM30A,C'2'            SET UP FOR ERROR CODE 2032      03
                                   970 *                                                                 03
    11C1 3D 00 27EE                971 ROFC  CLI   EM30A,0               GO TO TERMINATE IF              03
    11C5 F2 81 14                  972       JE    RELOAD                  NO ERROR CODE SET UP          03
                                   973 *
    11C8 C0 87 212E                974       B     REGRST                RESET ATTACHMENT REGISTERS      03
                                   975 *
    11CC C0 87 021A                976       B     PRINT                 PRINT
    11D0 C6                   11D0 977       DC    XL1'C6'                 ERROR 203X MESSAGE            03
    11D1 1B                   11D1 978       DC    AL1(EM30N-EM30+1)
    11D2 2801                 11D3 979       DC    AL2(EM30N)
    11D4 C101                 11D5 980       DC    AL2(HLT01)
                                   981 *
    11D6 C0 87 0222                982       B     HALT                  ERROR                           03
    11DA C101                 11DB 983       DC    AL2(HLT01)              HALT 01
                                   984 *
    11DC 0D 00 0232 0A00           985 RELOAD CLC  UTAB(1),PID-1         RE-LOAD MICROCODE IF
    11E2 C0 81 2072                986       BE    MPL                     RUNNING FROM 3340
                                   987 *
    11E6 C0 87 022A                988 NORMN B     LOAD                  TERMINATE SECTION
    11EA 00                   11EA 989       DC    XL1'00'
                                   990 *
```



```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                                   992 ***********************************************************************
                                   993 *                                                                     *
                                   994 *             ROUTINE 10 - CE CYLINDER RESTORE                        *
                                   995 *                                                                     *
                                   996 ***********************************************************************
                                   997 *
    11EB 10                   11EB 998 RTN10  DC    XL1'10'              ROUTINE NUMBER
    11EC 00                   11EC 999        DC    XL1'00'              ROUTINE FLAGS
    11ED 12A5                 11EE 1000       DC    AL2(RTN11)           ADDRESS OF NEXT ROUTINE          03
                                   1001 *
    11EF 3C 00 1225                1002 R10   MVI   R10B1,0              INITIALIZE HEAD ADDRESS
                                   1003 *
    11F3 C0 87 13B2                1004       B     BEGIN                PERFORM ROUTINE INITIALIZATION
    11F7 11FB                 11F8 1005       DC    AL2(R10A)            'LOOP' SUBROUTINE RETURN ADDRESS
    11F9 128E                 11FA 1006       DC    AL2(R10F)            'NXDRV' SUBROUTINE RETURN ADDRESS
                                   1007 *
    11FB 3D FF 2904                1008 R10A  CLI   ADRTBL+2,X'FF'       ALLOW ONLY ONE
    11FF F2 81 17                  1009       JE    R10B                   DRIVE TO BE SELECTED
                                   1010 *
    1202 F3 C4 7E                  1011       SIO   X'7E',X'C4'          RESET AND DISABLE 3340 INTERRUPTS
                                   1012 *
    1205 C0 87 021A                1013       B     PRINT                    PRINT MESSAGE
    1209 46                   1209 1014       DC    XL1'46'                    SELECT DRIVE
    120A 50                   120A 1015       DC    AL1(MSGOAN-MSGOA+1)           TO BE INITIALIZED
    120B 22FC                 120C 1016       DC    AL2(MSGOAN)
    120D C1F4                 120E 1017       DC    AL2(HLTE4)
                                   1018 *
    120F C0 87 0222                1019       B     HALT                 UNCONDITIONAL HALT E4
    1213 C1E4                 1214 1020       DC    AL2(HLTE4)
                                   1021 *
    1215 C0 87 11EF                1022       B     R10                  RESTART ROUTINE
                                   1023 *
    1219 C0 87 1597                1024 R10B  B     RECAL                RECALIBRATE
    121D C0 87 1863                1025       B     RDSNS                DETERMINE DATA MODULE SIZE
                                   1026 *
    1221 C0 87 15BB                1027       B     SEEK                 SEEK (3340 PHYSICAL ADDRESS)
    1225                      1225 1028 R10B1 DS    IL1                    HEAD 0 - 11
    1226 015D                 1227 1029       DC    IL2'349'               CYLINDER 349
                                   1030 *
    1228 31 C5 287B                1031       LIO   CEMODE,X'C5'         SET X REG WRHA PREQ OVERRIDE     03
    122C 31 C5 285E                1032       LIO   SVPREQ,X'C5'         SET UP SVP REQUEST               03
    1230 C0 87 18A7                1033       B     WRHAE                WRITE EVEN HOME ADDRESS          03
                                   1034 *                                                                03
    1234 31 C5 287B                1035       LIO   CEMODE,X'C5'         SET X REG WRHA PREQ OVERRIDE     03
    1238 31 C5 285E                1036       LIO   SVPREQ,X'C5'         SET UP SVP REQUEST               03
    123C C0 87 18BA                1037       B     WRHAO                WRITE ODD HOME ADDRESS           03
                                   1038 *
    1240 8C 02 14 281D             1039       MVC   DL(3,XR2),P8         SETUP R0
    1245 0C 07 287F 280B           1040       MVC   DDDF+7(8),NULLS        KL, DL, AND DATA
                                   1041 *
    124B C0 87 1906                1042       B     WRCKD                WRITE COUNT-KEY-DATA
    124F 00                   124F 1043       DC    IL1'0'                 RECORD ZERO (EVEN)
    1250 00                   1250 1044       DC    IL1'0'                 NN = 00
                                   1045 *
    1251 C0 87 1741                1046       B     RDCKD                READ COUNT-KEY-DATA
    1255 00                   1255 1047       DC    IL1'0'                 RECORD ZERO (EVEN)
                                   1048 *
    1256 C0 87 18DB                1049       B     WR0O                 WRITE CNT-KEY-DATA RECORD ZERO ODD
                                   1050 *
    125A C0 87 16FF                1051       B     RDR0O                READ KEY-DATA RECORD ZERO ODD
                                   1052 *
    125E 35 01 290E                1053       L     IDDDR,XR1            POINT TO DDDF AREA
    1262 0C 01 292C 2827           1054       MVC   WORKN(2),P256        SETUP BYTE COUNTER
                                   1055 *
    1268 4C 03 03 2839             1056 R10E1 MVC   3(4,XR1),WCPTN       MOVE WORST
    126D D2 01 04                  1057       LA    4(,XR1),XR1            CASE PATTERN
    1270 0F 01 292C 2815           1058       SLC   WORKN(2),P4              TO DDDF AREA
    1276 C0 01 1268                1059       BNZ   R10E1
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1060 *
 127A 8C 02 14 2827      1061          MVC   DL(3,XR2),P256      SET DATA LENGTH TO 256
                         1062 *
 127F C0 87 1906         1063          B     WRCKD              WRITE COUNT-KEY-DATA
 1283 01                 1283 1064     DC    IL1'1'               RECORD 1
 1284 00                 1284 1065     DC    IL1'0'               NN = 00
                         1066 *
 1285 C0 87 1741         1067          B     RDCKD              READ COUNT-KEY-DATA
 1289 01                 1289 1068     DC    IL1'1'               RECORD 1
                         1069 *
 128A C0 87 1496         1070          B     NXDRV              END OF INITIALIZATION FOR ONE TRACK
                         1071 *
 128E 0E 00 1225 280F    1072 R10F     ALC   R10B1(1),P1        INCREMENT HEAD ADDRESS
                         1073 *
 1294 3D 0C 1225         1074          CLI   R10B1,12           LOOP UNTIL ALL
 1298 C0 82 14EE         1075          BL    LOOP                 TRACKS HAVE BEEN INITIALIZED
                         1076 *
 129C 3B 30 020B         1077          SBF   SBYTE3,X'30'       TURN OFF SENSE SW 1A - 1B          03
                         1078 *
 12A0 C0 87 022A         1079          B     LOAD               TERMINATE SECTION                  03
 12A4 00                 12A4 1080     DC    XL1'00'
                         1081 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1083 ********************************************************************************03
                         1084 *                                                                              03
                         1085 *                ROUTINE 11 - LOAD STATE ANALYSIS                              03
                         1086 *                                                                              03
                         1087 ********************************************************************************03
                         1088 *                                                                              03
 12A5 11                 12A5 1089 R11     DC    XL1'11'          ROUTINE NUMBER                            03
 12A6 00                 12A6 1090         DC    XL1'00'          ROUTINE FLAGS                             03
 12A7 FFFF               12A8 1091         DC    XL2'FFFF'        LAST ROUTINE                              03
                         1092 *                                                                              03
 12A9 C0 87 13B2         1093 R11          B     BEGIN            PERFORM ROUTINE INITIALIZATION            03
 12AD 12D5               12AE 1094         DC    AL2(R11A)        'LOOP' SUBROUTINE RETURN ADDRESS          03
 12AF 12D5               12B0 1095         DC    AL2(R11A)        'NXDRV' SUBROUTINE RETURN ADDRESS         03
                         1096 *                                                                              03
 12B1 3D FF 2904         1097              CLI   ADRTBL+2,X'FF'   ALLOW ONLY ONE                            03
 12B5 F2 81 1D           1098              JE    R11A               DRIVE TO BE SELECTED                     03
                         1099 *                                                                              03
 12B8 F3 C4 7E           1100              SIO   X'7E',X'C4'      RESET AND DISABLE INTERRUPTS              03
                         1101 *                                                                              03
 12BB 0C 0D 22CD 249D    1102              MVC   MSGOAB(14),MTEST SET UP PRINT MESSAGE                      03
                         1103 *                                                                              03
 12C1 C0 87 021A         1104              B     PRINT                PRINT MESSAGE                       03
 12C5 46                 12C5 1105         DC    XL1'46'                'SELECT DRIVE                     03
 12C6 50                 12C6 1106         DC    AL1(MSGOAN-MSGOA+1)      TO BE TESTED.'                  03
 12C7 22FC               12C8 1107         DC    AL2(MSGOAN)                                              03
 12C9 C1E4               12CA 1108         DC    AL2(HLTE4)                                               03
                         1109 *                                                                           03
 12CB C0 87 0222         1110              B     HALT             UNCONDITIONAL HALT E4                   03
 12CF C1E4               12D0 1111         DC    AL2(HLTE4)                                               03
                         1112 *                                                                           03
 12D1 C0 87 12A9         1113              B     R11              RESTART ROUTINE                         03
                         1114 *                                                                           03
 12D5 31 C4 2843         1115 R11A         LIO   DGSNSa,X'C4'     LOAD DDDR TO SENSE AREA ADDR            03
                         1116 *                                                                           03
 12D9 2C 00 12E3 02      1117              MVC   R11V+1,DRVADR(1,XR2)   BUILD READ                        03
 12DE 3A 01 12E3         1118              SBN   R11V+1,BIT7              DIAGNOSTIC SENSE COMMAND          03
                         1119 *                                                                           03
 12E2 F3 00 07           1120 R11V         SIO   X'07',*-*        READ DIAGNOSTIC SENSE DATA              03
                         1121 *                                                                           03
 12E5 C1 C2 12E5         1122              TIO   *,X'C2'          LOOP ON ATTACHMENT BUSY                 03
                         1123 *                                                                           03
 12E9 38 10 296D         1124              TBN   DGSNS+7,BIT3     GO TO TERMINATE SECTION IF              03
 12ED 39 E0 296D         1125              TBF   DGSNS+7,X'E0'      DIAG SENSE BYTE 7 IS NOT              03
 12F1 F2 90 B5           1126              JF    R11U                 EQUAL TO 1X                         03
                         1127 *                                                                           03
 12F4 C2 01 297E         1128 R11B         LA    ACTABL,XR1       LOAD AC TABLE ADDRESS IN XR1            03
                         1129 *                                                                           03
 12F8 0C 00 2939 296F    1130 R11M         MVC   TAG83,DGSNS+9    MOVE DIAGNOSTIC                         03
 12FE 0C 00 2937 2970    1131              MVC   TAG43,DGSNS+10     SENSE DATA                            03
 1304 0C 00 2938 2971    1132              MVC   TAG23,DGSNS+11       INTO                                03
 130A 0C 00 2936 2976    1133              MVC   TAG13,DGSNS+16         TAG BYTES                         03
                         1134 *                                                                           03
 1310 0C 02 292C 2939    1135 R11T         MVC   WORKN(3),TAG83   REPLENISH WORK AREA                      03
                         1136 *                                                                           03
 1316 1C 00 1326 01      1137              MVC   R11P+1,1(1,XR1) SET UP                                   03
 131B 1C 00 132A 02      1138              MVC   R11Q+1,2(1,XR1)   SBF                                    03
 1320 1C 00 132E 03      1139              MVC   R11R+1,3(1,XR1)     INSTRUCTIONS                         03
                         1140 *                                                                           03
 1325 3B 00 292A         1141 R11P         SBF   WORKN-2,*-*      INITIALIZE                              03
 1329 3B 00 292B         1142 R11Q         SBF   WORKN-1,*-*        WORK                                  03
 132D 3B 00 292C         1143 R11R         SBF   WORKN,*-*            AREA                                03
                         1144 *                                                                           03
 1331 7D 0F 00           1145              CLI   0(,XR1),X'0F'    GO TO TERMINATE SECTION IF              03
 1334 C0 81 13A9         1146              BE    R11U               DEFAULT CODE REACHED                  03
                         1147 *                                                                           03
 1338 1D 02 292C 06      1148              CLC   WORKN,6(3,XR1)   JUMP IF ERROR                           03
 133D F2 81 07           1149              JE    R11S               CODE MATCH                            03
                         1150 *                                                                           03
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1340 D2 01 07              1151          LA    7(,XR1),XR1       INCREMENT POINTER IN TABLE
                              1152 *
   1343 C0 87 1310            1153          B     R11T              LOOP UNTIL MATCH OR DEFAULT
                              1154 *
   1347 1C 00 2935 00         1155 R11S     MVC   CODE,J(1,XR1)     SET UP CODE FOR PRINTOUT
                              1156 *
   134C C0 87 021E            1157          B     UNPACK            UNPACK
   1350 01                1350 1158          DC    XL1'1'              AC
   1351 2935              1352 1159          DC    AL2(CODE)             CODE
   1353 234F              1354 1160          DC    AL2(MSG10N)
                              1161 *
   1355 C0 87 021E            1162          B     UNPACK            UNPACK
   1359 01                1359 1163          DC    XL1'1'              DRIVE
   135A 2939              135B 1164          DC    AL2(TAG83)            CHECKS
   135C 236C              135D 1165          DC    AL2(MSG11N)             BYTE
                              1166 *
   135E C0 87 021E            1167          B     UNPACK            UNPACK
   1362 01                1362 1168          DC    XL1'1'              DM SEQUENCE
   1363 2937              1364 1169          DC    AL2(TAG43)            CONTROL
   1365 2389              1366 1170          DC    AL2(MSG12N)             BYTE
                              1171 *
   1367 C0 87 021E            1172          B     UNPACK            UNPACK
   136B 01                136B 1173          DC    XL1'1'              LOAD SWITCH
   136C 2938              136D 1174          DC    AL2(TAG23)            STATUS
   136E 23A6              136F 1175          DC    AL2(MSG13N)             BYTE
                              1176 *
   1370 C0 87 021E            1177          B     UNPACK            UNPACK
   1374 01                1374 1178          DC    XL1'1'              ACCESS CONTROL
   1375 2936              1376 1179          DC    AL2(TAG13)            STATUS
   1377 23C3              1378 1180          DC    AL2(MSG14N)             BYTE
                              1181 *
   1379 C0 87 021A            1182          B     PRINT             PRINT
   137D C1                137D 1183          DC    XL1'C1'             FIRST
   137E 1E                137E 1184          DC    AL1(MSG10N-MSG10+1)   LINE OF
   137F 234F              1380 1185          DC    AL2(MSG10N)             MESSAGE
   1381 C101              1382 1186          DC    AL2(HLT01)
                              1187 *
   1383 C0 87 021A            1188          B     PRINT             PRINT
   1387 81                1387 1189          DC    XL1'81'             SECOND
   1388 1D                1388 1190          DC    AL1(MSG11N-MSG11+1)   LINE OF
   1389 236C              138A 1191          DC    AL2(MSG11N)             MESSAGE
                              1192 *
   138B C0 87 021A            1193          B     PRINT             PRINT
   138F 81                138F 1194          DC    XL1'81'             THIRD
   1390 1D                1390 1195          DC    AL1(MSG12N-MSG12+1)   LINE OF
   1391 2389              1392 1196          DC    AL2(MSG12N)             MESSAGE
                              1197 *
   1393 C0 87 021A            1198          B     PRINT             PRINT
   1397 81                1397 1199          DC    XL1'81'             FOURTH
   1398 1D                1398 1200          DC    AL1(MSG13N-MSG13+1)   LINE OF
   1399 23A6              139A 1201          DC    AL2(MSG13N)             MESSAGE
                              1202 *
   139B C0 87 021A            1203          B     PRINT             PRINT
   139F 85                139F 1204          DC    XL1'85'             FIFTH
   13A0 1D                13A0 1205          DC    AL1(MSG14N-MSG14+1)   LINE OF
   13A1 23C3              13A2 1206          DC    AL2(MSG14N)             MESSAGE
                              1207 *
   13A3 C0 87 0222            1208          B     HALT              ERROR HALT 01
   13A7 C101              13A8 1209          DC    AL2(HLT01)
                              1210 *
   13A9 3B 30 020B            1211 R11U     SBF   SBYTE3,X'30'       TURN OFF SENSE SW 1A - 1B
                              1212 *
   13AD C0 87 022A            1213          B     LOAD              TERMINATE
   13B1 00                13B1 1214          DC    XL1'0'              SECTION
                              1215 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

03                            1217 ********************************************************************************
03                            1218 *                                                                              *
03                            1219 *              INITIALIZATION AND LOOP CONTROL SUBROUTINES                     *
03                            1220 *                                                                              *
03                            1221 ********************************************************************************
03                            1222 *
03                            1223 *              ROUTINE INITIALIZATION
03                            1224 *
03 13B2 34 08 292C            1225 BEGIN    ST    WORKN,ARR           POINT TO SUBROUTINE
03 13B6 35 01 292C            1226          L     WORKN,XR1             CALL PARAMETERS
03                            1227 *
03 13BA 1C 01 1534 01         1228          MVC   LOOPX+3(2),1(,XR1)  SETUP 'LOOP' SUBROUTINE RETURN
03 13BF 1C 01 14ED 03         1229          MVC   NXDRVX+3(2),3(,XR1) SETUP 'NXDRV' SUBROUTINE RETURN
03                            1230 *
03 13C4 D2 01 01 04           1231          LA    4(,XR1),XR1         SETUP 'BEGIN'
03 13C7 34 01 1495            1232          ST    BGNX+3,XR1            SUBROUTINE RETURN
03                            1233 *
03 13CB F3 C4 7E              1234 BGN01    SIO   X'7E',X'C4'         RESET AND DISABLE 3340 INTRPS
03                            1235 *
03 13CE 38 01 0A19            1236          TBN   COM,AMOPSW          BRANCH IF AMOP
03 13D2 C0 10 201C            1237          BT    AMOPLK                WAS ABNORMALLY TERMINATED
03                            1238 *
03 13D6 38 20 0A19            1239          TBN   COM,MPLFLG          LOAD MICROCODE
03 13DA C0 90 2072            1240          BF    MPL                   IF REQUIRED
03                            1241 *
03 13DE 31 C5 287B            1242          LIO   CEMODE,X'C5'        SET CE MODE
03 13E2 31 C5 285E            1243          LIO   SVPREQ,X'C5'          INDICATORS
03                            1244 *
03 13E6 3C 00 28E4            1245          MVI   IND,0               RESET PROGRAM INDICATORS
03 13EA 3C 00 28E5            1246          MVI   IND2,0              RESET PROGRAM INDICATORS      03
03 13EE 3C F0 28FF            1247          MVI   ERRCNT,C'0'         INITIALIZE ERROR RETRY COUNT
03                            1248 *
03 13F2 0C 01 290C 2847       1249          MVC   IDDCR(2),DDCR       INITIALIZE DDCR
03 13F8 0C 01 290E 2849       1250          MVC   IDDDR(2),DDDR         AND DDDR VALUES
03                            1251 *
03 13FE 0C 03 28EB 020D       1252 BGN02    MVC   SSWSV(4),SBYTE5     SAVE SECTION SENSE SWITCHES
03                            1253 *
03 1404 C2 01 2902            1254          LA    ADRTBL,XR1          POINT TO DRV WORK AREA ADDR TBL
03                            1255 *
03 1408 39 10 0208            1256          TBF   SBYTE3,SSW1B                                      02
03 140C 39 40 020A            1257          TBF   SBYTE2,SSW11        BRANCH IF DRIVE 1
03 1410 F2 90 17              1258          JF    BGN03                 TESTING IS INHIBITED
03                            1259 *
03 1413 C2 02 293A            1260          LA    DRVWK1,XR2          STORE DRIVE 1
03 1417 74 02 01              1261          ST    1(,XR1),XR2           WORK AREA ADDRESS IN TABLE
03 141A D2 01 02              1262          LA    2(,XR1),XR1             AND ADVANCE TABLE POINTER
03                            1263 *
03 141D BC 00 00              1264          MVI   DIND(,XR2),0        RESET DRIVE DEPENDENT IND
03                            1265 *
03 1420 38 40 020C            1266          TBN   SBYTE4,SSW21        SKIP IF WRITE
03 1424 F2 90 03              1267          JF    BGN03                 ALLOWED ON DRIVE 1
03                            1268 *
03 1427 BA 08 00              1269          SBN   DIND(,XR2),NOWR     INHIBIT WRITE TESTING
03                            1270 *
03 142A 39 20 0208            1271 BGN03    TBF   SBYTE3,SSW1A                                      02
03 142E 39 20 020A            1272          TBF   SBYTE2,SSW12        BRANCH IF DRIVE 2
03 1432 F2 90 17              1273          JF    BGN06                 TESTING IS INHIBITED
03                            1274 *
03 1435 C2 02 2950            1275          LA    DRVWK2,XR2          STORE DRIVE 2
03 1439 74 02 01              1276          ST    1(,XR1),XR2           WORK AREA ADDRESS IN TABLE
03 143C D2 01 02              1277          LA    2(,XR1),XR1             AND ADVANCE TABLE POINTER
03                            1278 *
03 143F BC 00 00              1279          MVI   DIND(,XR2),0        RESET DRIVE DEPENDENT IND
03                            1280 *
03 1442 38 20 020C            1281          TBN   SBYTE4,SSW22        SKIP IF WRITE
   1446 F2 90 03              1282          JF    BGN06                 ALLOWED ON DRIVE 2
                              1283 *
   1449 BA 08 00              1284          SBN   DIND(,XR2),NOWR     INHIBIT WRITE TESTING
```

C123 3340 FUNCTION TESTS - MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              1285 *
   144C 7C FF 00              1286 BGN05    MVI   0(,XR1),X'FF'      MOVE TERMINATOR TO ADDR TABLE
                              1287 *
   144F C2 01 2902            1288          LA    ADRTBL,XR1         POINT TO START OF ADDRESS TABLE
   1453 34 01 2901            1289          ST    ADRPTR,XR1         INITIALIZE ADDRESS TABLE PTR
   1457 75 02 01              1290          L     1(,XR1),XR2        FIRST DRIVE WK AREA ADDR TO XR2
                              1291 *
   145A 7D FF 00              1292          CLI   0(,XR1),X'FF'      GO TO START TEST IF
   145D F2 01 14              1293          JNE   BGN07                VALID SENSE SW SELECTION
                              1294 *
   1460 C0 87 021A            1295          B     PRINT              PRINT MESSAGE
   1464 46                1464 1296          DC    XL1'46'              INVALID SETTING
   1465 2A                1465 1297          DC    AL1(MSG04N-MSG04+1)    OF SENSE SWITCHES
   1466 21E6              1467 1298          DC    AL2(MSG04N)              11-12 OR 1A-1B        02
   1468 C1E2              1469 1299          DC    AL2(HLTE2)
                              1300 *
   146A C0 87 0222            1301          B     HALT               UNCONDITIONAL HALT E2
   146E C1E2              146F 1302          DC    AL2(HLTE2)
                              1303 *
   1470 C0 87 13FE            1304          B     BGN02              GO TO CHECK SENSE SWS AGAIN
                              1305 *
   1474 BA 40 00              1306 BGN07    SBN   DIND(,XR2),LPSW    SET DRIVE LOOP INDICATOR
                              1307 *
   1477 0C 01 2928 280B       1308          MVC   SNS(2),NULLS       CLEAR SENSE AREA
                              1309 *
   147D 31 C5 284E            1310          LIO   SVPSEQ+1,X'C5'     FORCE
   1481 31 C5 2862            1311          LIO   K+1,X'C5'            ADAPTER CHECK
   1485 31 C5 2864            1312          LIO   RUNMP,X'C5'            TO TEST INTERRUPT ENABLE
                              1313 *
   1489 0D FF 1489 1489       1314          CLC   *(256),*           800 USEC DELAY
                              1315 *
   148F F3 C4 80              1316          SIO   X'80',X'C4'        ENABLE 3340 INTERRUPTS
                              1317 *
   1492 C0 87 0000            1318 BGNX     B     *-*                RETURN TO CALLING ROUTINE
                              1319 *
                              1320 *-------------------------------------------------------------------
                              1321 *              REPEAT TEST ON NEXT DRIVE
                              1322 *
   1496 F3 C4 7E              1323 NXDRV    SIO   X'7E',X'C4'        RESET AND DISABLE 3340 INTRPS
                              1324 *
   1499 3D F0 28FF            1325          CLI   ERRCNT,C'0'        BRANCH IF NO ERROR
   149D F2 81 12              1326          JE    NXD01                RETRIES WERE REQUIRED
                              1327 *
   14A0 0C 00 21F7 28FF       1328          MVC   MSG05+16(1),ERRCNT MOVE RETRY COUNT TO PRINT MSG
                              1329 *
   14A6 C0 87 021A            1330          B     PRINT              PRINT
   14AA 86                14AA 1331          DC    XL1'86'              'RECOVERED
   14AB 19                14AB 1332          DC    AL1(MSG05N-MSG05+1)    AFTER X RETRIES'
   14AC 21FF              14AD 1333          DC    AL2(MSG05N)
                              1334 *
   14AE 3C F0 28FF            1335          MVI   ERRCNT,C'0'        RESET ERROR RETRY COUNTER
                              1336 *
   14B2 35 01 2901            1337 NXD01    L     ADRPTR,XR1         GET ADDRESS TABLE POINTER
                              1338 *
   14B6 7D FF 02              1339          CLI   2(,XR1),X'FF'      BRANCH IF ALL DRIVES
   14B9 F2 81 0E              1340          JE    NXD02                HAVE BEEN TESTED
                              1341 *
   14BC 75 02 03              1342          L     3(,XR1),XR2        POINT TO NEXT DRV WORK AREA
                              1343 *
   14BF D2 01 02              1344          LA    2(,XR1),XR1        ADVANCE ADDRESS
   14C2 34 01 2901            1345          ST    ADRPTR,XR1           TABLE POINTER
                              1346 *
   14C6 C0 87 14EE            1347          B     LOOP               GO TO TEST NEXT DRIVE
                              1348 *
   14CA C2 01 2902            1349 NXD02    LA    ADRTBL,XR1         RE-INITIALIZE
   14CE 34 01 2901            1350          ST    ADRPTR,XR1           ADDRESS TABLE POINTER AND
   14D2 75 02 01              1351          L     1(,XR1),XR2            POINT TO FIRST DRIVE AREA
                              1352 *
```


C123 3340 FUNCTION TESTS - MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   14D5 C0 87 0212            1353          B     TEST               CHECK FOR USER INTERVENTION
                              1354 *
   14D9 3B 40 28E4            1355          TBN   IND,HLTSW          CONTINUE TESTING IF NO
   14DD F2 90 0A              1356          JF    NXDRVX               PERMANENT ERROR OCCURED
                              1357 *
   14E0 C0 87 0222            1358          B     HALT               ERROR HALT
   14E4 C101              14E5 1359          DC    AL2(HLT01)
                              1360 *
   14E6 3B 40 28E4            1361          SBF   IND,HLTSW          RESET PERMANENT ERR INDICATOR
                              1362 *
   14EA C0 87 0000            1363 NXDRVX   B     *-*                RETURN TO CALLING ROUTINE
                              1364 *
                              1365 *-------------------------------------------------------------------
                              1366 *              SETUP TEST LOOP ADDRESS
                              1367 *
   14EE 0C 01 290C 2847       1368 LOOP     MVC   IDDCR(2),DDCR      RE-INITIALIZE
   14F4 0C 01 290E 2849       1369          MVC   IDDDR(2),DDDR        DDCR AND DDDR VALUES
                              1370 *
   14FA 0D 03 28EB 020D       1371          CLC   SSWSV(4),SBYTE5    BRANCH IF ANY
   1500 C0 01 13CB            1372          BNE   BGN01                SECTION SNS SW CHANGES
                              1373 *
   1504 3B 07 28E4            1374          SBF   IND,OPEND+SKEND+SNSAVL RESET INTERRUPT AND
   1508 3B 30 28E4            1375          SBF   IND,INTERR+DRVERR      ERROR INDICATORS
                              1376 *
   150C 0C 01 2928 280B       1377          MVC   SNS(2),NULLS       CLEAR SENSE AREA
                              1378 *
   1512 31 C5 284E            1379          LIO   SVPSEQ+1,X'C5'     FORCE
   1516 31 C5 2862            1380          LIO   K+1,X'C5'            ADAPTER CHECK
   151A 31 C5 2864            1381          LIO   RUNMP,X'C5'            TO TEST INTERRUPT ENABLE
                              1382 *
   151E 0D FF 151E 151E       1383          CLC   *(256),*           800 USEC DELAY
                              1384 *
   1524 F3 C4 80              1385          SIO   X'80',X'C4'        ENABLE 3340 INTERRUPTS
                              1386 *
   1527 B8 40 00              1387          TBN   DIND(,XR2),LPSW    TEST DRIVE LOOP INDICATOR
   152A BA 40 00              1388          SBN   DIND(,XR2),LPSW    RESET INDICATOR
   152D C0 90 1492            1389          BF    BGNX               BRANCH IF IND WAS OFF
                              1390 *
   1531 C0 87 0000            1391 LOOPX    B     *-*                RETURN TO CALLING ROUTINE
                              1392 *
                              1393 *-------------------------------------------------------------------
                              1394 *              ERROR RETRY PROCEDURE
                              1395 *
   1535 F3 C4 7E              1396 RETRY    SIO   X'7E',X'C4'        RESET AND DISABLE 3340 INTRPS
                              1397 *
   1538 30 00 28E7            1398          SNS   SWS,0          * AMOP *  SENSE DATA SWS
   153C 3D 83 28E6            1399          CLI   LINKID,X'83'   * LINK *    AND GO TO AMOP IF
   1540 C0 81 201C            1400          BE    AMOPLK         * '83' *      SWS 1 & 2 CONTAIN '83'
                              1401 *
   1544 3D F0 28FF            1402          CLI   ERRCNT,C'0'        PRINT ERROR
   1548 C0 81 1E12            1403          BE    ERRPRT               MESSAGE IF FIRST ERROR
                              1404 *
   154C 8B C0 00              1405          SBF   DIND(,XR2),LPSW+CEDM RESET DRIVE INDICATORS
                              1406 *
   154F 39 05 2928            1407          TBF   SNS,BIT5+BIT7      FORCE SYSTEM RESET IF
   1553 C0 90 20B7            1408          BF    SYSRST               DM ATTENTION OR ADAPTER CK
                              1409 *
   1557 38 01 2928            1410          TBN   SNS,BIT7           TERMINATE SECTION IF
   155B F2 10 22              1411          JT    ABEND                MICRO-PROCESSOR WON'T START
                              1412 *
   155E 06 00 28FF 280C       1413          AZ    ERRCNT(1),D1(1)    INCREMENT ERROR RETRY COUNT
                              1414 *
   1564 3D F3 28FF            1415          CLI   ERRCNT,C'3'        GO TO RETRY COMMAND SEQUENCE
   1568 C0 04 14EE            1416          BNH   LOOP                 IF COUNT NOT YET EXHAUSTED
                              1417 *
   156C C0 87 021A            1418          B     PRINT                PRINT
   1570 86                1570 1419          DC    XL1'86'                PERMANENT
   1571 1C                1571 1420          DC    AL1(MSG07N-MSG07+1)      ERROR MESSAGE
```

C123 3340 FUNCTION TESTS - MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   1572 224D             1573 1421          DC    AL2(MSG07N)
                              1422 *
   1574 3C F0 28FF            1423          MVI   ERRCNT,C'0'          RESET ERROR RETRY COUNTER
   1578 3A 40 28E4            1424          SBN   IND,HL1SW            SET PERMANENT ERROR INDICATOR
   157C C0 87 1496            1425          S     NXDRV                GO TO TRY NEXT DRIVE
                              1426 *
   1580 C0 87 021A            1427 ABEND    B     PRINT                PRINT
   1584 86               1584 1428          DC    XL1'86'                TERMINATION MESSAGE
   1585 32               1585 1429          DC    AL1(MSG06N-MSG06+1)
   1586 2231             1587 1430          DC    AL2(MSG06N)
                              1431 *
   1588 3B 20 0A19            1432          SBF   COM,MPLFLG           RESET MICRO-PROGRAM LOADED IND
                              1433 *
   158C C0 87 0222            1434          B     HALT                 ERROR HALT 01
   1590 C101             1591 1435          DC    AL2(HLT01)
                              1436 *
   1592 C0 87 022A            1437          B     LOAD                 TERMINATE SECTION
   1596 40               1596 1438          DC    XL1'40'
                              1439 *
```


C123 3340 FUNCTION TESTS - MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              1441 ********************************************************************************
                              1442 *                                                                              *
                              1443 *              3340 COMMAND EXECUTION SUBROUTINES                              *
                              1444 *                                                                              *
                              1445 ********************************************************************************
                              1446 *
                              1447 *              RECALIBRATE COMMAND
                              1448 *
   1597 34 08 16AC            1449 RECAL    ST    SEEKX+3,ARR                SAVE RETURN ADDRESS
                              1450 *
   159B 0C 04 28F0 2413       1451          MVC   CMD(5),MRECAL              SETUP 'CMD' FIELD FOR PRINTOUT
                              1452 *
   15A1 BC 00 06              1453          MVI   Q(,XR2),X'00'              SETUP Q AND R
   15A4 BC 01 07              1454          MVI   R(,XR2),X'01'                BYTES FOR SIO COMMAND
                              1455 *
   15A7 8C 09 15 280B         1456          MVC   NN(10,XR2),NULLS           CLEAR DDCF AREA
                              1457 *
   15AC 0C 06 28F7 240E       1458          MVC   CYL(7),REZERO              SETUP CYLINDER AND
   15B2 0C 04 28FC 240D       1459          MVC   HD(5),REZERO-1               HEAD VALUES FOR PRINTOUTS
                              1460 *
   15B8 F2 87 D2              1461          J     SEEKA                      GO TO EXECUTE COMMAND
                              1462 *
                              1463 *--------------------------------------------------------------------------------
                              1464 *              SEEK COMMAND
                              1465 *
   15BB 34 08 292C            1466 SEEK     ST    WORKN,ARR                  SETUP POINTER TO
   15BF 35 01 292C            1467          L     WORKN,XR1                    SUBRTN CALL PARAMETERS
                              1468 *
   15C3 0C 04 28F0 2418       1469          MVC   CMD(5),MSEEK               SETUP 'CMD' FIELD FOR PRINTOUT
                              1470 *
   15C9 1C 02 292B 02         1471          MVC   WORK+2,2(3,XR1)            MOVE PARAMETERS TO WORK AREA
                              1472 *
   15CE 0C 06 28F7 240E       1473          MVC   CYL(7),REZERO              SETUP CYLINDER AND
   15D4 0C 04 28FC 240D       1474          MVC   HD(5),REZERO-1               HEAD VALUES FOR PRINTOUTS
                              1475 *
   15DA 0E 01 292B 2831       1476 SK00     ALC   WORK+2(2),N1               CONVERT CYLINDER
   15E0 F2 82 0A              1477          JM    SK00A                        ADDRESS TO DECIMAL
   15E3 06 20 28F7 280C       1478          AZ    CYL(3),D1(1)                   AND SAVE FOR PRINTOUTS
   15E9 C0 87 15DA            1479          B     SK00
                              1480 *
   15ED 0E 00 2929 2831       1481 SK00A    ALC   WORK(1),N1                 CONVERT HEAD
   15F3 F2 82 0A              1482          JM    SK00B                        ADDRESS TO DECIMAL
   15F6 06 10 28FC 280C       1483          AZ    HD(2),D1(1)                    AND SAVE FOR PRINTOUTS
   15FC C0 87 15ED            1484          B     SK00A
                              1485 *
   1600 1C 02 292C 02         1486 SK00B    MVC   WORK+3,2(3,XR1)            MOVE PARAMETERS TO WORK AREA
                              1487 *
   1605 3C 0B 2929            1488          MVI   WORK,11                    SETUP MULTIPLIER FOR 12 HEADS
                              1489 *
   1609 B8 80 00              1490          TBN   DIND(,XR2),CEDM            BRANCH IF NOT
   160C F2 90 0B              1491          JF    SK01                         CE DATA MODULE
                              1492 *
   160F 3C 01 2929            1493          MVI   WORK,1                     SETUP MULTIPLIER FOR 2 HEADS
                              1494 *
   1613 7D 01 00              1495          CLI   0(,XR1),1                  BYPASS TEST IF HEAD
   1616 C0 84 1496            1496          BH    NXDRV                        ADDRESS IS GREATER THAN 1
                              1497 *
   161A BC 00 06              1498 SK01     MVI   Q(,XR2),X'00'              SETUP Q AND R
   161D BC 00 07              1499          MVI   R(,XR2),X'00'                BYTES FOR SIO COMMAND
                              1500 *
   1620 8C 09 15 280B         1501          MVC   NN(10,XR2),NULLS           CLEAR DDCF AREA
                              1502 *
   1625 1E 01 292C 02         1503 SK02     ALC   WORK+3,2(2,XR1)            MULTIPLY PHYSICAL
   162A 0F 00 2929 280F       1504          SLC   WORK(1),P1                   CYLINDER ADDRESS
   1630 C0 01 1625            1505          BNZ   SK02                         BY NUMBER OF HEADS
                              1506 *
   1634 0E 01 292C 292A       1507          ALC   WORK+3(2),WORK+1            ADD HEAD ADDRESS
                              1508 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   163A D2 01 03                1509          LA    3(,XR1),XR1
   163D 34 01 16AC              1510          ST    SEEKX+3,XR1
                                1511 *
   1641 C2 01 0000              1512          LA    0,XR1
   1645 OD 01 292C 2821         1513 SK03     CLC   WORK+3(2),P20
   164B F2 82 0D                1514          JL    SK04
   164E D2 01 01                1515          LA    1(,XR1),XR1
   1651 OF 01 292C 2821         1516          SLC   WORK+3(2),P20
   1657 C0 87 1645              1517          B     SK03
                                1518 *
   165B B4 01 0E                1519 SK04     ST    CC(,XR2),XR1
   165E BC 01 10 292C           1520          MVC   HH(,XR2),WORK+3(2)
                                1521 *
   1663 34 01 292A              1522          ST    WORK+1,XR1
                                1523 *
   1667 OE 01 292A 2831         1524 SK05     ALC   WORK+1(2),N1
   166D F2 82 0A                1525          JM    SK06
   1670 06 20 28F3 280C         1526          AZ    CYL-4(3),D1(1)
   1676 C0 87 1667              1527          B     SK05
                                1528 *
   167A OE 01 292C 2831         1529 SK06     ALC   WORK+3(2),N1
   1680 F2 82 0A                1530          JM    SEEKA
   1683 06 20 28F9 280C         1531          AZ    HD-3(3),D1(1)
   1689 C0 87 167A              1532          B     SK06
                                1533 *
   168D C0 87 1A3D              1534 SEEKA    B     XEQ
                                1535 *
   1691 OD 01 290E 2912         1536          CLC   IDDDR(2),RDDDR
   1697 C0 01 1CD9              1537          BNE   ERR16
                                1538 *
   169B OD 09 291C 2926         1539          CLC   IDDCFN(10),RDDCFN
   16A1 C0 01 1CF3              1540          BNE   ERR18
                                1541 *
   16A5 AC 03 08 10             1542          MVC   PA(4,XR2),HH(,XR2)
                                1543 *
   16A9 C0 87 0000              1544 SEEKX    B     *-*
                                1545 *
                                1546 *---------------------------------------------------------
                                1547 *        READ HOME ADDRESS AND RECORD ZERO COUNT EVEN
                                1548 *
   16AD 34 08 16FE              1549 RDHAE    ST    RDHAOX+3,ARR
                                1550 *
   16B1 0C 04 28F0 241D         1551          MVC   CMD(5),MRDHAE
                                1552 *
   16B7 BC 01 06                1553          MVI   Q(,XR2),X'01'
   16BA BC 01 07                1554          MVI   R(,XR2),X'01'
                                1555 *
   16BD F2 87 10                1556          J     RDHAOA
                                1557 *
                                1558 *---------------------------------------------------------
                                1559 *        READ HOME ADDRESS AND RECORD ZERO COUNT ODD
                                1560 *
   16C0 34 08 16FE              1561 RDHAO    ST    RDHAOX+3,ARR
                                1562 *
   16C4 0C 04 28F0 2422         1563          MVC   CMD(5),MRDHAO
                                1564 *
   16CA BC 01 06                1565          MVI   Q(,XR2),X'01'
   16CD BC 09 07                1566          MVI   R(,XR2),X'09'
                                1567 *
   16D0 8C 09 15 280B           1568 RDHAOA   MVC   NN(10,XR2),NULLS
                                1569 *
   16D5 C0 87 1A3D              1570          B     XEQ
                                1571 *
   16D9 2D 03 2921 0B           1572          CLC   RDDCF+4(4),PA(,XR2)
   16DE C0 01 1CF3              1573          BNE   ERR18
                                1574 *
   16E2 35 01 290E              1575          L     IDDDR,XR1
   16E6 9C 08 14 08             1576          MVC   DL(9,XR2),8(,XR1)
```

SETUP
RETURN ADDRESS

DIVIDE BY 20
TO GET CYLINDER
SEEK ARGUMENT IN
INDEX REGISTER 1 AND
HEAD SEEK ARGUMENT
IN WORK AREA

STORE SEEK
ARGUMENT IN DDCF

MOVE CYL ADDRESS TO WORK AREA

CONVERT CYLINDER
ADDRESS TO DECIMAL
AND SAVE FOR PRINTOUTS

CONVERT HEAD
ADDRESS TO DECIMAL
AND SAVE FOR PRINTOUTS

GO TO EXECUTE COMMAND

GO TO ERROR END IF
RESIDUAL DDDR IS INCORRECT

GO TO ERROR END IF
RESIDUAL DDCF IS INCORRECT

SAVE CURRENT PHYSICAL ADDRESS

RETURN TO CALLING ROUTINE

SAVE RETURN ADDRESS

SETUP 'CMD' FIELD FOR PRINTOUT

SETUP Q AND R
BYTES FOR SIO COMMAND

GO TO EXECUTE COMMAND

SAVE RETURN ADDRESS

SETUP 'CMD' FIELD FOR PRINTOUT

SETUP Q AND R
BYTES FOR SIO COMMAND

CLEAR DDCF AREA

GO TO EXECUTE COMMAND

GO TO ERROR EXIT IF
HA READ IS INCORRECT

SAVE RESIDUAL DDDF
FOR USE IN NEXT DDCF


```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                1577 *
   16EA D2 01 09                1578          LA    9(,XR1),XR1
   16ED 34 01 292C              1579          ST    WORKN,XR1
                                1580 *
   16F1 OD 01 292C 2912         1581          CLC   WORKN(2),RDDDR
   16F7 C0 01 1CD9              1582          BNE   ERR16
                                1583 *
   16FB C0 87 0000              1584 RDHAOX   B     *-*
                                1585 *
                                1586 *---------------------------------------------------------
                                1587 *        READ RECORD ZERO KEY-DATA ODD
                                1588 *
   16FF 34 08 1740              1589 RDR00    ST    RDR00X+3,ARR
                                1590 *
   1703 0C 04 28F0 2427         1591          MVC   CMD(5),MRDR00
                                1592 *
   1709 BC 01 06                1593          MVI   Q(,XR2),X'01'
   170C BC 08 07                1594          MVI   R(,XR2),X'08'
                                1595 *
   170F BC 00 11                1596          MVI   RR(,XR2),0
   1712 BC 00 15                1597          MVI   NN(,XR2),0
                                1598 *
   1715 C0 87 1A3D              1599          B     XEQ
                                1600 *
   1719 8D 08 14 2925           1601 RDR00A   CLC   DL(9,XR2),RDDCF+8
   171E C0 01 1CF3              1602          BNE   ERR18
                                1603 *
   1722 BC 00 11                1604          MVI   RR(,XR2),0
                                1605 *
   1725 35 01 290E              1606          L     IDDDR,XR1
   1729 B6 01 12                1607          A     KL(,XR2),XR1
   172C B6 01 14                1608          A     DL(,XR2),XR1
   172F 34 01 292C              1609          ST    WORKN,XR1
                                1610 *
   1733 OD 01 292C 2912         1611          CLC   WORKN(2),RDDDR
   1739 C0 01 1CD9              1612          BNE   ERR16
                                1613 *
   173D C0 87 0000              1614 RDR00X   B     *-*
                                1615 *
                                1616 *---------------------------------------------------------
                                1617 *        READ COUNT-KEY-DATA
                                1618 *
   1741 34 08 1740              1619 RDCKD    ST    RDR00X+3,ARR
                                1620 *
   1745 0C 04 28F0 242C         1621          MVC   CMD(5),MRDCKD
                                1622 *
   174B BC 01 06                1623          MVI   Q(,XR2),X'01'
   174E BC 02 07                1624          MVI   R(,XR2),X'02'
                                1625 *
   1751 8C 03 15 280B           1626          MVC   NN(4,XR2),NULLS
                                1627 *
   1756 35 01 1740              1628          L     RDR00X+3,XR1
   175A 9C 00 11 00             1629          MVC   RR(1,XR2),0(,XR1)
                                1630 *
   175E C0 87 1A3D              1631          B     XEQ
                                1632 *
   1762 8C 02 14 2925           1633          MVC   DL(3,XR2),RDDCF+8
                                1634 *
   1767 0E 01 1740 280F         1635          ALC   RDR00X+3(2),P1
                                1636 *
   176D C0 87 1719              1637          B     RDR00A
                                1638 *
                                1639 *---------------------------------------------------------
                                1640 *        READ COUNT-KEY-DATA DIAGNOSTIC
                                1641 *
   1771 34 08 1740              1642 RDDGN    ST    RDR00X+3,ARR
                                1643 *
   1775 0C 04 28F0 2431         1644          MVC   CMD(5),MRDDGN
```

CALCULATE EXPECTED
RESIDUAL DDDR

GO TO ERROR END IF
RESIDUAL DDDR IS INCORRECT

RETURN TO CALLING ROUTINE

SAVE RETURN ADDRESS

SETUP 'CMD' FIELD FOR PRINTOUT

SETUP Q AND R
BYTES FOR SIO COMMAND

CLEAR DDCF RR FIELD
CLEAR DDCF NN FIELD

GO TO EXECUTE COMMAND

GO TO ERROR END IF
RESIDUAL DDCF IS INCORRECT

CLEAR RR FIELD

CALCULATE
EXPECTED
RESIDUAL DDDR

GO TO ERROR END IF
RESIDUAL DDDR IS INCORRECT

RETURN TO CALLING ROUTINE

SAVE RETURN ADDRESS

SETUP 'CMD' FIELD FOR PRINTOUT

SETUP Q AND R
BYTES FOR SIO COMMAND

CLEAR KL, DL, AND NN FIELDS 03

MOVE RECORD
NUMBER TO DDCF

GO TO EXECUTE COMMAND

SAVE KEY AND DATA LENGTHS READ

SETUP RETURN ADDRESS

GO TO CHECK RESIDUAL VALUES

SAVE RETURN ADDRESS

SETUP 'CMD' FIELD FOR PRINTOUT

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1645 *
                         1646          MVI   Q(,XR2),X'01'        SETUP Q AND R
                         1647          MVI   R(,XR2),X'04'          BYTES FOR SIO COMMAND
                         1648 *
                         1649          MVI   NN(,XR2),0           CLEAR NN FIELD
                         1650 *
 177B BC 01 06           1651          L     RDR00X+3,XP1         MOVE RECORD
 177E BC 04 07           1652          MVC   RR(1,XR2),0(,XR1)      NUMBER TO DDCF
                         1653 *
 1781 BC 00 15           1654          B     XEQ                  GO TO EXECUTE COMMAND
                         1655 *
 1784 35 01 1740         1656          ALC   RDR00X+3(2),P1       SETUP RETURN ADDRESS
 1788 9C 00 11 00        1657 *
                         1658          B     RDR00A               GO TO CHECK RESIDUAL VALUES
                         1659 *----------------------------------------------------------------
                         1660 *                READ KEY-DATA
                         1661 *
 178C C0 87 1A3D         1662 *
 1790 0E 01 1740 280F    1663 RDKD     ST    RDKDX+3,ARR          SAVE RETURN ADDRESS
 1796 C0 87 1719         1664 *
                         1665          MVC   CMD(5),MRDKD         SETUP 'CMD' FIELD FOR PRINTOUT
                         1666 *
                         1667          MVI   Q(,XR2),X'01'        SETUP Q AND R
                         1668          MVI   R(,XR2),X'00'          BYTES FOR SIO COMMAND
                         1669 *
 179A 34 08 17FC         1670 RDKDA    L     RDKDX+3,XR1          MOVE RECORD
 179E 0C 04 28F0 2436    1671          MVC   RR(1,XR2),0(,XR1)      NUMBER AND NN
                         1672          MVC   NN(1,XR2),1(,XR1)        VALUE TO DDCF
                         1673 *
 17A4 BC 01 06           1674          B     XEQ                  GO TO EXECUTE COMMAND
 17A7 BC 00 07           1675 *
                         1676          ALC   RR(1,XR2),NN(,XR2)   CALCULATE EXPECTED RESIDUAL RR
                         1677 *
 17AA 35 01 17FC         1678          CLI   RDDCF+9,X'FF'        GO TO
 17AE 9C 00 11 00        1679          BNE   ERR18                  ERROR END
 17B2 9C 00 15 01        1680          CLC   DL(9,XR2),RDDCF+8        IF RESIDUAL
                         1681          BNE   ERR18                      DDCF IS INCORRECT
                         1682 *
 17B6 C0 87 1A3D         1683          MVI   RR(,XR2),0           CLEAR RR FIELD
                         1684 *
 17BA AE 00 11 15        1685          L     IDDDR,XR1            CALCULATE
 17BE 3D FF 2926         1686 RDKDB    A     KL(,XR2),XR1           EXPECTED
 17C2 C0 01 1CF3         1687          A     DL(,XR2),XR1             RESIDUAL
 17C6 8D 08 14 2925      1688          ALC   NN(1,XR2),N1               DDDR VALUE
 17CB C0 01 1CF3         1689          BNM   RDKDB
                         1690 *
 17CF BC 00 11           1691          ST    WORKN,XR1            GO TO ERROR
                         1692          CLC   WORKN(2),RDDDR         END IF RESIDUAL
 17D2 35 01 290E         1693          BNE   ERR16                    DDDR IS INCORRECT
 17D6 B6 01 12           1694 *
 17D9 B6 01 14           1695          ALC   RDKDX+3(2),P2        SETUP RETURN ADDRESS
 17DC 8E 00 15 2831      1696 *
 17E1 C0 02 17D6         1697 RDKDX    B     *-*                  RETURN TO CALLING ROUTINE
                         1698 *
 17E5 34 01 292C         1699 *----------------------------------------------------------------
 17E9 0D 01 292C 2912    1700 *                READ VERIFY KEY-DATA
 17EF C0 01 1CD9         1701 *
                         1702 RDVKD    ST    RDVKDX+3,ARR         SAVE RETURN ADDRESS
 17F3 0E 01 17FC 2811    1703 *
                         1704          MVC   CMD(5),MRDVKD        SETUP 'CMD' FIELD FOR PRINTOUT
 17F9 C0 87 0000         1705 *
                         1706          MVI   Q(,XR2),X'01'        SETUP Q AND R
                         1707          MVI   R(,XR2),X'03'          BYTES FOR SIO COMMAND
                         1708 *
 17FD 34 08 184A         1709          MVC   DL(3,XR2),NULLS      CLEAR KL AND DL FIELDS
                         1710 *
 1801 0C 04 28F0 243B    1711          L     RDVKDX+3,XR1         MOVE RECORD
 1807 BC 01 06           1712          MVC   RR(1,XR2),0(,XR1)      NUMBER AND NN
 180A BC 03 07
 180D 8C 02 14 280B
 1812 35 01 184A
 1816 9C 00 11 00
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 181A 9C 00 15 01        1713          MVC   NN(1,XR2),1(,XR1)      VALUE TO DDCF
                         1714 *
 181E C0 87 1A3D         1715          B     XEQ                  GO TO EXECUTE COMMAND
                         1716 *
 1822 AE 00 11 15        1717          ALC   RR(1,XR2),NN(,XR2)   CALCULATE EXPECTED RESIDUAL RR
                         1718 *
 1826 3D FF 2926         1719          CLI   RDDCF+9,X'FF'        GO TO
 182A C0 01 1CF3         1720          BNE   ERR18                  ERROR END
 182E 8D 05 11 2922      1721          CLC   RR(6,XR2),RDDCF+5        IF RESIDUAL
 1833 C0 01 1CF3         1722          BNE   ERR18                      DDCF IS INCORRECT
                         1723 *
 1837 0D 01 290E 2912    1724          CLC   IDDDR(2),RDDDR       GO TO ERROR END IF
 183D C0 01 1CD9         1725          BNE   ERR16                  RESIDUAL DDDR IS INCORRECT
                         1726 *
 1841 0E 01 184A 2811    1727          ALC   RDVKDX+3(2),P2       SETUP RETURN ADDRESS
 1847 C0 87 0000         1728 *
                         1729 RDVKDX   B     *-*                  RETURN TO CALLING ROUTINE
                         1730 *
                         1731 *----------------------------------------------------------------
                         1732 *                READ AND RESET BUFFERED LOG
                         1733 *
 184B 34 08 18A6         1734 RDLOG    ST    RDSNSX+3,ARR         SAVE RETURN ADDRESS
                         1735 *
 184F 0C 04 28F0 2440    1736          MVC   CMD(5),MRDLOG        SETUP 'CMD' FIELD FOR PRINTOUT
                         1737 *
 1855 BC 01 06           1738          MVI   Q(,XR2),X'01'        SETUP Q AND R
 1858 BC 05 07           1739          MVI   R(,XR2),X'05'          BYTES FOR SIO COMMAND
                         1740 *
 185B C0 87 1A3D         1741          B     XEQ                  GO TO EXECUTE COMMAND
                         1742 *
 185F C0 87 1884         1743          B     RDSNSA               GO TO CHECK RESIDUAL VALUES
                         1744 *
                         1745 *----------------------------------------------------------------
                         1746 *                READ DIAGNOSTIC SENSE DATA
                         1747 *
 1863 34 08 18A6         1748 RDSNS    ST    RDSNSX+3,ARR         SAVE RETURN ADDRESS
                         1749 *
 1867 0C 04 28F0 2445    1750          MVC   CMD(5),MRDSNS        SETUP 'CMD' FIELD FOR PRINTOUT
                         1751 *
 186D BC 01 06           1752          MVI   Q(,XR2),X'01'        SETUP Q AND R
 1870 BC 07 07           1753          MVI   R(,XR2),X'07'          BYTES FOR SIO COMMAND
                         1754 *
 1873 C0 87 1A3D         1755          B     XEQ                  GO TO EXECUTE COMMAND
                         1756 *
 1877 35 01 290E         1757          L     IDDDR,XR1            SET INDICATOR
 187B 79 02 02           1758          TBF   2(,XR1),BIT6           IF SENSE DATA
 187E F2 90 03           1759          JF    RDSNSA                   INDICATES THAT A CE
 1881 BA 80 00           1760          SBN   DIND(,XR2),CEDM            DATA MODULE IS MOUNTED
                         1761 *
 1884 35 01 290E         1762 RDSNSA   L     IDDDR,XR1            CALCULATE
 1888 D2 01 18           1763          LA    24(,XR1),XR1           EXPECTED
 188B 34 01 292C         1764          ST    WORKN,XR1                RESIDUAL DDDR
                         1765 *
 188F 0D 01 292C 2912    1766          CLC   WORKN(2),RDDDR       GO TO ERROR END IF
 1895 C0 01 1CD9         1767          BNE   ERR16                  RESIDUAL DDDR IS INCORRECT
                         1768 *
 1899 0D 09 291C 2926    1769          CLC   IDDCFN(10),RDDCFN    GO TO ERROR END IF
 189F C0 01 1CF3         1770          BNE   ERR18                  RESIDUAL DDCF IS INCORRECT
                         1771 *
 18A3 C0 87 0000         1772 RDSNSX   B     *-*                  RETURN TO CALLING ROUTINE
                         1773 *
                         1774 *----------------------------------------------------------------
                         1775 *                WRITE HOME ADDRESS AND RECORD ZERO COUNT EVEN
                         1776 *
 18A7 34 08 1905         1777 WRHAE    ST    WRR00X+3,ARR         SAVE RETURN ADDRESS
                         1778 *
 18AB 0C 04 28F0 244F    1779          MVC   CMD(5),MWRHAE        SETUP 'CMD' FIELD FOR PRINTOUT
                         1780 *
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   18B1 BC 02 06             1781          MVI   Q(,XR2),X'02'          SETUP Q AND R
   18B4 BC 01 07             1782          MVI   R(,XR2),X'01'            BYTES FOR SIO COMMAND
                             1783 *
   18B7 F2 87 10             1784          J     WRHAOA                   GO TO EXECUTE COMMAND
                             1785 *
                             1786 *-------------------------------------------------------------------
                             1787 *              WRITE HOME ADDRESS AND RECORD ZERO COUNT ODD
                             1788 *
   18BA 34 08 1905           1789 WRHAO    ST    WRR00X+3,ARR             SAVE RETURN ADDRESS
                             1790 *
   18BE 0C 04 28F0 2454      1791          MVC   CMD(5),MWRHAO            SETUP 'CMD' FIELD FOR PRINTOUT
                             1792 *
   18C4 BC 02 06             1793          MVI   Q(,XR2),X'02'            SETUP Q AND R
   18C7 BC 09 07             1794          MVI   R(,XR2),X'09'              BYTES FOR SIO COMMAND
                             1795 *
   18CA 8C 08 15 280B        1796 WRHAOA   MVC   NN(9,XR2),NULLS           CLEAR DDCF AREA
   18CF AC 03 10 0B          1797          MVC   HH(4,XR2),PA(,XR2)         MOVE PHYSICAL ADDRESS TO DDCF
   18D3 8C 02 14 281D        1798          MVC   DL(3,XR2),P8               MOVE RO KL & DL TO DDCF
                             1799 *
   18D8 F2 87 10             1800          J     WRR00A                   GO TO EXECUTE COMMAND
                             1801 *
                             1802 *-------------------------------------------------------------------
                             1803 *              WRITE RECORD ZERO KEY-DATA ODD
                             1804 *
   18DB 34 08 1905           1805 WRR00    ST    WRR00X+3,ARR             SAVE RETURN ADDRESS
                             1806 *
   18DF 0C 04 28F0 2459      1807          MVC   CMD(5),MWRR00            SETUP 'CMD' FIELD FOR PRINTOUT
                             1808 *
   18E5 BC 02 06             1809          MVI   Q(,XR2),X'02'            SETUP Q AND R
   18E8 BC 06 07             1810          MVI   R(,XR2),X'06'              BYTES FOR SIO COMMAND
                             1811 *
   18EB C0 87 1A3D           1812 WRR00A   B     XEQ                      GO TO EXECUTE COMMAND
                             1813 *
   18EF 8D 08 14 2925        1814          CLC   DL(9,XR2),RDDCF+8        GO TO ERROR END IF
   18F4 C0 01 1CF3           1815          BNE   ERR18                      RESIDUAL DDCF IS INCORRECT
                             1816 *
   18F8 0D 01 290E 2912      1817          CLC   IDDDR(2),RDDDR           GO TO ERROR END IF
   18FE C0 01 1CD9           1818          BNE   ERR16                      RESIDUAL DDDR IS INCORRECT
                             1819 *
   1902 C0 87 0000           1820 WRR00X   B     *-*                      RETURN TO CALLING ROUTINE
                             1821 *
                             1822 *-------------------------------------------------------------------
                             1823 *              WRITE COUNT-KEY-DATA
                             1824 *
   1906 34 08 1949           1825 WRCKD    ST    WRCKDX+3,ARR             SAVE RETURN ADDRESS
                             1826 *
   190A 0C 04 28F0 245E      1827          MVC   CMD(5),MWRCKD            SETUP 'CMD' FIELD FOR PRINTOUT
                             1828 *
   1910 BC 02 06             1829          MVI   Q(,XR2),X'02'            SETUP Q AND R
   1913 BC 02 07             1830          MVI   R(,XR2),X'02'              BYTES FOR SIO COMMAND
                             1831 *
   1916 35 01 1949           1832 WRCKDA   L     WRCKDX+3,XR1               MOVE RECORD
   191A 9C 00 11 00          1833          MVC   RR(1,XR2),0(,XR1)          NUMBER AND NN
   191E 9C 00 15 01          1834          MVC   NN(1,XR2),1(,XR1)            VALUE TO DDCF
                             1835 *
   1922 C0 87 1A3D           1836          B     XEQ                      GO TO EXECUTE COMMAND
                             1837 *
   1926 AE 00 11 15          1838          ALC   RR(1,XR2),NN(,XR2)       CALCULATE EXPECTED
   192A BC FF 15             1839          MVI   NN(,XR2),X'FF'             RESIDUAL RR AND NN VALUES
                             1840 *
   192D 8D 08 14 2925        1841          CLC   DL(9,XR2),RDDCF+8        GO TO ERROR END IF
   1932 C0 01 1CF3           1842          BNE   ERR18                      RESIDUAL DDCF IS INCORRECT
                             1843 *
   1936 0D 01 290E 2912      1844          CLC   IDDDR(2),RDDDR           GO TO ERROR END IF
   193C C0 01 1CD9           1845          BNE   ERR16                      RESIDUAL DDDR IS INCORRECT
                             1846 *
   1940 0E 01 1949 2811      1847          ALC   WRCKDX+3(2),P2           SETUP RETURN ADDRESS
                             1848 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   1946 C0 87 0000           1849 WRCKDX   B     *-*                      RETURN TO CALLING ROUTINE
                             1850 *
                             1851 *-------------------------------------------------------------------
                             1852 *              WRITE COUNT COMPRESSED DATA
                             1853 *
   194A 34 08 1949           1854 WRCCD    ST    WRCKDX+3,ARR             SAVE RETURN ADDRESS
                             1855 *
   194E 0C 04 28F0 2463      1856          MVC   CMD(5),MWRCCD            SETUP 'CMD' FIELD FOR PRINTOUT
                             1857 *
   1954 BC 02 06             1858          MVI   Q(,XR2),X'02'            SETUP Q AND R
   1957 BC 08 07             1859          MVI   R(,XR2),X'08'              BYTES FOR SIO COMMAND
                             1860 *
   195A C0 87 1916           1861          B     WRCKDA                   GO TO EXECUTE COMMAND
                             1862 *
                             1863 *-------------------------------------------------------------------
                             1864 *              WRITE REPEAT KEY-DATA
                             1865 *
   195E 34 08 19A4           1866 W.REP    ST    WRREPX+3,ARR             SAVE RETURN ADDRESS
                             1867 *
   1962 0C 04 28F0 2468      1868          MVC   CMD(5),MWRREP            SETUP 'CMD' FIELD FOR PRINTOUT
                             1869 *
   1968 BC 02 06             1870          MVI   Q(,XR2),X'02'            SETUF Q AND R
   196B BC 03 07             1871          MVI   R(,XR2),X'03'              BYTES FOR SIO COMMAND
                             1872 *
   196E 35 01 19A4           1873          L     WRREPX+3,XR1               MOVE RECORD
   1972 9C 00 11 00          1874          MVC   RR(1,XR2),0(,XR1)          NUMBER AND NN
   1976 9C 00 15 01          1875          MVC   NN(1,XR2),1(,XR1)            VALUE TO DDCF
                             1876 *
   197A C0 87 1A3D           1877          B     XEQ                      GO TO EXECUTE COMMAND
                             1878 *
   197E AE 00 11 15          1879          ALC   RR(1,XR2),NN(,XR2)       CALCULATE EXPECTED
   1982 BC FF 15             1880          MVI   NN(,XR2),X'FF'             RESIDUAL RR AND NN VALUES
                             1881 *
   1985 8D 08 14 2925        1882          CLC   DL(9,XR2),RDDCF+8        GO TO ERROR END IF
   198A C0 01 1CF3           1883          BNE   ERR18                      RESIDUAL DDCF IS INCORRECT
                             1884 *
   198E BC 00 11             1885          MVI   RR(,XR2),0               CLEAR RR FIELD
                             1886 *
   1991 0D 01 290E 2912      1887          CLC   IDDDR(2),RDDDR           GO TO ERROR END IF
   1997 C0 01 1CD9           1888          BNE   ERR16                      RESIDUAL DDDR IS INCORRECT
                             1889 *
   199B 0E 01 19A4 2811      1890          ALC   WRREPX+3(2),P2           SETUP RETURN ADDRESS
                             1891 *
   19A1 C0 87 0000           1892 WRREPX   B     *-*                      RETURN TO CALLING ROUTINE
                             1893 *
                             1894 *-------------------------------------------------------------------
                             1895 *              WRITE KEY-DATA
                             1896 *
   19A5 34 08 17FC           1897 WRKD     ST    RDKDX+3,ARR              SAVE RETURN ADDRESS
                             1898 *
   19A9 0C 04 28F0 246D      1899          MVC   CMD(5),MWRKD             SETUP 'CMD' FIELD FOR PRINTOUT
                             1900 *
   19AF BC 02 06             1901          MVI   Q(,XR2),X'02'            SETUP Q AND R
   19B2 BC 00 07             1902          MVI   R(,XR2),X'00'              BYTES FUR SIO COMMAND
                             1903 *
   19B5 C0 87 17AA           1904          B     RDKDA                    GO TO EXECUTE COMMAND
                             1905 *
                             1906 *-------------------------------------------------------------------
                             1907 *              SCAN EQUAL
                             1908 *
   19B9 34 08 1A00           1909 SCANE    ST    SCANHX+3,ARR             SAVE RETURN ADDRESS
                             1910 *
   19BD 0C 04 28F0 2472      1911          MVC   CMD(5),MSCANE            SETUP 'CMD' FIELD FOR PRINTOUT
                             1912 *
   19C3 BC 03 06             1913          MVI   Q(,XR2),X'03'            SETUP Q AND R
   19C6 BC 00 07             1914          MVI   R(,XR2),X'00'              BYTES FOR SIO COMMAND
                             1915 *
   19C9 C0 87 19DD           1916          B     SCANHA                   GO TO EXECUTE COMMAND
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1917 *
                         1918 *-------------------------------------------------------------
                         1919 *              SCAN HIGH OR EQUAL
                         1920 *
  19CD 34 08 1A00        1921 SCANH   ST    SCANHX+3,ARR            SAVE RETURN ADDRESS
                         1922 *
  19D1 0C 04 28F0 2477   1923        MVC   CMD(5),MSCANH           SETUP 'CMD' FIELD FOR PRINTOUT
                         1924 *
  19D7 BC 03 06          1925        MVI   Q(,XR2),X'03'           SETUP Q AND R
  19DA BC 02 07          1926        MVI   R(,XR2),X'02'             BYTES FOR SIO COMMAND
                         1927 *
  19DD 35 01 1A00        1928 SCANHA  L     SCANHX+3,XR1             MOVE RECORD
  19E1 9C 00 11 00       1929        MVC   RR(1,XR2),0(,XR1)          NUMBER AND NN
  19E5 9C 00 15 01       1930        MVC   NN(1,XR2),1(,XR1)            VALUE TO DDCF
                         1931 *
  19E9 C0 87 1A3D        1932        B     XEQ                       GO TO EXECUTE COMMAND
                         1933 *
  19ED 0D 01 290E 2912   1934        CLC   IDDDR(2),RDDDR            GO TO ERROR END IF
  19F3 C0 01 1CD9        1935        BNE   ERR16                       RESIDUAL DDDR IS INCORRECT
                         1936 *
  19F7 0E 01 1A00 2811   1937        ALC   SCANHX+3(2),P2            SETUP RETURN ADDRESS
                         1938 *
  19FD C0 87 0000        1939 SCANHX  B     *-*                       RETURN TO CALLING ROUTINE
                         1940 *
                         1941 *-------------------------------------------------------------
                         1942 *              SCAN READ OR EQUAL
                         1943 *
  1A01 34 08 1A00        1944 SCNRE   ST    SCANHX+3,ARR            SAVE RETURN ADDRESS
                         1945 *
  1A05 0C 04 28F0 247C   1946        MVC   CMD(5),MSCNRE           SETUP 'CMD' FIELD FOR PRINTOUT
                         1947 *
  1A0B BC 03 06          1948        MVI   Q(,XR2),X'03'           SETUP Q AND R
  1A0E BC 0C 07          1949        MVI   R(,XR2),X'0C'             BYTES FOR SIO COMMAND
                         1950 *
  1A11 C0 87 19DD        1951        B     SCANHA                    GO TO EXECUTE COMMAND
                         1952 *
                         1953 *-------------------------------------------------------------
                         1954 *              SCAN READ OR HIGH OR EQUAL
                         1955 *
  1A15 34 08 1A00        1956 SCNRH   ST    SCANHX+3,ARR            SAVE RETURN ADDRESS
                         1957 *
  1A19 0C 04 28F0 2481   1958        MVC   CMD(5),MSCNRH           SETUP 'CMD' FIELD FOR PRINTOUT
                         1959 *
  1A1F BC 03 06          1960        MVI   Q(,XR2),X'03'           SETUP Q AND R
  1A22 BC 0D 07          1961        MVI   R(,XR2),X'0D'             BYTES FOR SIO COMMAND
                         1962 *
  1A25 C0 87 19DD        1963        B     SCANHA                    GO TO EXECUTE COMMAND
                         1964 *
                         1965 *-------------------------------------------------------------
                         1966 *              TRACK ORIENTATION DELAY SUBROUTINE
                         1967 *
  1A29 34 08 1A3C        1968 ORIENT  ST    ORINTX+3,ARR            SAVE RETURN ADDRESS
                         1969 *
  1A2D C2 01 FD00        1970        LA    X'FD00',XR1               DELAY
  1A31 36 01 280F        1971        A     P1,XR1                      APPROXIMATELY
  1A35 C0 01 1A31        1972        BNZ   *-4                           11 MILLISECONDS
                         1973 *
  1A39 C0 87 0000        1974 ORINTX  B     *-*                       RETURN TO CALLING ROUTINE
                         1975 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1977 *************************************************************
                         1978 *                                                           *
                         1979 *              COMMON 3340 COMMAND EXECUTION SUBROUTINE     *
                         1980 *                                                           *
                         1981 *************************************************************
                         1982 *
  1A3D 34 08 1B8C        1983 XEQ     ST    XEQX+3,ARR              SAVE RETURN ADDRESS
                         1984 *
  1A41 2C 01 1AFD 07     1985        MVC   SIO+2,R(2,XR2)          MOVE Q AND R BYTES TO SIO
  1A46 2E 00 1AFC 02     1986        ALC   SIO+1,DRVADR(1,XR2)     ADD DRIVE ADDRESS TO Q BYTE
                         1987 *
  1A4B 2C 00 1AF4 02     1988        MVC   TIORDY+1(1),DRVADR(,XR2) SETUP Q BYTE IN TIO
  1A50 2C 00 1B12 02     1989        MVC   TIOBSY+1(1),DRVADR(,XR2)   'NOT RDY / UNIT CHECK' AND
  1A55 3A 01 1B12        1990        SBN   TIOBSY+1,X'01'               'SEEK BUSY' INSTRUCTIONS
                         1991 *
  1A59 2C 09 291C 15     1992        MVC   IDDCFN,NN(10,XR2)       SAVE INITIAL DDCF
                         1993 *
  1A5E 35 01 290C        1994        L     IDDCR,XR1               MOVE DDCF
  1A62 6C 09 09 15       1995        MVC   9(10,XR1),NN(,XR2)        TO EXECUTION AREA
                         1996 *
  1A66 0C 4F 28E2 28E3   1997        MVC   MSGN(80),MSGN+1         CLEAR PRINT MESSAGE AREA
                         1998 *
  1A6C 0C 01 2910 2808   1999        MVC   RDDCR(2),NULLS          CLEAR RESIDUAL
  1A72 0C 01 2912 280B   2000        MVC   RDDDR(2),NULLS            DDCR AND DDDR AREAS
                         2001 *
  1A78 0C 07 296D 280B   2002        MVC   DGSNS+7(8),NULLS        CLEAR READ SENSE AREA
                         2003 *
  1A7E 30 00 28E7        2004        SNS   SWS,0         * AMOP *  SENSE DATA SWS
  1A82 3D 81 28E6        2005        CLI   LINKID,X'81'  * LINK *    AND GO TO AMOP IF
  1A86 C0 81 201C        2006        BE    AMOPLK        * '81' *      SWS 1 & 2 CONTAIN '81'
                         2007 *
  1A8A C1 C4 1F42        2008        TIO   DASDI,X'C4'             GO TO INTERRUPT SUBR IF PENDING
                         2009 *
  1A8E 38 20 28E4        2010        TBN   IND,INTERR              GO TO ERROR PROCESSING
  1A92 C0 10 1D26        2011        BT    ERRXX                     IF UNEXPECTED 3340 INTERRUPT
                         2012 *
  1A96 C1 C2 1B9C        2013 TIO    TIO   ERR01,X'C2'             ERR IF ATTACHMENT BUSY
                         2014 *
  1A9A C0 87 1FB5        2015        B     SAVRST                  GO TO SAVE RESTART ADDR
  1A9E 31 C6 290C        2016 LIO    LIO   IDDCR,X'C6'             LOAD DDCF ADDRESS IN DDCR
  1AA2 C0 87 200E        2017        B     RSTOR                   GO TO RESTORE LOCATION 0
                         2018 *
  1AA6 38 80 28E4        2019        TBN   IND,HUNG                ERROR END IF
  1AAA F2 10 E0          2020        JT    ERR00                     LIO HANGS IN REJECTION LOOP
                         2021 *
  1AAD C0 87 1FB5        2022        B     SAVRST                  GO TO SAVE RESTART ADDR
  1AB1 31 C4 290E        2023        LIO   IDDDR,X'C4'             LOAD DDDF ADDRESS IN DDDR
  1AB5 C0 87 200E        2024        B     RSTOR                   GO TO RESTORE LOCATION 0
                         2025 *
  1AB9 38 80 28E4        2026        TBN   IND,HUNG                ERROR END IF
  1ABD F2 10 CD          2027        JT    ERR00                     LIO HANGS IN REJECTION LOOP
                         2028 *
  1AC0 30 C6 2910        2029        SNS   RDDCR,X'C6'             SENSE DDCR
  1AC4 30 C4 2912        2030        SNS   RDDDR,X'C4'             SENSE DDDR
                         2031 *
  1AC8 0D 01 290C 2910   2032        CLC   IDDCR(2),RDDCR          ERROR END IF
  1ACE F2 01 D4          2033        JNE   ERR02                     DDCR INCORRECT
                         2034 *
  1AD1 0D 01 290E 2912   2035        CLC   IDDDR(2),RDDDR          ERROR END IF
  1AD7 C0 01 1BAE        2036        BNE   ERR03                     DDDR INCORRECT
                         2037 *
  1ADB B8 04 06          2038        TBN   Q(,XR2),BIT5            BRANCH IF
  1ADE F2 10 12          2039        JT    TIORDY                    READ IPL COMMAND
                         2040 *
  1AE1 3A 04 28E4        2041        SBN   IND,OPEND               SET OP END EXPECTED INDICATOR
                         2042 *
  1AE5 BD 00 06          2043        CLI   Q(,XR2),0               BRANCH IF NOT
  1AE8 F2 01 08          2044        JNE   TIORDY                    RECAL OR SEEK COMMAND
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2045 *
 1AEB 3B 04 28E4         2046          SBF   IND,OPEND          RESET OP END EXPECTED INDICATOR
 1AEF 3A 02 28E4         2047          SBN   IND,SKEND          SET SEEK COMPLETE EXP INDICATOR
                         2048 *
 1AF3 C1 00 1BDB         2049 TIORDY   TIO   ERR05,*-*          ERROR END IF DRIVE NOT READY
                         2050 *
 1AF7 C0 87 1FB5         2051          B     SAVRST             GO TO SAVE RESTART ADDR
 1AFB F3 00 00           2052 SIO      SIO   *-*,*-*            ISSUE 3340 START I/O COMMAND
 1AFE C0 87 200E         2053          B     RSTOR              GO TO RESTORE LOCATION 0
                         2054 *
 1B02 38 80 28E4         2055          TBN   IND,HUNG           ERROR END IF SIO
 1B06 F2 10 C3           2056          JT    ERR04                HUNG IN REJECTION LOOP
                         2057 *
 1B09 C1 C2 1B11         2058          TIO   TIOBSY,X'C2'       ERROR END IF
 1B0D C0 87 1BE5         2059          B     ERR06                ATTACHMENT DID NOT GO BUSY
                         2060 *
 1B11 C1 00 1B1F         2061 TIOBSY   TIO   XEQ01,*-*          BRANCH IF SEEK BUSY
                         2062 *
 1B15 38 02 28E4         2063          TBN   IND,SKEND          ERROR END IF
 1B19 F2 10 D2           2064          JT    ERR07                SEEK IN PROGRESS
                         2065 *
 1B1C F2 87 11           2066          J     XEQ02
                         2067 *
 1B1F 38 02 28E4         2068 XEQ01    TBN   IND,SKEND          SKIP IF
 1B23 F2 10 0A           2069          JT    XEQ02                SEEK IN PROGRESS
                         2070 *
 1B26 0C 00 1B2D 1B12    2071          MVC   *+7(1),TIOBSY+1    ERROR END IF
 1B2C C1 00 1BF7         2072          TIO   ERR06,*-*            STILL SEEK BUSY
                         2073 *
 1B30 0C 02 292C 284C    2074 XEQ02    MVC   WORKN(3),TIM3S     INITIALIZE TIMER
                         2075 *
 1B36 0E 02 292C 280F    2076 XEQ04    ALC   WORKN(3),P1        INCREMENT TIMER
 1B3C C0 A0 1C17         2077          BOL   ERR09              ERROR END IF ATTACHMENT
 1B40 C1 C2 1B36         2078          TIO   XEQ04,X'C2'          BUSY FAILS TO GO OFF
                         2079 *
 1B44 30 C6 2910         2080          SNS   RDDCR,X'C6'        SENSE DDCR
 1B48 30 C4 2912         2081          SNS   RDDDR,X'C4'        SENSE DDDR
                         2082 *
 1B4C 0E 02 292C 280F    2083 XEQ03    ALC   WORKN(3),P1        ERROR END IF EXPECTED
 1B52 C0 A0 1C98         2084          BOL   ERR10                INTERRUPTS FAIL TO OCCUR
                         2085 *
 1B56 C1 C4 1F42         2086          TIO   DASDI,X'C4'        GO TO INTERRUPT SUBR IF PENDING
                         2087 *
 1B5A 39 06 28E4         2088          TBF   IND,OPEND+SKEND    BRANCH IF
 1B5E C0 90 1B4C         2089          BF    XEQ03                INTERRUPT STILL EXPECTED
                         2090 *
 1B62 38 20 28E4         2091          TBN   IND,INTERR         BRANCH IF ERROR
 1B66 C0 10 1D26         2092          BT    ERRXX                DETECTED IN INTERRUPT RTN
                         2093 *
 1B6A 35 01 290C         2094          L     IDDCR,XR1          SAVE
 1B6E 1C 09 2926 09      2095          MVC   RDDCFN,9(10,XR1)     RESIDUAL DDCF
                         2096 *
 1B73 0D 01 290C 2910    2097          CLC   IDDCR(2),RDDCR     GO TO ERROR END IF
 1B79 C0 01 1CE3         2098          BNE   ERR17                RESIDUAL DDCR IS INCORRECT
                         2099 *
 1B7D 30 C0 28E7         2100          SNS   SWS,0          * AMOP *  SENSE DATA SWS
 1B81 3D 82 28E4         2101          CLI   LINKID,X'82'   * LINK *    AND GO TO AMOP IF
 1B85 C0 81 201C         2102          BE    AMOPLK         * '82' *      SWS 1 & 2 CONTAIN '82'
                         2103 *
 1B89 C0 87 0000         2104 XEQX     B     *-*                RETURN TO CALLING ROUTINE
                         2105 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2107 ************************************************************************
                         2108 *                                                                      *
                         2109 *                    ERROR ENDING CONDITIONS                           *
                         2110 *                                                                      *
                         2111 ************************************************************************
                         2112 *
                         2113 *              LIO HUNG IN REJECTION LOOP
                         2114 *
 1B8D 0C 1E 28B7 251A    2115 ERR00    MVC   MSGA+31(31),EM04N  SETUP ERROR MESSAGE
 1B93 0C 07 28A0 24AB    2116          MVC   MSGA+8(8),EM00N
 1B99 F2 87 89           2117          J     ERR09B
                         2118 *
                         2119 *---------------------------------------------------------------------
                         2120 *              ATTACHMENT BUSY PRIOR TO COMMAND EXECUTION
                         2121 *
 1B9C 0C 26 28BF 24D2    2122 ERR01    MVC   MSGA+39(39),EM01N  SETUP ERROR MESSAGE
 1BA2 F2 87 80           2123          J     ERR09B
                         2124 *
                         2125 *---------------------------------------------------------------------
                         2126 *              DDCR FAILED TO LOAD CORRECTLY
                         2127 *
 1BA5 0C 1F 28B8 24F2    2128 ERR02    MVC   MSGA+32(32),EM02N  SETUP ERROR MESSAGE
 1BAB F2 87 0C           2129          J     ERR03A
                         2130 *
                         2131 *---------------------------------------------------------------------
                         2132 *              DDDR FAILED TO LOAD CORRECTLY
                         2133 *
 1BAE 0C 1F 28B8 24F2    2134 ERR03    MVC   MSGA+32(32),EM02N  SETUP ERROR MESSAGE
 1BB4 0C 08 28A1 24F8    2135          MVC   MSGA+9(9),EM03N
                         2136 *
 1BBA F3 C4 02           2137 ERR03A   SIO   X'02',X'C4'        DISABLE 3340 INTERRUPTS
 1BBD 30 C5 2928         2138          SNS   SNS,X'C5'          SENSE ATTACHMENT STATUS
                         2139 *
 1BC1 38 01 2928         2140          TBN   SNS,BIT7           BRANCH IF
 1BC5 F2 10 77           2141          JT    ERR0C                ADAPTER CHECK
                         2142 *
 1BC8 C0 87 1535         2143          B     RETRY              GO TO ATTEMPT ERROR RECOVERY
                         2144 *
                         2145 *---------------------------------------------------------------------
                         2146 *              SIO HUNG IN REJECTION LOOP
                         2147 *
 1BCC 0C 4F 28E2 28E3    2148 ERR04    MVC   MSGN(80),MSGN+1    CLEAR MESSAGE AREA
 1BD2 0C 1E 28B7 251A    2149          MVC   MSGA+31(31),EM04N  SETUP ERROR MESSAGE
 1BD8 F2 87 42           2150          J     ERR09A
                         2151 *
                         2152 *---------------------------------------------------------------------
                         2153 *              UNIT CHECK OR NOT READY PRIOR TO SIO
                         2154 *
 1BDB 0C 2D 28C6 2548    2155 ERR05    MVC   MSGA+46(46),EM05N  SETUP ERROR MESSAGE
 1BE1 C0 87 1D26         2156          B     ERRXX
                         2157 *
                         2158 *---------------------------------------------------------------------
                         2159 *              ATTACHMENT DID NOT GO BUSY AFTER SIO
                         2160 *
 1BE5 0C 29 28C2 2572    2161 ERR06    MVC   MSGA+42(42),EM06N  SETUP ERROR MESSAGE
 1BEB F2 87 0F           2162          J     ERR08A
                         2163 *
                         2164 *---------------------------------------------------------------------
                         2165 *              SEEK COMMAND DID NOT SET SEEK BUSY
                         2166 *
 1BEE 0C 28 28C1 2598    2167 ERR07    MVC   MSGA+41(41),EM07N  SETUP ERROR MESSAGE
 1BF4 F2 87 06           2168          J     ERR08A
                         2169 *
                         2170 *---------------------------------------------------------------------
                         2171 *              SEEK BUSY WITH NO SEEK IN PROGRESS
                         2172 *
 1BF7 0C 2C 28C5 25C8    2173 ERR08    MVC   MSGA+45(45),EM08N  SETUP ERROR MESSAGE
                         2174 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1BFD 0C 01 292C 280B      2175 ERR08A   MVC   WORKN(2),NULLS          INITIALIZE TIMER COUNT
                             2176 *
   1C03 39 06 28E4           2177 ERR08B   TBF   IND,OPEND+SKEND         LOOP UNTIL
   1C07 F2 10 0A             2178          JT    ERR08C                    COUNTER OVERFLOWS
   1C0A 0E 01 292C 280F      2179          ALC   WORKN(2),P1                 OR ALL EXPECTED
   1C10 C0 20 1C03           2180          BNOL  ERR08B                      INTERRUPTS HAVE OCCURRED
                             2181 *
   1C14 F2 87 06             2182 ERR08C   J     ERR09A
                             2183 *
                             2184 *-------------------------------------------------------------------
                             2185 *             ATTACHMENT BUSY FAILED TO GO OFF
                             2186 *
   1C17 0C 28 28C1 25F1      2187 ERR09    MVC   MSGA+41(41),EM09N         SETUP ERROR MESSAGE
                             2188 *
   1C1D 30 C6 2910           2189 ERR09A   SNS   RDDCR,X'C6'               SENSE DDCR
   1C21 30 C4 2912           2190          SNS   RDDDR,X'C4'               SENSE DDDR
                             2191 *
   1C25 30 C5 2928           2192 ERR09B   SNS   SNS,X'C5'                 SENSE ADAPTER STATUS
                             2193 *
   1C29 38 01 2928           2194          TBN   SNS,BIT7                  BRANCH IF
   1C2D C0 10 1C3F           2195          BT    ERR0C                       ADAPTER CHECK
                             2196 *
   1C31 C0 87 1535           2197          B     RETRY                     GO TO ATTEMPT RECOVERY
                             2198 *
                             2199 *-------------------------------------------------------------------
                             2200 *             DRIVE X UNIT CHECK OR NO-OP STATUS
                             2201 *
   1C35 0C 1E 28B7 2610      2202 ERR0A    MVC   MSGA+31(31),EM0AN         SETUP ERROR MESSAGE
   1C3B C0 87 1535           2203          B     RETRY                     GO TO ATTEMPT RECOVERY
                             2204 *
                             2205 *-------------------------------------------------------------------
                             2206 *             ADAPTER CHECK
                             2207 *
   1C3F 0C 4F 28E2 28E3      2208 ERR0C    MVC   MSGN(80),MSGN+1           CLEAR MESSAGE AREA
   1C45 0C 11 28AA 2622      2209          MVC   MSGA+18(18),EM0CN         SETUP ERROR MESSAGE
                             2210 *
   1C4B 0C 01 292C 2928      2211          MVC   WORKN(2),SNS              SAVE SENSE BYTES AND
   1C51 F2 87 20             2212          J     ERR0FA                      GO TO BUILD FMT 3 SENSE DATA
                             2213 *
                             2214 *-------------------------------------------------------------------
                             2215 *             UNEXPECTED INTERRUPT
                             2216 *
   1C54 0C 18 28B1 263B      2217 ERR0D    MVC   MSGA+25(25),EM0DN         SETUP ERROR MESSAGE
   1C5A C0 87 1535           2218          B     RETRY                     GO TO ATTEMPT RECOVERY
                             2219 *
                             2220 *-------------------------------------------------------------------
                             2221 *             ADAPTER SENSE BYTES DO NOT INDICATE CAUSE OF INTERRUPT
                             2222 *
   1C5E 0C 2A 28C3 2666      2223 ERR0E    MVC   MSGA+43(43),EM0EN         SETUP ERROR MESSAGE
   1C64 C0 87 1535           2224          B     RETRY                     GO TO ATTEMPT RECOVERY
                             2225 *
                             2226 *-------------------------------------------------------------------
                             2227 *             ADAPTER CHECK ON READ DIAGNOSTIC SENSE COMMAND
                             2228 *
   1C68 0C 4F 28E2 28E3      2229 ERR0F    MVC   MSGN(80),MSGN+1           CLEAR MESSAGE AREA
   1C6E 0C 3F 28D8 26A6      2230          MVC   MSGA+64(64),EM0FN         SETUP ERROR MESSAGE
                             2231 *
   1C74 3C 00 297D           2232 ERR0FA   MVI   DGSNS+23,0                CLEAR READ
   1C78 0C 16 297C 297D      2233          MVC   DGSNS+22(23),DGSNS+23       DIAG SENSE DATA AREA
                             2234 *
   1C7E 0C 01 2967 292C      2235          MVC   DGSNS+1(2),WORKN          BUILD
   1C84 31 C7 287D           2236          LIO   SNS23,X'C7'                 FORMAT 3
   1C88 30 C7 2969           2237          SNS   DGSNS+3,X'C7'                 DIAGNOSTIC
   1C8C 3C 30 296D           2238          MVI   DGSNS+7,X'30'                   SENSE DATA
                             2239 *
   1C90 3A 01 28E4           2240          SBN   IND,SNSAVL                SET SENSE DATA AVAILABLE IND
                             2241 *
   1C94 C0 87 1535           2242          B     RETRY                     GO TO ATTEMPT RECOVERY
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                             2243 *
                             2244 *-------------------------------------------------------------------
                             2245 *             EXPECTED OP END INTERRUPT DID NOT OCCUR
                             2246 *
   1C98 C1 C4 1CB5           2247 ERR10    TIO   ERR12,X'C4'               BRANCH IF INTERRUPT PENDING
                             2248 *
   1C9C 38 04 28E4           2249          TBN   IND,OPEND                 BRANCH IF NO OP END
   1CA0 F2 90 09             2250          JF    ERR11                       INTERRUPT OUTSTANDING
                             2251 *
   1CA3 0C 17 28B0 26BE      2252          MVC   MSGA+24(24),EM10N         SETUP ERROR MESSAGE
                             2253 *
   1CA9 F2 87 7A             2254          J     ERRXX
                             2255 *
                             2256 *-------------------------------------------------------------------
                             2257 *             EXPECTED SEEK COMPLETE INTERRUPT DID NOT OCCUR
                             2258 *
   1CAC 0C 1E 28B7 26DD      2259 ERR11    MVC   MSGA+31(31),EM11N         SETUP ERROR MESSAGE
   1CB2 F2 87 71             2260          J     ERRXX
                             2261 *
                             2262 *-------------------------------------------------------------------
                             2263 *             INTERRUPT PENDING, BUT INTERRUPT DID NOT OCCUR
                             2264 *
   1CB5 0C 2B 28C4 2709      2265 ERR12    MVC   MSGA+44(44),EM12N         SETUP ERROR MESSAGE
   1CBB F2 87 68             2266          J     ERRXX
                             2267 *
                             2268 *-------------------------------------------------------------------
                             2269 *             EXPECTED SCAN EQUAL DID NOT OCCUR
                             2270 *
   1CBE 0C 25 28BE 272F      2271 ERR13    MVC   MSGA+38(38),EM13N         SETUP ERROR MESSAGE
   1CC4 F2 87 5F             2272          J     ERRXX
                             2273 *
                             2274 *-------------------------------------------------------------------
                             2275 *             EXPECTED SCAN HIT DID NOT OCCUR
                             2276 *
   1CC7 0C 29 28C2 2759      2277 ERR14    MVC   MSGA+42(42),EM14N         SETUP ERROR MESSAGE
   1CCD F2 87 56             2278          J     ERRXX
                             2279 *
                             2280 *-------------------------------------------------------------------
                             2281 *             UNEXPECTED SCAN HIT CONDITION
                             2282 *
   1CD0 0C 27 28C0 2781      2283 ERR15    MVC   MSGA+40(40),EM15N         SETUP ERROR MESSAGE
   1CD6 F2 87 4D             2284          J     ERRXX
                             2285 *
                             2286 *-------------------------------------------------------------------
                             2287 *             INCORRECT RESIDUAL DDDR
                             2288 *
   1CD9 0C 1B 28B4 279D      2289 ERR16    MVC   MSGA+28(28),EM16N         SETUP ERROR MESSAGE
   1CDF C0 87 1535           2290          B     RETRY                     GO TO ATTEMPT RECOVERY
                             2291 *
                             2292 *-------------------------------------------------------------------
                             2293 *             INCORRECT RESIDUAL DDCR
                             2294 *
   1CE3 0C 1B 28B4 279D      2295 ERR17    MVC   MSGA+28(28),EM16N         SETUP ERROR MESSAGE
   1CE9 0C 08 28A1 27A6      2296          MVC   MSGA+9(9),EM17N
   1CEF C0 87 1535           2297          B     RETRY                     GO TO ATTEMPT RECOVERY
                             2298 *
                             2299 *-------------------------------------------------------------------
                             2300 *             INCORRECT RESIDUAL DDCF
                             2301 *
   1CF3 0C 1B 28B4 279D      2302 ERR18    MVC   MSGA+28(28),EM16N         SETUP ERROR MESSAGE
   1CF9 0C 08 28A1 27AF      2303          MVC   MSGA+9(9),EM18N
   1CFF C0 87 1535           2304          B     RETRY                     GO TO ATTEMPT RECOVERY
                             2305 *
                             2306 *-------------------------------------------------------------------
                             2307 *             INCORRECT RESIDUAL DDDF
                             2308 *
   1D03 0C 1B 28B4 279D      2309 ERR19    MVC   MSGA+28(28),EM16N         SETUP ERROR MESSAGE
   1D09 0C 08 28A1 27B8      2310          MVC   MSGA+9(9),EM19N
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         2311          B     RETRY                    GO TO ATTEMPT RECOVERY
                         2312 *
                         2313 *-------------------------------------------------------------
                         2314 *               UNEXPECTED SCAN EQUAL CONDITION
                         2315 *
 1D13 0C 19 28B2 27D2    2316 ERR1A    MVC   MSGA+25(26),EM1AN        SETUP ERROR MESSAGE
 1D19 F2 87 0A           2317          J     ERRXX
                         2318 *
                         2319 *-------------------------------------------------------------
                         2320 *               WRITE INHIBITED
                         2321 *
 1D1C 0C 13 28AC 27E6    2322 ERR20    MVC   MSGA+20(20),EM2ON        SETUP ERROR MESSAGE
 1D22 C0 87 1535         2323          B     RETRY                    GO TO ATTEMPT RECOVERY
                         2324 *
                         2325 *-------------------------------------------------------------
                         2326 *               COMPLETE ERROR PROCESSING
                         2327 *
 1D26 F3 C4 02           2328 ERRXX    SIO   X'02',X'C4'             DISABLE 3340 INTERRUPTS
                         2329 *
 1D29 38 20 28E4         2330          TBN   IND,INTERR               BRANCH IF INTERRUPT
 1D2D F2 10 0D           2331          JT    ERRXXA                     DETECTED ERROR CONDITION
                         2332 *
 1D30 0D 01 2928 280B    2333          CLC   SNS(2),NULLS             BRANCH IF SENSE BYTES
 1D36 F2 01 04           2334          JNE   ERRXXA                     HAVE ALREADY BEEN RETRIEVED
                         2335 *
 1D39 30 C5 2928         2336          SNS   SNS,X'C5'                SENSE ADAPTER STATUS
                         2337 *
 1D3D 38 01 2928         2338 ERRXXA   TBN   SNS,BIT7                 BRANCH IF
 1D41 C0 10 1C3F         2339          BT    ERR0C                      ADAPTER CHECK
                         2340 *
 1D45 0C 00 1D4C 1AF4    2341          MVC   *+7(1),TIORDY+1          GO TO READ DIAGNOSTIC
 1D4B C1 00 1D5B         2342          TIO   ERRXXB,*-*                 SENSE DATA IF DRV NOT READY
                         2343 *
 1D4F 2C 00 1D55 04      2344          MVC   *+6,UCKMSK(1,XR2)        BYPASS READ
 1D54 39 00 2927         2345          TBF   SNS-1,*-*                  DIAGNOSTIC SENSE
 1D58 F2 10 66           2346          JT    ERRXXD                       IF NO UNIT CHECK
                         2347 *
 1D5B 2C 00 1D8F 02      2348 ERRXXB   MVC   SIOSNS+1,DRVADR(1,XR2)   BUILD READ
 1D60 3A 01 1D8F         2349          SBN   SIOSNS+1,BIT7              DIAGNOSTIC SENSE COMMAND
                         2350 *
 1D64 C1 C2 1C17         2351          TIO   ERR09,X'C2'              BRANCH IF ATTACHMENT BUSY
                         2352 *
 1D68 C0 87 1FB5         2353          B     SAVRST                   GO TO STORE RESTART ADDR
 1D6C 31 C4 2843         2354          LIO   DGSNS@,X'C4'             LOAD DDDR TO SENSE AREA ADDR
 1D70 C0 87 200E         2355          B     RSTOR                    GO TO RESTORE LOCATION 0
                         2356 *
 1D74 30 C4 292C         2357          SNS   WORKN,X'C4'              BYPASS READ
 1D78 0D 01 292C 2843    2358          CLC   WORKN(2),DGSNS@            DIAGNOSTIC SENSE
 1D7E C0 01 1BAE         2359          BNE   ERR03                      IF INCORRECT DDDR LOAD
                         2360 *
 1D82 38 80 28E4         2361          TBN   IND,HUNG                 BYPASS READ DIAGNOSTIC
 1D86 C0 10 1B8D         2362          BT    ERR00                      SENSE IF LIO IS REJECTED
                         2363 *
 1D8A C0 87 1FB5         2364          B     SAVRST                   GO TO STORE RESTART ADDR
 1D8E F3 00 07           2365 SIOSNS   SIO   X'07',*-*                READ DIAGNOSTIC SENSE DATA
 1D91 C0 87 200E         2366          B     RSTOR                    GO TO RESTORE LOCATION 0
                         2367 *
 1D95 38 80 28E4         2368          TBN   IND,HUNG                 BRANCH IF SIO
 1D99 C0 10 1B9C         2369          BT    ERR01                      HAS REJECTED
                         2370 *
 1D9D 0C 02 292C 284C    2371          MVC   WORKN(3),TIM3S           INITIALIZE TIMER
                         2372 *
 1DA3 0E 02 292C 280F    2373 ERRXXF   ALC   WORKN(3),P1              INCREMENT TIMER
 1DA9 C0 A0 1E02         2374          BOL   ERRXXG                   ERROR END IF ATTACHMENT
 1DAD C1 C2 1DA3         2375          TIO   ERRXXF,X'C2'               BUSY FAILED TO GO OFF
                         2376 *
 1DB1 30 C5 292C         2377 ERRXXC   SNS   WORKN,X'C5'              BRANCH IF READ
 1DB5 38 01 292C         2378          TBN   WORKN,BIT7                 DIAGNOSTIC SENSE
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
 1DB9 C0 10 1C68         2379          BT    ERROF                      ENDED IN ADAPTER CHECK
                         2380 *
 1DBD 3A 01 28E4         2381          SBN   IND,SNSAVL               SET SENSE DATA AVAILABLE IND
                         2382 *
 1DC1 38 20 28E4         2383 ERRXXD   TBN   IND,INTERR               GO TO ATTEMPT RECOVERY IF
 1DC5 C0 90 1535         2384          BF    RETRY                      NOT INTERRUPT DETECTED ERROR
                         2385 *
 1DC9 0C 4F 28E2 28E3    2386          MVC   MSGN(80),MSGN+1          CLEAR MESSAGE PRINT AREA
                         2387 *
 1DCF 38 10 28E4         2388          TBN   IND,DRVERR               BRANCH IF
 1DD3 C0 90 1DF2         2389          BF    ERRXXE                     NOT UNIT CHECK
                         2390 *
 1DD7 BD 02 06           2391          CLI   Q(,XR2),X'02'            GO TO
 1DDA C0 01 1C35         2392          BNE   ERR0A                      UNIT CHECK
 1DDE 3D 80 2966         2393          CLI   DGSNS,X'80'                  ERROR PROCESSING
 1DE2 C0 01 1C35         2394          BNE   ERR0A                         UNLESS WRITE COMMAND
 1DE6 3D 02 2967         2395          CLI   DGSNS+1,X'02'                   REJECT WITH WR INHIBIT
 1DEA C0 01 1C35         2396          BNE   ERR0A
                         2397 *
 1DEE C0 87 1D1C         2398          B     ERR20                    WRITE INHIBITED ERROR
                         2399 *
 1DF2 39 14 2928         2400 ERRXXE   TBF   SNS,BIT3+BIT5            BRANCH IF
 1DF6 39 0F 2927         2401          TBF   SNS-1,X'0F'                NO INTERRUPT
 1DFA C0 10 1C5E         2402          BT    ERR0E                        BITS IN ADAPTER STATUS
                         2403 *
 1DFE C0 87 1C54         2404          B     ERR0D                    UNEXPECTED INTERRUPT ERROR
                         2405 *
 1E02 30 C5 292C         2406 ERRXXG   SNS   WORKN,X'C5'              BRANCH IF READ
 1E06 38 01 292C         2407          TBN   WORKN,BIT7                 DIAGNOSTIC SENSE
 1E0A C0 10 1C68         2408          BT    ERROF                        ENDED IN ADAPTOR CHECK
                         2409 *
 1E0E C0 87 1C17         2410          B     ERR09                    ATTACHMENT BUSY FAILED TO GO OF
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2412 ***************************************************************
                         2413 *                                                             *
                         2414 *              ERROR MESSAGE PRINT SUBROUTINE                 *
                         2415 *                                                             *
                         2416 ***************************************************************
                         2417 *
 1E12 34 08 1F41         2418 ERRPRT   ST    ERRPX+3,ARR           SAVE RETURN ADDRESS
                         2419 *
 1E16 0C 05 2898 24A3    2420         MVC   MSGA(6),EMXXN         COMPLETE FIRST PRINT LINE
                         2421 *
 1E1C 35 01 290C         2422         L     IDDCR,XR1             RETRIEVE
 1E20 1C 09 2926 09      2423         MVC   RDDCFN,9(10,XR1)        RESIDUAL DDCF
                         2424 *
 1E25 C0 87 021A         2425         B     PRINT                 PRINT
 1E29 C2                 1E29 2426    DC    XL1'C2'                 FIRST LINE
 1E2A 50                 1E2A 2427    DC    IL1'80'                   OF ERROR MESSAGE
 1E2B 28E2               1E2C 2428    DC    AL2(MSGN)
 1E2D C101               1E2E 2429    DC    AL2(HLT01)
                         2430 *
 1E2F C0 87 021A         2431 ERRP01   B     PRINT                 PRINT
 1E33 81                 1E33 2432    DC    XL1'81'                 SECOND LINE
 1E34 45                 1E34 2433    DC    AL1(MSG08N-MSG08+1)       OF ERROR MESSAGE
 1E35 2292               1E36 2434    DC    AL2(MSG08N)
                         2435 *
 1E37 0C 4F 28E2 28E3    2436         MVC   MSGN(80),MSGN+1       CLEAR MESSAGE AREA
                         2437 *
 1E3D 2C 00 2894 01      2438         MVC   MSG+1,DRV(1,XR2)      MOVE DRV NUMBER TO ERROR MSG
 1E42 0C 04 289B 28F0    2439         MVC   MSG+8(5),CMD          MOVE COMMAND NAME TO ERR MSG
 1E48 0C 06 28A3 28F7    2440         MVC   MSG+16(7),CYL         MOVE CYLINDER ADDR TO ERROR MSG
 1E4E 0C 04 28A9 28FC    2441         MVC   MSG+22(5),HD          MOVE HEAD ADDRESS TO ERROR MSG
                         2442 *
 1E54 C0 87 021E         2443         B     UNPACK                UNPACK
 1E58 03                 1E58 2444    DC    IL1'3'                  SIO COMMAND
 1E59 1AFD               1E5A 2445    DC    AL2(SIO+2)                TO MESSAGE AREA
 1E5B 28B0               1E5C 2446    DC    AL2(MSG+29)
                         2447 *
 1E5D C0 87 021E         2448         B     UNPACK                UNPACK
 1E61 02                 1E61 2449    DC    IL1'2'                  ADAPTER SENSE BYTES
 1E62 2928               1E63 2450    DC    AL2(SNS)                  TO MESSAGE AREA
 1E64 28B5               1E65 2451    DC    AL2(MSG+34)
                         2452 *
 1E66 3C C9 2888         2453         MVI   MSG+37,C'I'           'INITIAL' INDICATOR TO MSG AREA
                         2454 *
 1E6A C0 87 021E         2455         B     UNPACK                UNPACK
 1E6E 02                 1E6E 2456    DC    IL1'2'                  INITIAL DDCR
 1E6F 290C               1E70 2457    DC    AL2(IDDCR)                TO MESSAGE AREA
 1E71 28BD               1E72 2458    DC    AL2(MSG+42)
                         2459 *
 1E73 C0 87 021E         2460         B     UNPACK                UNPACK
 1E77 02                 1E77 2461    DC    IL1'2'                  INITIAL DDDR
 1E78 290E               1E79 2462    DC    AL2(IDDDR)                TO MESSAGE AREA
 1E7A 28C2               1E7B 2463    DC    AL2(MSG+47)
                         2464 *
 1E7C C0 87 021E         2465         B     UNPACK                UNPACK
 1E80 0A                 1E80 2466    DC    IL1'10'                 INITIAL DDCF
 1E81 291C               1E82 2467    DC    AL2(IDDCFN)               TO MESSAGE AREA
 1E83 28D7               1E84 2468    DC    AL2(MSG+68)
                         2469 *
 1E85 C0 87 021A         2470         B     PRINT                 PRINT
 1E89 81                 1E89 2471    DC    XL1'81'                 THIRD LINE OF
 1E8A 50                 1E8A 2472    DC    IL1'80'                   ERROR MESSAGE
 1E8B 28E2               1E8C 2473    DC    AL2(MSGN)
                         2474 *
 1E8D 0C 4F 28E2 28E3    2475         MVC   MSGN(80),MSGN+1       CLEAR MESSAGE AREA
                         2476 *
 1E93 3C D9 2888         2477         MVI   MSG+37,C'R'           'RESIDUAL' IND TO MESSAGE AREA
                         2478 *
 1E97 C0 87 021E         2479         B     UNPACK                UNPACK
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1E9B 02                 1E9B 2480    DC    IL1'2'                  RESIDUAL DDCR
 1E9C 2910               1E9D 2481    DC    AL2(RDDCR)                TO MESSAGE AREA
 1E9E 28BD               1E9F 2482    DC    AL2(MSG+42)
                         2483 *
 1EA0 C0 87 021E         2484         B     UNPACK                UNPACK
 1EA4 02                 1EA4 2485    DC    IL1'2'                  RESIDUAL DDDR
 1EA5 2912               1EA6 2486    DC    AL2(RDDDR)                TO MESSAGE AREA
 1EA7 28C2               1EA8 2487    DC    AL2(MSG+47)
                         2488 *
 1EA9 C0 87 021E         2489         B     UNPACK                UNPACK
 1EAD 0A                 1EAD 2490    DC    IL1'10'                 RESIDUAL DDCF
 1EAE 2926               1EAF 2491    DC    AL2(RDDCFN)               TO MESSAGE AREA
 1EB0 28D7               1EB1 2492    DC    AL2(MSG+68)
                         2493 *
 1EB2 C0 87 021A         2494         B     PRINT                 PRINT
 1EB6 82                 1EB6 2495    DC    XL1'82'                 FOURTH LINE OF                03
 1EB7 50                 1EB7 2496    DC    IL1'80'                   ERROR MESSAGE
 1EB8 28E2               1EB9 2497    DC    AL2(MSGN)
                         2498 *                                                                   03
 1EBA 38 80 28E5         2499         TBN   IND2,DDDFER           JUMP IF NO                    03
 1EBE F2 90 22           2500         JF    ERRP02                  RESIDUAL DDDF ERROR           03
                         2501 *                                                                   03
 1EC1 C0 87 021E         2502         B     UNPACK                UNPACK                        03
 1EC5 04                 1EC5 2503    DC    IL1'4'                  EXPECTED                      03
 1EC6 2930               1EC7 2504    DC    AL2(EXP)                  RESIDUAL DDDF               03
 1EC8 23E5               1EC9 2505    DC    AL2(MSG15N)                                           03
                         2506 *                                                                   03
 1ECA C0 87 021E         2507         B     UNPACK                UNPACK                        03
 1ECE 04                 1ECE 2508    DC    IL1'4'                  ACTUAL                        03
 1ECF 2934               1ED0 2509    DC    AL2(ACT)                  RESIDUAL DDDF               03
 1ED1 2407               1ED2 2510    DC    AL2(MSG16N)                                           03
                         2511 *                                                                   03
 1ED3 C0 87 021A         2512         B     PRINT                 PRINT                         03
 1ED7 81                 1ED7 2513    DC    XL1'81'                 EXPECTED                      03
 1ED8 22                 1ED8 2514    DC    AL1(MSG15N-MSG15+1)       RESIDUAL DDDF               03
 1ED9 23E5               1EDA 2515    DC    AL2(MSG15N)                                           03
                         2516 *                                                                   03
 1EDB C0 87 021A         2517         B     PRINT                 PRINT                         03
 1EDF 81                 1EDF 2518    DC    XL1'81'                 ACTUAL                        03
 1EE0 22                 1EE0 2519    DC    AL1(MSG16N-MSG16+1)       RESIDUAL DDDF               03
 1EE1 2407               1EE2 2520    DC    AL2(MSG16N)                                           03
                         2521 *
 1EE3 38 01 28E4         2522 ERRP02   TBN   IND,SNSAVL            BRANCH IF NO READ DIAGNOSTIC  03
 1EE7 F2 90 54           2523         JF    ERRPX                   SENSE DATA IS AVAILABLE
                         2524 *
 1EEA 0C 4F 28E2 28E3    2525         MVC   MSGN(80),MSGN+1       CLEAR MESSAGE AREA
                         2526 *
 1EF0 C0 87 021A         2527         B     PRINT                 PRINT
 1EF4 81                 1EF4 2528    DC    XL1'81'                 SENSE DATA
 1EF5 1A                 1EF5 2529    DC    AL1(MSG09N-MSG09+1)       HEADING LINE
 1EF6 22AC               1EF7 2530    DC    AL2(MSG09N)
                         2531 *
 1EF8 C0 87 021A         2532         B     PRINT                 PRINT
 1EFC 81                 1EFC 2533    DC    XL1'81'                 SENSE DATA
 1EFD 35                 1EFD 2534    DC    AL1(MSG0BN-MSG0B+1)       HEADING LINE
 1EFE 2331               1EFF 2535    DC    AL2(MSG0BN)
                         2536 *
 1F00 C0 87 021E         2537         B     UNPACK                UNPACK 4 BYTES OF
 1F04 04                 1F04 2538    DC    IL1'4'                  READ DIAGNOSTIC SENSE
 1F05 2969               1F06 2539    DC    AL2(DGSNS+3)              DATA TO MESSAGE AREA
 1F07 289A               1F08 2540    DC    AL2(MSG+7)
                         2541 *
 1F09 C0 87 021E         2542         B     UNPACK                UNPACK 4 BYTES OF
 1F0D 04                 1F0D 2543    DC    IL1'4'                  READ DIAGNOSTIC SENSE
 1F0E 296D               1F0F 2544    DC    AL2(DGSNS+7)              DATA TO MESSAGE AREA
 1F10 28A3               1F11 2545    DC    AL2(MSG+16)
                         2546 *
 1F12 C0 87 021E         2547         B     UNPACK                UNPACK 4 BYTES OF
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1F16 04               1F16 2548          DC    IL1'4'
   1F17 2971             1F18 2549          DC    AL2(DGSNS+11)
   1F19 28AC             1F1A 2550          DC    AL2(MSG+25)
                              2551 *
   1F1B C0 87 021E            2552          B     UNPACK
   1F1F 04               1F1F 2553          DC    IL1'4'
   1F20 2975             1F21 2554          DC    AL2(DGSNS+15)
   1F22 28B5             1F23 2555          DC    AL2(MSG+34)
                              2556 *
   1F24 C0 87 021E            2557          B     UNPACK
   1F28 04               1F28 2558          DC    IL1'4'
   1F29 2979             1F2A 2559          DC    AL2(DGSNS+19)
   1F2B 28BE             1F2C 2560          DC    AL2(MSG+43)
                              2561 *
   1F2D C0 87 021E            2562          B     UNPACK
   1F31 04               1F31 2563          DC    IL1'4'
   1F32 297D             1F33 2564          DC    AL2(DGSNS+23)
   1F34 28C7             1F35 2565          DC    AL2(MSG+52)
                              2566 *
   1F36 C0 87 021A            2567          B     PRINT
   1F3A 82               1F3A 2568          DC    XL1'82'
   1F3B 50               1F3B 2569          DC    IL1'80'
   1F3C 28E2             1F3D 2570          DC    AL2(MSGN)
                              2571 *
   1F3E C0 87 0000            2572 ERRPX     B     *-*
                              2573 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                   READ DIAGNOSTIC SENSE
                                     DATA TO MESSAGE AREA


   1F42 34 08 1FB4                 UNPACK 4 BYTES OF
   1F46 34 02 1FB0                   READ DIAGNOSTIC SENSE
                                       DATA TO MESSAGE AREA

   1F4A 30 C5 2928

   1F4E 38 01 2928                 UNPACK 4 BYTES OF
   1F52 F2 10 4A                     READ DIAGNOSTIC SENSE
                                       DATA TO MESSAGE AREA

   1F55 35 02 2901
   1F59 B5 02 01

   1F5C 38 10 2928                 UNPACK 4 BYTES OF
   1F60 38 04 28E4                   READ DIAGNOSTIC SENSE
   1F64 F2 10 1C                       DATA TO MESSAGE AREA

   1F67 2C 00 1F6D 03
   1F6C 38 00 2927                 PRINT
   1F70 38 02 28E4                   LAST LINE OF
   1F74 F2 90 28                       ERROR MESSAGE

   1F77 2C 00 1FAC 05
   1F7C 3B 02 28E4                 RETURN TO CALLING ROUTINE
   1F80 F2 87 08

   1F83 3C 04 1FAC
   1F87 3B 04 28E4

   1F8B 2C 00 1F91 04
   1F90 39 00 2927
   1F94 39 08 2928
   1F98 F2 10 0F

   1F9B 3A 10 28E4

   1F9F 3A 20 28E4

   1FA3 F3 C4 7E
   1FA6 C0 87 1FAD

   1FAA F3 C4 00

   1FAD C2 02 0000

   1FB1 C0 87 0000
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              2575 ***********************************************************************
                              2576 *                                                                     *
                              2577 *              3340 DEVICE END INTERRUPT SUBROUTINE                   *
                              2578 *                                                                     *
                              2579 ***********************************************************************
                              2580 *
                              2581 DASDI     ST    DASDIX+3,ARR          SAVE RETURN ADDRESS
                              2582           ST    DASDX2+3,XR2          SAVE INDEX REGISTER 2
                              2583 *
                              2584           SNS   SNS,X'C5'             SENSE ADAPTER STATUS
                              2585 *
                              2586           TBN   SNS,BIT7              BRANCH IF
                              2587           JT    DASD04                  ADAPTER CHECK
                              2588 *
                              2589           L     ADRPTR,XR2            SETUP POINTER TO
                              2590           L     1(,XR2),XR2             DRIVE DEPENDENT WORK AREA
                              2591 *
                              2592           TBN   SNS,BIT3              BRANCH IF
                              2593           TBN   IND,OPEND               EXPECTED OP END
                              2594           JT    DASD01                    INTERRUPT OCCURRED
                              2595 *
                              2596           MVC   **6,SKMSK(1,XR2)      GET SK INTRP MASK FROM DRV AREA
                              2597           TBN   SNS-1,*-*             BRANCH IF
                              2598           TBN   IND,SKEND               INTERRUPT IS
                              2599           JF    DASD04                    NOT EXPECTED
                              2600 *
                              2601           MVC   DASD06+2,SKRST(1,XR2) PREPARE TO RESET SEEK INTERRUPT
                              2602           SBF   IND,SKEND             RESET SEEK INTRP EXPECTED IND
                              2603           J     DASD02                GO TO TEST FOR UNIT CHECK
                              2604 *
                              2605 DASD01    MVI   DASD06+2,X'04'        PREPARE TO RESET OP END INTRP
                              2606           SBF   IND,OPEND             RESET OP END EXPECTED INDICATOR
                              2607 *
                              2608 DASD02    MVC   **6,UCKMSK(1,XR2)     GET UNIT CK MASK FROM DRV AREA
                              2609           TBF   SNS-1,*-*             BRANCH IF
                              2610           TBF   SNS,BIT4                UNIT CHECK OR
                              2611           JT    DASD06                    NO-OP STATUS
                              2612 *
                              2613 DASD03    SBN   IND,DRVERR            SET DRIVE ERROR INDICATOR
                              2614 *
                              2615 DASD04    SBN   IND,INTERR            SET ANY ERROR INDICATOR
                              2616 *
                              2617 DASD05    SIO   X'7E',X'C4'           RESET AND DISABLE INTERRUPTS
                              2618           B     DASDX2                GO TO RESTORE INDEX REG
                              2619 *
                              2620 DASD06    SIO   *-*,X'C4'             RESET INTERRUPT
                              2621 *
                              2622 DASDX2    LA    *-*,XR2               RESTORE INDEX REGISTER 2
                              2623 *
                              2624 DASDIX    B     *-*                   RETURN TO CALLING PROGRAM
                              2625 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2627 ********************************************************************************
                         2628 *        SAVE RESTART SUBROUTINE                                               *
                         2629 *                                                                              *
                         2630 *        THIS SUBROUTINE PLACES A RESTART ADDRESS IN LOC 00 - 03               *
                         2631 *        IN CASE OF A REJECTION LOOP ON A 'LIO' OR 'SIO' INSTRUCTION.          *
                         2632 *        IT ALSO SAVES THE ADDRESS FOLLOWING THE 'LIO' OR 'SIO'                *
                         2633 *        AND INDEX REGISTERS 1 & 2.                                            *
                         2634 *         BRANCH TO 'SAVRST' IMMEDIATELY PRIOR TO THE 'LIO' OR 'SIO'.          *
                         2635 *         BRANCH TO 'RSTOR' AFTER THE 'LIO' OR 'SIO' TO RESTORE                *
                         2636 *         LOC 00 - 03.                                                         *
                         2637 ********************************************************************************
                         2638 *
1FB5 34 08 1FF9          2639 SAVRST   ST    SAVRSX+3,ARR          SAVE RETURN ADDRESS
1FB9 34 01 2009          2640          ST    RSTXR1+3,XR1          SAVE XR1 AND XR2
1FBD 34 02 2005          2641          ST    RSTXR2+3,XR2              FOR RESTART
                         2642 *
1FC1 35 01 1FF9          2643          L     SAVRSX+3,XR1          LOAD ADDRESS OF 'LIO' OR 'SIO'
                         2644 *
1FC5 4D 00 00 1AFB       2645          CLC   0(1,XR1),SIO          IS INSTRUCTION A 'SIO'?
1FCA F2 01 06            2646          JNE   SAVRSA                JUMP IF NOT
                         2647 *
1FCD D2 01 03            2648          LA    3(,XR1),XR1           ADJUST TO ADDRESS AFTER 'SIO'
1FD0 F2 87 0B            2649          J     SAVRSB                GO TO STORE ADDRESS
                         2650 *
1FD3 4D 00 00 1A9E       2651 SAVRSA   CLC   0(,XR1),LIO           IS INSTRUCTION A 'LIO'
1FD8 F2 01 07            2652          JNE   SAVRSC                GO IF NOT
                         2653 *
1FDB D2 01 04            2654          LA    4(,XR1),XR1           ADJUST TO ADDRESS AFTER 'LIO'
1FDE 34 01 200D          2655 SAVRSB   ST    RSTAX+3,XR1           STORE RETURN FROM RESTART
                         2656 *
1FE2 3B 80 28E4          2657 SAVRSC   SBF   IND,HUNG              RESET HANG INDICATOR
1FE6 0C 03 292C 0003     2658          MVC   WORKN(4),3            STORE CONTENTS OF LOC 00 - 03
1FEC 0C 03 0003 1FFD     2659          MVC   3(4),RSTBR            STORE RESTART IN LOC 00 - 03
                         2660 *
1FF2 35 01 2009          2661          L     RSTXR1+3,XR1          RESTORE XR1
1FF6 C0 87 0000          2662 SAVRSX   B     *-*                   RETURN TO CALLING ROUTINE
                         2663
                         2663
1FFA C0 87 1FFE          2664          B     RSTRT                 THIS IS MOVED TO LOC 00 - 03
                   1FFD  2665 RSTBR    EQU   *-1                       FOR RESTART
                         2666
                         2666
                         2667 ********************************************************************************
                         2668 *        ENTER HERE ON A RESTART FOLLOWING A 'SIO' OR 'LIO'                    *
                         2669 *        HUNG IN A REJECTION LOOP                                              *
                         2670 ********************************************************************************
                         2671 *
1FFE 3A 80 28E4          2672 RSTRT    SBN   IND,HUNG              SET HANG INDICATOR
2002 C2 02 0000          2673 RSTXR2   LA    *-*,XR2               RESTORE XR2 AFTER RESTART
2006 C2 01 0000          2674 RSTXR1   LA    *-*,XR1               RESTORE XR1 AFTER RESTART
200A C0 87 0000          2675 RSTAX    B     *-*                   RETURN AFTER RESTART
                         2676
                         2676
                         2677 ********************************************************************************
                         2678 *        ENTER HERE TO RESTORE LOC 00 - 03 IF 'SIO' OR 'LIO'                   *
                         2679 *        DID NOT HANG                                                          *
                         2680 ********************************************************************************
                         2681 *
200E 34 08 201B          2682 RSTOR    ST    RSTORX+3,ARR          SAVE RETURN ADDRESS
2012 0C 03 0003 292C     2683          MVC   3(4),WORKN            RESTORE LOC 00 - 03
2018 C0 87 0000          2684 RSTORX   B     *-*                   RETURN TO CALLING ROUTINE
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2686 ********************************************************************************
                         2687 *                                                                              *
                         2688 *        INTERFACE TO ADAPTER MANUAL OPERATIONS PROGRAM (SECTION C19)           *
                         2689 *                                                                              *
                         2690 ********************************************************************************
                         2691 *
201C 34 08 2071          2692 AMOPLK   ST    AMOPX+3,ARR           SAVE RETURN ADDRESS
                         2693 *
2020 38 01 020D          2694          TBN   SBYTE5,SSW2F          RETURN TO CALLING ROUTINE
2024 F2 90 47            2695          JF    AMOPX                   IF SENSE SWITCH 2F IS NOT ON
                         2696 *
2027 34 01 2069          2697          ST    AMOPX1+3,XR1          SAVE INDEX REGISTER 1
202B 34 02 206D          2698          ST    AMOPX2+3,XR2          SAVE INDEX REGISTER 2
                         2699 *
202F 0C 18 0A39 0A18     2700          MVC   SVPFC(25),COM-1       SAVE SECTION PREFACE
                         2701 *
2035 0D 01 0A1E 2057     2702          CLC   AMOPID(2),C19         GO TO LOAD SECTION C19
203B F2 01 09            2703          JNE   AMOPLD                  IF NOT ALREADY IN MAIN STG
                         2704 *
203E 0D 01 4001 2057     2705          CLC   AMOP+1(2),C19         GO TO EXECUTE SECTION C19
2044 F2 81 18            2706          JE    AMOPGO                  IF ALREADY IN MAIN STORAGE
                         2707 *
2047 C0 87 021A          2708 AMOPLD   B     PRINT                   PRINT MESSAGE
204B 46                  2709          DC    XL1'46'                   'LOADING SECTION C19'
204C 13                  2710          DC    AL1(MSG02N-MSG02+1)
204D 21AB                2711          DC    AL2(MSG02N)
204F C'00                2712          DC    AL2(HLT00)
                         2713 *
2051 C0 87 022A          2714          B     LOAD                    LOAD SECTION C19
2055 04                  2715          DC    XL1'04'
2056 0C19                2716 C19      DC    XL2'0C19'
                         2717 *
2058 C0 87 021A          2718          B     PRINT                   PRINT MESSAGE
205C 46                  2719          DC    XL1'46'                   'SECTION C19 READY'
205D 11                  2720          DC    AL1(MSG03N-MSG03+1)
205E 21BC                2721          DC    AL2(MSG03N)
2060 C100                2722          DC    AL2(HLT00)
                         2723 *
2062 C0 87 4002          2724 AMOPGO   B     AMOP+2                  EXECUTE AMOP
                         2725 *
2066 C2 01 0000          2726 AMOPX1   LA    *-*,XR1               RESTORE
206A C2 02 0000          2727 AMOPX2   LA    *-*,XR2                 INDEX REGISTERS
                         2728 *
206E C0 87 0000          2729 AMOPX    B     *-*                   RETURN TO CALLING ROUTINE
                         2730 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              2732 ********************************************************************************
                              2733 *                                                                              *
                              2734 *        INTERFACE TO MICROCODE LOADER PROGRAM (SECTION C17)                   *
                              2735 *                                                                              *
                              2736 ********************************************************************************
                              2737 *
 2072 34 08 20B6              2738 MPL      ST    MPLX+3,ARR          SAVE RETURN ADDRESS
 2076 34 01 20AE              2739          ST    MPLX1+3,XR1         SAVE INDEX REGISTER 1
 207A 34 02 20B2              2740          ST    MPLX2+3,XR2         SAVE INDEX REGISTER 2
                              2741 *
 207E 0D 01 0A1C 20A6         2742          CLC   LDRID(2),C17        GO TO LOAD LOADER
 2084 F2 01 09                2743          JNE   LDRLD                 IF NOT ALREADY IN STG
                              2744 *
 2087 0D 01 6C01 20A6         2745          CLC   LDR+1(2),C17        BRANCH IF SECTION C17
 208D F2 81 17                2746          JE    LDRGO                 IS ALREADY IN MAIN STORAGE
                              2747 *
 2090 C0 87 021A              2748 LDRLD    B     PRINT               PRINT MESSAGE
 2094 46                2094  2749          DC    XL1'46'               LOADING SECTION C17
 2095 13                2095  2750          DC    AL1(MSG01N-MSG01+1)
 2096 2198              2097  2751          DC    AL2(MSG01N)
 2098 C100              2099  2752          DC    AL2(HLTOO)
                              2753 *
 209A 0C 18 0A39 0A18         2754          MVC   SVPFC(25),COM-1     SAVE SECTION PREFACE
                              2755 *
 20A0 C0 87 022A              2756          B     LOAD                LOAD SECTION C17
 20A4 04                20A4  2757          DC    XL1'04'
 20A5 0C17              20A6  2758 C17       DC    XL2'0C17'
                              2759 *
 20A7 C0 87 6C02              2760 LDRGO    B     LDR+2               GO TO SECTION C17
                              2761 *
 20AB C2 01 0000              2762 MPLX1    LA    *-*,XR1             RESTORE
 20AF C2 02 0000              2763 MPLX2    LA    *-*,XR2               INDEX REGISTERS
                              2764 *
 20B3 C0 87 0000              2765 MPLX     B     *-*                 RETURN TO CALLING ROUTINE
                              2766 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              2768 ********************************************************************************
                              2769 *                                                                              *
                              2770 *          3340 ATTACHMENT SYSTEM RESET SUBROUTINE                             *
                              2771 *                                                                              *
                              2772 ********************************************************************************
                              2773 *
 20B7 34 08 212D              2774 SYSRST   ST    RSTX+3,ARR          SAVE RETURN ADDRESS
 20BB 34 01 2125              2775          ST    RSTX1+3,XR1         SAVE INDEX REGISTER 1
 20BF 34 02 2129              2776          ST    RSTX2+3,XR2         SAVE INDEX REGISTER 2
                              2777 *
 20C3 C0 87 212E              2778          B     REGRST              RESET ATTACHMENT REGISTERS
                              2779 *
 20C7 C2 01 284D              2780          LA    SVPSEQ,XR1          POINT TO SVP CONTROL STRING
                              2781 *
 20CB 3C 00 2861              2782          MVI   K,0                 PRESERVE MICRO-
 20CF 38 80 0A19              2783          TBN   COM,ADRSTP            PROCESSOR ADDRESS STOP
 20D3 F2 90 04                2784          JF    RSTLP                   SETUP DURING EXECUTION
 20D6 3C 04 2861              2785          MVI   K,X'04'                 OF AMOP (SECTION C19)
                              2786 *
 20DA 1C 01 292C 01           2787 RSTLP    MVC   WORKN(2),1(,XR1)    EXECUTE
 20DF 31 C5 292C              2788          LIO   WORKN,X'C5'           SIMULATED SYSTEM
 20E3 D2 01 02                2789          LA    2(,XR1),XR1             RESET SVP INTERFACE
 20E6 7D FF 00                2790          CLI   0(,XR1),X'FF'             CONTROL SEQUENCE
 20E9 C0 01 20DA              2791          BNE   RSTLP
                              2792 *
 20ED 0C 01 292C 280F         2793          MVC   WORKN(2),P1         SETUP TIMER COUNT
                              2794 *
 20F3 30 C5 2928              2795 SNSLP    SNS   SNS,X'C5'           LOOP UNTIL
 20F7 38 01 2928              2796          TBN   SNS,BIT7              MICRO-PROCESSOR
 20FB F2 90 0A                2797          JF    DELAY                   STARTS OR COUNTER
 20FE 0E 01 292C 280F         2798          ALC   WORKN(2),P1               OVERFLOWS
 2104 C0 20 20F3              2799          BNOL  SNSLP
                              2800 *
 2108 C2 01 E5F6              2801 DELAY    LA    -6666,XR1           DELAY
 210C 36 01 280F              2802 DLYLP    A     P1,XR1                100 MSEC
 2110 C0 20 210C              2803          BNOL  DLYLP
                              2804 *
 2114 31 C5 287B              2805          LIO   CEMODE,X'C5'        SET CE MODE
 2118 31 C5 285E              2806          LIO   SVPREQ,X'C5'          INDICATORS
                              2807 *
 211C 0D FF 211C 211C         2808          CLC   *(256),*            800 USEC DELAY
                              2809 *
 2122 C2 01 0000              2810 RSTX1    LA    *-*,XR1             RESTORE
 2126 C2 02 0000              2811 RSTX2    LA    *-*,XR2               INDEX REGISTERS
                              2812 *
 212A C0 87 0000              2813 RSTX     B     *-*                 RETURN TO CALLING ROUTINE
                              2814 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2816 ************************************************************************
                         2817 *                                                                      *
                         2818 *              3340 ATTACHMENT REGISTER RESET SUBROUTINE                *
                         2819 *                                                                      *
                         2820 ************************************************************************
                         2821 *
 212E 34 08 2185         2822 REGRST   ST    REGX+3,ARR          SAVE RETURN ADDRESS
 2132 34 01 2181         2823          ST    REGX1+3,XR1         SAVE INDEX REGISTER 1
                         2824 *
 2136 C2 01 287E         2825          LA    EXTBL,XR1           POINT TO REGISTER ADDR TABLE
                         2826 *
 213A 31 C5 2867         2827          LIO   K04,X'C5'           HALT MICRO-PROCESSOR
 213E 31 C5 2869         2828          LIO   K034,X'C5'          RESET MICRO-PROCESSOR CLOCK
 2142 31 C5 286B         2829          LIO   K024,X'C5'          SET SERVICE MODE
                         2830 *
 2146 31 C5 286D         2831          LIO   C,X'C5'             X'00' --> OP REG C
                         2832 *
 214A 3C 00 286E         2833 REGLP    MVI   CR-1,0
 214E 31 C5 286F         2834          LIO   CR,X'C5'            X'00' --> OP REG CR
                         2835 *
 2152 31 C5 2873         2836          LIO   LEXTZ,X'C5'         R4-R7 --> EXTERNAL ZONE
                         2837 *
 2156 1C 00 286E 00      2838          MVC   CR-1,0(1,XR1)
 215B 31 C5 286F         2839          LIO   CR,X'C5'            EXT REG ADDR --> OP REG CR
                         2840 *
 215F 1C 00 2870 01      2841          MVC   Y-1,1(1,XR1)
 2164 31 C5 2871         2842          LIO   Y,X'C5'             EXT REG DATA --> OP REG Y
                         2843 *
 2168 31 C5 2875         2844          LIO   LEXTAR,X'C5'        R3-R7 --> EXT ADDR REG (EXTAR)
 216C 31 C5 2877         2845          LIO   LALUD,X'C5'         Y REG --> A REG --> D REG
 2170 31 C5 2879         2846          LIO   LEXT,X'C5'          D REG --> EXTERNAL REG
                         2847 *
 2174 D2 01 02           2848          LA    2(,XR1),XR1         ADVANCE TABLE POINTER
                         2849 *
 2177 7D FF 00           2850          CLI   0(,XR1),X'FF'       LOOP UNTIL ALL
 217A C0 01 214A         2851          BNE   REGLP                 REGS HAVE BEEN RESET
                         2852 *
 217E C2 01 0000         2853 REGX1    LA    *-*,XR1             RESTORE INDEX REG 1
 2182 C0 87 0000         2854 REGX     B     *-*                 RETURN TO CALLING ROUTINE
                         2855 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2857 ************************************************************************
                         2858 *                                                                      *
                         2859 *                              PRINT MESSAGES                          *
                         2860 *                                                                      *
                         2861 ************************************************************************
                         2862 *
                    2186 2863 MSG01    EQU   *
 2186 D3D6C1C4C9D5C740 2198 2864 MSG01N   DC    CL19'LOADING SECTION C17'
 2196 C3F1F7                2864
                            2864
                         2865 *
                    2199 2866 MSG02    EQU   *
 2199 D3D6C1C4C9D5C740 21AB 2867 MSG02N   DC    CL19'LOADING SECTION C19'
 21A1 E2C5C3E3C9D6D540      2867
 21A9 C3F1F9                2867
                            2868 *
                    21AC 2869 MSG03    EQU   *
 21AC E2C5C3E3C9D6D540 21BC 2870 MSG03N   DC    CL17'SECTION C19 READY'
 21B4 C3F1F940D9C5C1C4      2870
 21BC E8                    2870
                         2871 *
                    21BD 2872 MSG04    EQU   *
 21BD C9D5E5C1D3C9C440 21E6 2873 MSG04N   DC    CL42'INVALID SETTING OF SNS SWS 11-12 OR 1A-1B.'      02
 21C5 E2C5E3E3C9D5C740      2873
 21CD D6C640E2D5E240F2      2873
 21D5 E6E240F1F160F1F2      2873
 21DD 40D6D940F1C160F1      2873
 21E5 C24B                  2873
                            2874 *
                    21E7 2875 MSG05    EQU   *
 21E7 D9C5C3D6E5C5D9C5 21FF 2876 MSG05N   DC    CL25'RECOVERED AFTER X RETRIES'
 21EF C440C1C6E3C5D940      2876
 21F7 E740D9C5E3D9C9C5      2876
 21FF E2                    2876
                            2877 *
                    2200 2878 MSG06    EQU   *
 2200 C3C1D57DE340D9C5 2231 2879 MSG06N   DC    CL50'CAN''T RESTART MICROPROCESSOR - TESTING TERMINATED'
 2208 E2E3C1D9E340D4C9      2879
 2210 C3D9D6D7D9D6C3C5      2879
 2218 E2E2D6D9406040E3      2879
 2220 C5E2E3C9D5C740E3      2879
 2228 C5D9D4C9D5C1E3C5      2879
 2230 C440                  2879
                            2880 *
                    2232 2881 MSG07    EQU   *
 2232 D7C5D9D4C1D5C5D5 224D 2882 MSG07N   DC    CL28'PERMANENT ERR - RETRY FAILED'
 223A E340C5D9D9406040      2882
 2242 D9C5E3D9E840C6C1      2882
 224A C9D3C5C4              2882
                            2883 *
                    224E 2884 MSG08    EQU   *
 224E C4D9E540C3D4C440 227E 2885          DC    CL49'DRV CMD   CYL     HD    SIO    SNS     DDCR DDDR '
 2256 4040C3E8D3404040      2885
 225E 4040C8C440404040      2885
 2266 E2C9D640404040E2      2885
 226E D5E24040404040C4      2885
 2276 C4C3D940C4C4C4D9      2885
 227E 40                    2885
 227F C6C6C3C3C3C3C8C8 2292 2886 MSG08N   DC    CL20'FFCCCCHHHHRRKLDLDLNN'
 2287 C8C8D9D9D2D3C4D3      2886
 228F C4D3D5D5              2886
                            2887 *
                    2293 2888 MSG09    EQU   *
 2293 D9C5C1C440C4C9C1 22AC 2889 MSG09N   DC    CL26'READ DIAGNOSTIC SENSE DATA'
 229B C7D5D6E2E3C9C340      2889
 22A3 E2C5D5E2C540C4C1      2889
 22AB E3C1                  2889
                            2890 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         22AD 2891 MSG0A    EQU   *
   22A0 E2C5D3C5C3E340C4 22CD 2892 MSG0AB   DC    CL33'SELECT DRIVE TO BE XXXXXXXXXXXXX'          03
   22B5 D9C9E5C54JE3D640      2892
   22BD C2C540E7E7E7E7E7      2892
   22C5 E7E7E7E7E7E7E7E7      2892
   22CD E7                    2892
   22CE 4040                  2893          DC    CL02'  '
   22D0 E2D5E240E2E6E240 22FC 2894 MSG0AN   DC    CL45'SNS SWS 1A-1B SELECT DRIVES 1-2 RESPECTIVELY.'  03
   22D8 F1C160F1C240E2C5      2894                                                                      02
   22E0 D3C5C3E340C4D9C9      2894
   22E6 E5C5E240F160F240      2894
   22F0 D9C5E2D7C5C3E3C9      2894
   22F8 E5C5D3E84B            2894
                              2895 *
                         22FD 2896 MSG0B    EQU   *
   22FD F0F060606060F0F3 2317 2897          DC    CL27'00----03 04----07 08----11 '
   2305 40F0F460606060F0      2897
   230D F740F0F860606060      2897
   2315 F1F140                2897
   2318 F1F260606060F1F5 2331 2898 MSG0BN   DC    CL26'12-----15 16----19 20----23'
   2320 40F1F660606060F1      2898
   2328 F940F2F060606060      2898
   2330 F2F3                  2898
                              2899 *
                         2332 2900 MSG10    EQU   *
   233C C5D9D9D6D940C3D6 234F 2901 MSG10N   DC    CL30'ERROR CODE ---------- ACXX'
   233A C4C5406060606060      2901
   2342 6060606060606060      2901
   234A 6040C1C3E7E7          2901
                              2902 *
                         2350 2903 MSG11    EQU   *
   2350 C4D9C9E5C540C3C8 236C 2904 MSG11N   DC    CL29'DRIVE CHECKS STATUS ------ XX'
   2358 C5C3D2E240E2E3C1      2904
   2360 E3E4E24060606060      2904
   2368 606040E7E7            2904
                              2905 *
                         236D 2906 MSG12    EQU   *
   236D C4D440E2C5D8E4C5 2389 2907 MSG12N   DC    CL29'DM SEQUENCE CONTROL ------ XX'
   2375 D5C3C540C3D6D5E3      2907
   237D D9D6D34060606060      2907
   2385 606040E7E7            2907
                              2908 *
                         238A 2909 MSG13    EQU   *
   238A D3D6C1C440E2E6C9 23A6 2910 MSG13N   DC    CL29'LOAD SWITCH STATUS ------- XX'
   2392 E3C3C840E2E3C1E3      2910
   239A E4E2406060606060      2910
   23A2 606040E7E7            2910
                              2911 *
                         23A7 2912 MSG14    EQU   *
   23A7 C1C3C3C5E2E240C3 23C3 2913 MSG14N   DC    CL29'ACCESS CONTROL STATUS ---- XX'
   23AF D6D5E3D9D6D340E2      2913
   23B7 E3C1E3E4E2406060      2913
   23BF 606040E7E7            2913
                              2914 *
                         23C4 2915 MSG15    EQU   *
   23C4 C5E7D7C5C3E3C5C4 23E5 2916 MSG15N   DC    CL34'EXPECTED RESIDUAL DDDF    XXXXXXXX'
   23CC 40D9C5E2C9C4E4C1      2916
   23D4 D340C4C4C4C64040      2916
   23DC 4040E7E7E7E7E7E7      2916
   23E4 E7E7                  2916
                              2917 *
                         23E6 2918 MSG16    EQU   *
   23E6 C1C3E3E4C1D34040 2407 2919 MSG16N   DC    CL34'ACTUAL    RESIDUAL DDDF    XXXXXXXX'
   23EE 40D9C5E2C9C4E4C1      2919
   23F6 D340C4C4C4C64040      2919
   23FE 4040E7E7E7E7E7E7      2919
   2406 E7E7                  2919
                              2920 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   240B F0F0F061F0F0F0 240E 2921 REZERO   DC    CL7'000/000'          CYL AND HD FIELD INITIALIZER
                              2922 *
   240F D9C5C3C1D3      2413 2923 MRECAL   DC    CL5'RECAL'
   2414 E2C5C5D240      2418 2924 MSEEK    DC    CL5'SEEK '
   2419 D9C4C8C1C5      241D 2925 MRDHAE   DC    CL5'RDHAE'
   241E D9C4C8C1D6      2422 2926 MRDHAO   DC    CL5'RDHAO'
   2423 D9C4D9F0D6      2427 2927 MRDR00   DC    CL5'RDR00'
   2428 D9C4C3D2C4      242C 2928 MRDCKD   DC    CL5'RDCKD'
   242D D9C4C4C7D5      2431 2929 MRDDGN   DC    CL5'RDDGN'
   2432 D9C4D2C440      2436 2930 MRDKD    DC    CL5'RDKD '
   2437 D9C4E5D2C4      243B 2931 MRDVKD   DC    CL5'RDVKD'
   243C D9C4D3D6C7      2440 2932 MRDLOG   DC    CL5'RDLOG'
   2441 D9C4E2D5E2      2445 2933 MRDSNS   DC    CL5'RDSNS'
   2446 D9C4C9D7D3      244A 2934 MRDIPL   DC    CL5'RDIPL'
   244B E6D9C8C1C5      244F 2935 MWRHAE   DC    CL5'WRHAE'
   2450 E6D9C8C1D6      2454 2936 MWRHAO   DC    CL5'WRHAO'
   2455 E6D9D9F0D6      2459 2937 MWRR00   DC    CL5'WRR00'
   245A E6D9C3D2C4      245E 2938 MWRCKD   DC    CL5'WRCKD'
   245F E6D9C3C3C4      2463 2939 MWRCCD   DC    CL5'WRCCD'
   2464 E6D9D9C5D7      2468 2940 MWREP    DC    CL5'WREP'
   2469 E6D9D2C440      246D 2941 MWRKD    DC    CL5'WRKD '
   246E E2C3C1D5C5      2472 2942 MSCANE   DC    CL5'SCANE'
   2473 E2C3C1D5C8      2477 2943 MSCANH   DC    CL5'SCANH'
   2478 E2C3D5D9C5      247C 2944 MSCNRE   DC    CL5'SCNRE'
   247D E2C3D5D9C8      2481 2945 MSCNRH   DC    CL5'SCNRH'
   2482 C9D5C9E3C9C1D3C9 248F 2946 MINIT    DC    CL14'INITIALIZED.  '                              03
   248A E9C5C44B4040          2946
   2490 E3C5E2E3C5C44B40 249D 2947 MTEST    DC    CL14'TESTED.       '                              03
   2498 404040404040          2947                                                                  03
                              2948 *
                         249E 2949 EMXX     EQU   *
   249E C5D9D940F2F0    24A3 2950 EMXXN    DC    CL6'ERR 20'
                              2951 *
                         24A4 2952 EM00     EQU   *
   24A4 F0F0406040D3C9D6 24AB 2953 EM00N    DC    CL8'00 - LIO'
                              2954 *
                         24AC 2955 EM01     EQU   *
   24AC F0F1406040C1E3E3 24D2 2956 EM01N    DC    CL39'01 - ATTACHMENT BUSY -TIO- PRIOR TO SIO'
   24B4 C1C3C8D4C5D5E340      2956
   24BC C2E4E2E84060E3C9      2956
   24C4 D66040D7D9C9D6D9      2956
   24CC 40E3D640E2C9D6        2956
                              2957 *
                         24D3 2958 EM02     EQU   *
   24D3 F0F2406040C4C4C3 24F2 2959 EM02N    DC    CL32'02 - DDCR DID NOT LOAD CORRECTLY'
   24DB D940C4C9C440D5D6      2959
   24E3 E340D3D6C1C440C3      2959
   24EB D6D9D9C5C3E3D3E8      2959
                              2960 *
                         24F3 2961 EM03     EQU   *
   24F3 F0F3406040C4C4C4 24F8 2962 EM03N    DC    CL9'03 - DDDR'
   24FB D9                    2962
                              2963 *
                         24FC 2964 EM04     EQU   *
   24FC F0F4406040E2C9D6 251A 2965 EM04N    DC    CL31'04 - SIO HUNG IN REJECTION LOOP'
   2504 40C8E4D5C740C9D5      2965
   250C 40D9C5D1C5C3E3C9      2965
   2514 D6D540D3D6D6D7        2965
                              2966 *
                         2518 2967 EM05     EQU   *
   2518 F0F5406040C4D9E5 2548 2968 EM05N    DC    CL46'05 - DRV NOT RDY OR UNIT CK -TIO- PRIOR TO SIO'
   2523 40D5D6E340D9C9E8      2968
   252B 40D6D940E4D5C9E3      2968
   2533 40C3D24060E3C9D6      2968
   253B 6040D7D9C9D6D940      2968
   2543 E3D640E2C9D6          2968
                              2969 *
                         2549 2970 EM06     EQU   *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2549 F0F6406040E2C9D6 2572 2971 EM06N    DC    CL42'06 - SIO DID NOT SET ATTACHMENT BUSY -TIO-'
   2551 40C4C9C440D5D6E3      2971
   2559 40E2C5E340C1E3E3      2971
   2561 C1C3C8D4C5D5E340      2971
   2569 C2E4E2E84060E3C9      2971
   2571 D660                  2971
                              2972 *
                         2573 2973 EM07     EQU   *
   2573 F0F7406040E2C5C5 259B 2974 EM07N    DC    CL41'07 - SEEK CMD DID NOT SET SEEK BUSY -TIO-'
   257B D240C3D4C440C4C9      2974
   2583 C440D5D6E340E2C5      2974
   258B E340E2C5C5D240C2      2974
   2593 E4E2E84060E3C9D6      2974
   259B 60                    2974
                              2975 *
                         259C 2976 EM08     EQU   *
   259C F0F8406040E2C5C5 25C8 2977 EM08N    DC    CL45'08 - SEEK BUSY -TIO- WITH NO SEEK IN PROGRESS'
   25A4 D240C2E4E2E84060      2977
   25AC E3C9D66040E6C9E3      2977
   25B4 C840D5D640E2C5C5      2977
   25BC D240C9D540D7D9D6      2977
   25C4 C7D9C5E2E2            2977
                              2978 *
                         25C9 2979 EM09     EQU   *
   25C9 F0F9406040C1E3E3 25F1 2980 EM09N    DC    CL41'09 - ATTACHMENT BUSY -TIO- DID NOT GO OFF'
   25D1 C1C3C8D4C5D5E340      2980
   25D9 C2E4E2E84060E3C9      2980
   25E1 D66040C4C9C440D5      2980
   25E9 D6E340C7D640D6C6      2980
   25F1 C6                    2980
                              2981 *
                         25F2 2982 EM0A     EQU   *
   25F2 F0C1406040E4D5C9 2610 2983 EM0AN    DC    CL31'0A - UNIT CHECK OR NO-OP STATUS'
   25FA E340C3C8C5C3D240      2983
   2602 D6D940D5D660D6D7      2983
   260A 40E2E3C1E3E4E2        2983
                              2984 *
                         2611 2985 EM0C     EQU   *
   2611 F0C3406040C1C4C1 2622 2986 EM0CN    DC    CL18'0C - ADAPTER CHECK'
   2619 D7E3C5D940C3C8C5      2986
   2621 C3D2                  2986
                              2987 *
                         2623 2988 EM0D     EQU   *
   2623 F0C4406040E4D5C5 263B 2989 EM0DN    DC    CL25'0D - UNEXPECTED INTERRUPT'
   262B E7D7C5C3E3C5C440      2989
   2633 C9D5E3C5D9D9E4D7      2989
   263B E3                    2989
                              2990 *
                         263C 2991 EM0E     EQU   *
   263C F0C5406040C9D5E3 2666 2992 EM0EN    DC    CL43'0E - INTERRUPT WITH NO INTERRUPT BIT IN SNS'
   2644 C5D9D9E4D7E340E6      2992
   264C C9E3C840D5D640C9      2992
   2654 D5E3C5D9D9E4D7E3      2992
   265C 40C2C9E340C9D540      2992
   2664 E2D5E2                2992
                              2993 *
                         2667 2994 EM0F     EQU   *
   2667 F0C6406040C1C4C1 268F 2995          DC    CL41'0F - ADAPTER CK ON RD DIAG SNS AFTER DRV '
   266F D7E3C5D940C3D240      2995
   2677 D6D540D9C440C4C9      2995
   267F C1C740E2D5E240C1      2995
   2687 C6E3C5D940C4D9E5      2995
   268F 40                    2995
   2690 E4D5C9E340C3D240 26A6 2996 EM0FN    DC    CL23'UNIT CK OR NO-OP STATUS'
   2698 D6D940D5D660D6D7      2996
   26A0 40E2E3C1E3E4E2        2996
                              2997 *
                         26A7 2998 EM10     EQU   *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   26A7 F1F0406040D5D640 268E 2999 EM10N    DC    CL24'10 - NO OP END INTERRUPT'
   26AF D6D74CC5D5C440C9      2999
   26B7 D5E3C5D9D9E4D7E3      2999
                              3000 *
                         26BF 3001 EM11     EQU   *
   26BF F1F1406040D5D640 26DD 3002 EM11N    DC    CL31'11 - NO SEEK COMPLETE INTERRUPT'
   26C7 E2C5C5D240C3D6D4      3002
   26CF D7D3C5E3C540C9D5      3002
   26D7 E3C5D9D9E4D7E3        3002
                              3003 *
                         26DE 3004 EM12     EQU   *
   26DE F1F2406040C6C1D3 2709 3005 EM12N    DC    CL44'12 - FALSE INTERRUPT PENDING -TIO- CONDITION'
   26E6 E2C540C9D5E3C5D9      3005
   26EE D9E4D7E340D7C5D5      3005
   26F6 C4C9D5C74060E3C9      3005
   26FE D66040C3D6D5C4C9      3005
   2706 E3C9D6D5              3005
                              3006 *
                         270A 3007 EM13     EQU   *
   270A F1F3406040C5E7D7 272F 3008 EM13N    DC    CL38'13 - EXPECTED SCAN EQUAL DID NOT OCCUR'
   2712 C5C3E3C5C440F2C3      3008
   271A C1D540C5D8E4C1D3      3008
   2722 40C4C9C440D3D6E3      3008
   272A 40D6C3C3E4D9          3008
                              3009 *
                         2730 3010 EM14     EQU   *
   2730 F1F4406040C5E7D7 2759 3011 EM14N    DC    CL42'14 - EXPECTED SCAN HIT -TIO- DID NOT OCCUR'
   2738 C5C3E3C5C440E2C3      3011
   2740 C1D540C8C9E34060      3011
   2748 E3C9D66040C4C9C4      3011
   2750 40D5D6E340D6C3C3      3011
   2758 E4D9                  3011
                              3012 *
                         275A 3013 EM15     EQU   *
   275A F1F5406040E4D5C5 2781 3014 EM15N    DC    CL40'15 - 'NEXPECTED SCAN HIT -TIO- CONDITION'
   2762 E7D7C5C3E3C5C440      3014
   276A E2C3C1D540C8C9E3      3014
   2772 4060E3C9D66040C3      3014
   277A D6D5C4C9E3C9D6D5      3014
                              3015 *
                         2782 3016 EM16     EQU   *
   2782 F1F6406040C4C4C4 279D 3017 EM16N    DC    CL28'16 - DDDR RESIDUAL INCORRECT'
   278A D940D9C5E2C9C4E4      3017
   2792 C1D340C9D5C3D6D9      3017
   279A D9C5C3E3              3017
                              3018 *
                         279E 3019 EM17     EQU   *
   279E F1F7406040C4C4C3 27A6 3020 EM17N    DC    CL9'17 - DDCR'
   27A6 D9                    3020
                              3021 *
                         27A7 3022 EM18     EQU   *
   27A7 F1F8406040C4C4C3 27AF 3023 EM18N    DC    CL9'18 - DDCF'
   27AF C6                    3023
                              3024 *
                         27B0 3025 EM19     EQU   *
   27B0 F1F9406040C4C4C4 27B8 3026 EM19N    DC    CL9'19 - DDDF'
   27B8 C6                    3026
                              3027 *
                         27B9 3028 EM1A     EQU   *
   27B9 F1C1406040E4D5C5 27D2 3029 EM1AN    DC    CL26'1A - UNEXPECTED SCAN EQUAL'
   27C1 E7D7C5C3E3C5C440      3029
   27C9 E2C3C1D540C5D8E4      3029
   27D1 C1D3                  3029
                              3030 *
                         27D3 3031 EM20     EQU   *
   27D3 F2F0406040E6D9C9 27E6 3032 EM20N    DC    CL20'20 - WRITE INHIBITED'
   27DB E3C540C9D5C8C9C2      3032
   27E3 C9E3C5C4              3032
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              3033 *
                         27E7 3034 EM30     EQU   *
   27E7 C5D9D940F2F0F3E7 27EE 3035 EM30A    DC    CL08'ERR 203X'
   27EF 406040D9C5C1C440 2801 3036 EM30N    DC    CL19' - READ IPL FAILURE'
   27F7 C9D7D340C6C1C9D3      3036
   27FF E4D9C5                3036
                              3037 *
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              3039 ********************************************************************************
                              3040 *                                                                              *
                              3041 *                CONSTANTS AND RESERVED STORAGE AREAS                          *
                              3042 *                                                                              *
                              3043 ********************************************************************************
                              3044 *
                              3045 *             CONSTANTS
                              3046 *
                         2802 3047 NULLS    DC    10XL1'00'
                              3047
                              3048 *
                         280C 3049 D1       DC    CL1'1'
                              3050 *
                         280F 3051 P1       DC    IL3'1'
                         2811 3052 P2       DC    IL2'2'
                         2813 3053 P3       DC    IL2'3'                                                    03
                         2815 3054 P4       DC    IL2'4'
                         2819 3055 P5       DC    IL4'5'
                         281D 3056 P8       DC    IL4'8'
                         281F 3057 P10      DC    IL2'10'                                                   03
                         2821 3058 P20      DC    IL2'20'
                         2823 3059 P80      DC    IL2'80'
                         2827 3060 P256     DC    IL4'256'                                                  02
                         2829 3061 P349     DC    IL2'349'
                         282B 3062 P640     DC    IL2'640'
                         282D 3063 P1200    DC    IL2'1199'                                                 03
                         282F 3064 P4092    DC    IL2'4092'
                              3065 *                                                                         03
                         2831 3066 N1       DC    IL2'-1'
                              3067 *
                         2835 3068 FFPTN    DC    4XL1'FF'          SCAN TEST MASK
                              3069 *
                         2839 3070 WCPTN    DC    XL4'7777FFAA'     WORST CASE TEST PATTERN
                              3071 *
                         283A 3072 PATRN    EQU   *
                         283D 3073          DS    XL4               TEST PATTERN TEMPORARY STORAGE
                              3074 *
                         2840 3075          DC    IL3'1000'         INTERVAL TIMER INITIAL VALUE
                         2841 3076 INTVL    DC    IL1'0'
                              3077 *
                         2843 3078 DGSNS@   DC    AL2(DGSNS)        ADDR OF RD DIAG SENSE AREA
                         2845 3079 WCPTN@   DC    AL2(WCPTN)        ADDR OF WORST CASE TEST PATTERN   03
                              3080 *
                         2847 3081 DDCR     DC    AL2(DDCF)         INITIAL DDCR INITIALIZATION VALUE
                         2849 3032 DDDR     DC    AL2(DDDF)         INITIAL DDDR INITIALIZATION VALUE
                              3083 *
                         284C 3084 TIM3S    DC    XL3'FE6000'       INITIAL VALUE FOR 3 SECOND TIMER
                              3085 *
                              3086 *-------------------------------------------------------------------------
                              3087 *
                              3088 *             SVP INTERFACE CONTROL BYTES
                         284D 3089 SVPSEQ   EQU   *                 SYSTEM RESET SVP CONTROL STRING
                         284E 3090          DC    XL2'0008'           X'00' --> OP REG C
                         2850 3091          DC    XL2'C00A'           X'00' --> OP REG CR
                         2852 3092          DC    XL2'BF0B'           INDEX VALUE (BF) --> OP REG Y
                         2854 3093          DC    XL2'020F'           OP REG Y --> A REG --> D REG
                         2856 3094          DC    XL2'880E'           D REG --> INDEX REG
                         2858 3095          DC    XL2'080E'           SERVICE ACCESS CYCLE
                         285A 3096          DC    XL2'8802'           RESET SERVICE MODE
                         285C 3097          DC    XL2'2009'           SYS RESET FLAG --> X REG
                         285E 3098 SVPREQ   DC    XL2'0003'           SET SVP REQUEST
                         2860 3099          DC    XL2'000E'           EXECUTE FIRST MICRO-INSTRUCTION
                         2861 3100 K        DC    XL1'00'             RESTORE K REG
                         2862 3101          DC    XL1'02'
                         2864 3102 RUNMP    DC    XL2'000E'           START MICROPROCESSOR
                         2865 3103          DC    XL1'FF'             END SVP STRING
                              3104 *
                         2867 3105 K04      DC    XL2'8802'           HALT MICROPROCESSOR
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   2868 9802                2869 3106 K034     DC    XL2'9802'      RESET MICROPROCESSOR CLOCK
   286A A802                286B 3107 K024     DC    XL2'A802'      SET SERVICE MODE
   286C 0008                286D 3108 C        DC    XL2'0008'      X'00' --> OP REG C
   286E 000A                286F 3109 CR       DC    XL2'000A'      X'00' --> OP REG CR
   2870 000B                2871 3110 Y        DC    XL2'000B'      X'00' --> OP REG Y
   2872 010C                2873 3111 LEXTZ    DC    XL2'010C'      R4-R7 --> EXTERNAL ZONE REG
   2874 000C                2875 3112 LEXTAR   DC    XL2'000C'      R3-R7 --> EXT ADDR REG (EXTAR)
   2876 020F                2877 3113 LALUD    DC    XL2'020F'      Y REG --> A REG --> D REG
   2878 020D                2879 3114 LEXT     DC    XL2'020D'      D REG --> EXTERNAL REG
   287A C809                287B 3115 CEMODE   DC    XL2'C809'      CE MODE INDICATORS --> X REG
   287C 0002                287D 3116 SNS23    DC    XL2'0002'      SENSE ERROR BYTES
                            3117 *
                            287E 3118 EXTBL    EQU   *              ATTACHMENT
   287E 2D80                287F 3119 FTR      DC    XL2'2D80'        EXTERNAL
   2880 2D00                2881 3120          DC    XL2'2D00'          REGISTER
   2882 2F00                2883 3121 SCN      DC    XL2'2F00'            ADDRESS
   2884 3300                2885 3122 DXC      DC    XL2'3300'              TABLE
   2886 2500                2887 3123 FTG      DC    XL2'2500'
   2888 238F                2889 3124 DST      DC    XL2'238F'
   288A 2300                288B 3125          DC    XL2'2300'
   288C 2780                288D 3126 FHF      DC    XL2'2780'
   288E 2700                288F 3127          DC    XL2'2700'
   2890 3F00                2891 3128 SBO      DC    XL2'3F00'
   2892 FF                  2892 3129          DC    XL1'FF'
                            3130 *
                            3131 *-------------------------------------------------------------------
                            3132 *              COMMON INDICATORS AND WORK AREAS
                            3133 *
                            2893 3134 MSG      EQU   *
   2893                     2898 3135 MSGA     DS    CL6            ERROR MESSAGE
   2899                     28E2 3136 MSGN     DS    CL74             BUFFER AREA
   28E3 00                  28E3 3137          DC    XL1'00'
                            3138 *
   28E4 00                  28E4 3139 IND      DC    XL1'0'         PROGRAM INDICATORS
   28E5 00                  28E5 3140 IND2     DC    XL1'0'         PROGRAM INDICATORS                03
                            3141 *
   28E6                     28E7 3142 SWS      DS    XL2            DATA SWS SENSE AREA
                            28E6 3143 LINKID   EQU   SWS-1         SWS 1 & 2 CONTAIN AMOP LINK CONTROL
                            3144 *
   28E8                     28EB 3145 SSWSV    DS    XL4            SECTION SENSE SWITCH STORAGE
                            3146 *
   28EC                     28F0 3147 CMD      DS    CL5            COMMAND NAME
   28F1                     28F7 3148 CYL      DS    CL7            CURRENT CYLINDER ADDRESS    S3/3340
   28F8                     28FC 3149 HD       DS    CL5            CURRENT HEAD ADDRESS    S3/3340
                            3150 *
   28FD                     28FE 3151 LPCNT    DS    XL2            ROUTINE LOOP COUNTER
   28FF                     28FF 3152 ERRCNT   DS    CL1            ERROR RETRY COUNTER
                            3153 *
   2900                     2901 3154 ADRPTR   DS    XL2            DRIVE SELECTION POINTER
                            3155 *
                            2902 3156 ADRTBL   EQU   *
   2902                     290A 3157          DS    XL9            DRIVE SELECTION TABLE
                            3158 *
   2908                     290C 3159 IDDCR    DS    XL2            INITIAL DDCR VALUE
   290D                     290E 3160 IDDDR    DS    XL2            INITIAL DDDR VALUE
                            3161 *
   290F                     2910 3162 RDDCR    DS    XL2            RESIDUAL DDCR VALUE
   2911                     2912 3163 RDDDR    DS    XL2            RESIDUAL DDDR VALUE
                            3164 *
                            2913 3165 IDDCF    EQU   *              INITIAL DDCF
   2913                     291C 3166 IDDCFN   DS    XL10
                            3167 *
                            291D 3168 RDDCF    EQU   *              RESIDUAL DDCF
   291D                     2926 3169 RDDCFN   DS    XL10
                            3170 *
   2927                     2928 3171 SNS      DS    XL2            3340 ADAPTER SENSE INFO
                            3172 *
                            2929 3173 WORK     EQU   *              GENERAL PURPOSE
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   2929                     292C 3174 WORKN    DS    XL4              WORK AREA
                            3175 *                                                              03
   292D 00000000            2930 3176 EXP      DC    XL4'0'         EXPECTED RESIDUAL DDUF       03
   2931 00000000            2934 3177 ACT      DC    XL4'0'         ACTUAL RESIDUAL D            03
   2935 00                  2935 3178 CODE     DC    XL1'0'         ERROR CODE                   03
   2936 00                  2936 3179 TAG13    DC    XL1'0'         TAG13                        03
   2937 00                  2937 3180 TAG43    DC    XL1'0'         TAG43                        03
   2938 00                  2938 3181 TAG23    DC    XL1'0'         TAG23                        03
   2939 00                  2939 3182 TAG83    DC    XL1'0'         TAG83                        03
                            3183 *
                            293A 3184 DRVWK    EQU   *              START OF DRV DEPENDENT WORK AREAS
                            3185 *-------------------------------------------------------------------
                            3186 *              DRIVE 1 INDICATORS AND WORK AREAS
                            3187 *
                            293A 3188 DRVWK1   EQU   *              START OF DRIVE 1 WORK AREA
                            3189 *
   293A 00                  293A 3190 DIND     DC    XL1'00'        DRIVE DEPENDENT INDICATORS
                            3191 *
   293B F1                  293B 3192 DRV      DC    CL1'1'         DRIVE NUMBER
   293C C0                  293C 3193 DRVADR   DC    XL1'C0'        DRIVE ADDRESS
                            3194 *
   293D 08                  293D 3195 SKMSK    DC    XL1'08'        SEEK COMPLETE INTERRUPT MASK
   293E 80                  293E 3196 UCKMSK   DC    XL1'80'        UNIT CHECK MASK
   293F 40                  293F 3197 SKRST    DC    XL1'40'        SEEK COMPLETE INTERRUPT RESET R BYTE
                            3198 *
   2940                     2940 3199 Q        DS    XL1            SIO Q BYTE
   2941                     2941 3200 R        DS    XL1            SIO R BYTE
                            3201 *
   2942                     2945 3202 PA       DS    XL4            CURRENT PHYSICAL ACCESS POSITION
                            3203 *
   2946                     2946 3204 FF       DS    XL1            FLAG VALUE
   2947                     2948 3205 CC       DS    XL2            CYLINDER ADDRESS
   2949                     294A 3206 HH       DS    XL2            HEAD ADDRESS
   294B                     294B 3207 RR       DS    XL1            RECORD NUMBER
   294C                     294C 3208 KL       DS    XL1            KEY LENGTH
   294D                     294E 3209 DL       DS    XL2            DATA LENGTH
   294F                     294F 3210 NN       DS    XL1            NUMBER OF RECORDS
                            3211 *
                            3212 *-------------------------------------------------------------------
                            3213 *              DRIVE 2 INDICATORS AND WORK AREAS
                            3214 *
                            2950 3215 DRVWK2   EQU   *              START OF DRIVE 2 WORK AREA
                            3216 *
   2950 00                  2950 3217 DIND2    DC    XL1'00'        DRIVE DEPENDENT INDICATORS
                            3218 *
   2951 F2                  2951 3219 DRV2     DC    CL1'2'         DRIVE NUMBER
   2952 C8                  2952 3220 DRVAD2   DC    XL1'C8'        DRIVE ADDRESS
                            3221 *
   2953 04                  2953 3222 SKMSK2   DC    XL1'04'        SEEK COMPLETE INTERRUPT MASK
   2954 40                  2954 3223 UCKMS2   DC    XL1'40'        UNIT CHECK MASK
   2955 20                  2955 3224 SKRST2   DC    XL1'20'        SEEK COMPLETE INTERRUPT RESET R BYTE
                            3225 *
   2956                     2956 3226 Q2       DS    XL1            SIO Q BYTE
   2957                     2957 3227 R2       DS    XL1            SIO R BYTE
                            3228 *
   2958                     295B 3229 PA2      DS    XL4            CURRENT PHYSICAL ACCESS POSITION
                            3230 *
   295C                     295C 3231 FF2      DS    XL1            FLAG VALUE
   295D                     295E 3232 CC2      DS    XL2            CYLINDER ADDRESS
   295F                     2960 3233 HH2      DS    XL2            HEAD ADDRESS
   2961                     2961 3234 RR2      DS    XL1            RECORD NUMBER
   2962                     2962 3235 KL2      DS    XL1            KEY LENGTH
   2963                     2964 3236 DL2      DS    XL2            DATA LENGTH
   2965                     2965 3237 NN2      DS    XL1            NUMBER OF RECORDS
                            3238 *
                            3239 *-------------------------------------------------------------------
                            3240 *
                            2966 3241 DGSNS    EQU   *              3340 SUBSYSTEM SENSE DATA
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2966                  297D 3242          DS    XL24
                              3243 *
                              3244 *-------------------------------------------------------------------
                              3245 *                AC CODE TABLE
                              3246 *
                         297E 3247 ACTABL   EQU   *
   297E 8283EFFF000000   2984 3248          DC    XL7'8283EFFF000000'
   2985 8383E7FF001800   298B 3249          DC    XL7'8383E7FF001800'
   298C 8483E3FF001400   2992 3250          DC    XL7'8483E3FF001400'
   2993 8583E1FF001000   2999 3251          DC    XL7'8583E1FF001000'
   299A 8683E0FF001300   29A0 3252          DC    XL7'8683E0FF001300'
   29A1 8781E0FF021200   29A7 3253          DC    XL7'8781E0FF021200'
   29A8 8881A0FF001200   29AE 3254          DC    XL7'8881A0FF001200'
   29AF 898120FF005200   29B5 3255          DC    XL7'898120FF005200'
   29B6 8A8100FF00D200   29BC 3256          DC    XL7'8A8100FF00D200'
   29BD 8B8100FF00F200   29C3 3257          DC    XL7'8B8100FF00F200'
   29C4 9883FF7F040080   29CA 3258          DC    XL7'9883FF7F040080'
   29CB 9983FF5F040020   29D1 3259          DC    XL7'9983FF5F040020'
   29D2 9A83FF4F040010   29D8 3260          DC    XL7'9A83FF4F040010'
   29D9 9B03FF4F840000   29DF 3261          DC    XL7'9B03FF4F840000'
   29E0 9C03FF4F040000   29E6 3262          DC    XL7'9C03FF4F040000'
   29E7 8183FFFF080000   29ED 3263          DC    XL7'8183FFFF080000'
   29EE 9183FDFF0C0C00   29F4 3264          DC    XL7'9183FDFF0C0000'
   29F5 9283F5FF0C0A00   29FB 3265          DC    XL7'9283F5FF0C0A00'
   29FC 9381F5FF0E0200   2A02 3266          DC    XL7'9381F5FF0E0200'
   2A03 9481E5FF0C0200   2A09 3267          DC    XL7'9481E5FF0C0200'
   2A0A 9581E5FF0C1200   2A10 3268          DC    XL7'9581E5FF0C1200'
                              3269 *
   2A11 1883FFFF100000   2A17 3270          DC    XL7'1883FFFF100000'
   2A18 0983FFFF140000   2A1E 3271          DC    XL7'0983FFFF140000'
   2A1F 0983FFFF180000   2A25 3272          DC    XL7'0983FFFF180000'
   2A26 1183DFFF1C0000   2A2C 3273          DC    XL7'1183DFFF1C0000'
   2A2D 1283DDFF1C2000   2A33 3274          DC    XL7'1283DDFF1C2000'
   2A34 1383CDFF1C3200   2A3A 3275          DC    XL7'1383CDFF1C3200'
   2A3B 1483C5FF1C2200   2A41 3276          DC    XL7'1483C5FF1C2200'
   2A42 1583C1FF1C2A00   2A48 3277          DC    XL7'1583C1FF1C2A00'
   2A49 1603C1FF9C2E00   2A4F 3278          DC    XL7'1603C1FF9C2E00'
   2A50 1703C1FF0C2E00   2A56 3279          DC    XL7'1703C1FF0C2E00'
                              3280 *
   2A57 0983FFFF200000   2A5D 3281          DC    XL7'0983FFFF200000'
   2A5E 0983FFFF240000   2A64 3282          DC    XL7'0983FFFF240000'
   2A65 0983FFFF280000   2A6B 3283          DC    XL7'0983FFFF280000'
   2A6C 2183DFFF2C0000   2A72 3284          DC    XL7'2183DFFF2C0000'
   2A73 2283D7FF2C2000   2A79 3285          DC    XL7'2283D7FF2C2000'
   2A7A 2383D3FF2C2800   2A80 3286          DC    XL7'2383D3FF2C2800'
   2A81 2483D2FF2C2C00   2A87 3287          DC    XL7'2483D2FF2C2C00'
   2A88 2683D2FF2C2D00   2A8E 3288          DC    XL7'2683D2FF2C2D00'
                              3289 *
   2A8F 0883FFFF300000   2A95 3290          DC    XL7'0883FFFF300000'
   2A96 0983FFFF340000   2A9C 3291          DC    XL7'0983FFFF340000'
   2A9D 0983FFFF380000   2AA3 3292          DC    XL7'0983FFFF380000'
   2AA4 3183DFFF3C0000   2AAA 3293          DC    XL7'3183DFFF3C0000'
   2AAB 3283D7FF3C2000   2AB1 3294          DC    XL7'3283D7FF3C2000'
   2AB2 3383D3FF3C2800   2AB8 3295          DC    XL7'3383D3FF3C2800'
   2AB9 3483D2FF3C2C00   2ABF 3296          DC    XL7'3483D2FF3C2C00'
   2AC0 3583D2FF3C2D00   2AC6 3297          DC    XL7'3583D2FF3C2D00'
                              3298 *
   2AC7 0983FFFF400000   2ACD 3299          DC    XL7'0983FFFF400000'
   2ACE 0983FFFF440000   2AD4 3300          DC    XL7'0983FFFF440000'
   2AD5 0983FFFF480000   2ADB 3301          DC    XL7'0983FFFF480000'
   2ADC 4183FDFF4C0000   2AE2 3302          DC    XL7'4183FDFF4C0000'
   2AE3 4283F5FF4C0A00   2AE9 3303          DC    XL7'4283F5FF4C0A00'
   2AEA 4383E5FF4C0200   2AF0 3304          DC    XL7'4383E5FF4C0200'
   2AF1 4483E5FF4C1200   2AF7 3305          DC    XL7'4483E5FF4C1200'
                              3306 *
   2AF8 0A83FFFF500C00   2AFE 3307          DC    XL7'0A83FFFF500000'
   2AFF 0983FFFF540000   2B05 3308          DC    XL7'0983FFFF540000'
   2B06 0983FFFF580000   2B0C 3309          DC    XL7'0983FFFF580000'
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2B0D 5183FDFF5C0000   2B13 3310          DC    XL7'5183FDFF5C0000'
   2B14 5283FCFF5C0300   2B1A 3311          DC    XL7'5283FCFF5C0300'
   2B1B 5383FCFF5C0200   2B21 3312          DC    XL7'5383FCFF5C0200'
                              3313 *
   2B22 62837FFF600000   2B28 3314          DC    XL7'62837FFF600000'
   2B29 60837FFF608000   2B2F 3315          DC    XL7'60837FFF608000'
   2B30 6183FFFF640000   2B36 3316          DC    XL7'6183FFFF640000'
   2B37 6183FFFF680000   2B3D 3317          DC    XL7'6183FFFF680000'
   2B3E 6183FFFF6C0000   2B44 3318          DC    XL7'6183FFFF6C0000'
                              3319 *
   2B45 0983FFFF700000   2B4B 3320          DC    XL7'0983FFFF700000'
   2B4C 0983FFFF740000   2B52 3321          DC    XL7'0983FFFF740000'
   2B53 0983FFFF780000   2B59 3322          DC    XL7'0983FFFF780000'
   2B5A 7183FDFF7C0000   2B60 3323          DC    XL7'7183FDFF7C0000'
   2B61 7283FDFF7C0200   2B67 3324          DC    XL7'7283FDFF7C0200'
                              3325 *
```

```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

                        3327 *
                        3328 *-------------------------------------------------------------------
                        3329 *
   2B68                 3330          ORG   *,2,0           *** PROGRAM MAINTENANCE NOTE ***      03
                        3331 *                                  DDCF AND DDDF MUST START
                        3332 *                                  ON EVEN ADDRESS BOUNDARY
                        3333 *
                   2B68 3334 DDCF     EQU   *                 DDCF AREA
   2B68                 2B77 3335          DS    XL16
                        3336 *
                   2B78 3337 DDDF     EQU   *                 DDDF AREA
   2B78                 3B77 3338          DS    4096XL1                                          03
                        3339 *                                                                     03
   FF79                 3340          ORG   X'FFFF'-X'3BFE'+* FLAG IF OVERRUN X'3BFE'           03
                        3341 *                                  WHERE MICRO-CODE RESIDES         03
                        3342 *                                                                   03
```



```
ERR LOC OBJECT CODE     ADDR STMT SOURCE STATEMENT

                        3344 ***************************************************************************
                        3345 *                                                                         *
                        3346 *                          SYMBOL DEFINITIONS                             *
                        3347 *                                                                         *
                        3348 ***************************************************************************
                        3349 *
                        3350 *               LOCAL STORE REGISTERS
                        3351 *
                   0001 3352 XR1      EQU   X'01'             INDEX REGISTER 1
                   0002 3353 XR2      EQU   X'02'             INDEX REGISTER 2
                        3354 *
                   0004 3355 PSR      EQU   X'04'             PROGRAM STATUS REGISTER
                   0008 3356 ARR      EQU   X'08'             CURRENT LEVEL ADDRESS RECALL REG
                        3357 *
                   0020 3358 PIAR     EQU   X'20'             PROGRAM LEVEL INSTRUCTION ADDR REG
                        3359 *
                        3360 *-------------------------------------------------------------------------
                        3361 *               COMMON SENSE SWITCHES
                        3362 *
                   0004 3363 SSW05    EQU   X'04'             USE ALTERNATE PRINTER (3277 CRT)
                        3364 *
                        3365 *-------------------------------------------------------------------------
                        3366 *               SECTION SENSE SWITCHES
                        3367 *
                   0040 3368 SSW11    EQU   X'40'             INHIBIT TESTING ON DISK DRIVE 1
                   0020 3369 SSW12    EQU   X'20'             INHIBIT TESTING ON DISK DRIVE 2
                        3370 *
                   0020 3371 SSW1A    EQU   X'20'             USE DRIVE 1 ONLY
                   0010 3372 SSW1B    EQU   X'10'             USE DRIVE 2 ONLY
                        3373 *
                   0040 3374 SSW21    EQU   X'40'             INHIBIT WRITE TESTING ON DRIVE 1
                   0020 3375 SSW22    EQU   X'20'             INHIBIT WRITE TESTING ON DRIVE 2
                        3376 *
                   0001 3377 SSW2F    EQU   X'01'             ENABLE AMOP (SECTION C19)
                        3378 *
                        3379 *-------------------------------------------------------------------------
                        3380 *               MESSAGE / HALT IDENTIFIERS
                        3381 *
                   C100 3382 HLT00    EQU   X'C100'           NO HALT
                   C101 3383 HLT01    EQU   X'C101'           COMMON 3340 ERROR HALT
                   C1E2 3384 HLTE2    EQU   X'C1E2'           SSW 11-12 OR 1A-1B INVALID           02
                   C1E4 3385 HLTE4    EQU   X'C1E4'           SELECT DRIVE TO BE INITIALIZED
                        3386 *
                        3387 *-------------------------------------------------------------------------
                        3388 *               COMMON PROGRAM INDICATORS (IND)
                        3389 *
                   0080 3390 HUNG     EQU   X'80'             HANG CONDITION OCCURRED
                   0040 3391 HLTSW    EQU   X'40'             ERROR HALT AFTER TESTING ALL DRIVES
                   0020 3392 INTERR   EQU   X'20'             ERROR DETECTED IN 3340 INTERRUPT RTN
                   0010 3393 DRVERR   EQU   X'10'             UNIT CHECK DETECTED IN INTRP RTN
                   0008 3394 TIOERR   EQU   X'08'             TIO INTRP PENDING FAILED
                   0004 3395 OPEND    EQU   X'04'             OP END INTERRUPT EXPECTED
                   0002 3396 SKEND    EQU   X'02'             SEEK COMPLETE INTERRUPT EXPECTED
                   0001 3397 SNSAVL   EQU   X'01'             READ SENSE DATA AVAILABLE
                        3398 *
                        3399 *-------------------------------------------------------------------03
                        3400 *               COMMON PROGRAM INDICATORS (IND2)                    03
                        3401 *                                                                   03
                   0080 3402 DDDFER   EQU   X'80'             RESIDUAL DDDF ERROR INDCATOR        03
                        3403 *-------------------------------------------------------------------
                        3404 *               DRIVE DEPENDENT INDICATORS (DIND)
                        3405 *
                   0080 3406 CEDM     EQU   X'80'             CE DATA MODULE MOUNTED
                   0040 3407 LPSW     EQU   X'40'             DRIVE LOOP INDICATOR
                   0020 3408 HAEDEF   EQU   X'20'             DEFECTIVE EVEN HOME ADDRESS
                   0010 3409 HAODEF   EQU   X'10'             DEFECTIVE ODD HOME ADDRESS
                   0008 3410 NOWR     EQU   X'08'             INHIBIT WRITE TESTING
                   0001 3411 SW       EQU   X'01'             GENERAL PURPOSE PROGRAM INDICATOR
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3412 *
                         3413 *-------------------------------------------------------------------
                         3414 *              3340 PROGRAM COMMUNICATION AREA (COM) INDICATORS
                         3415 *
                    0080 3416 ADRSTP   EQU   X'80'            MICROPROCESSOR ADDR STOP ENABLED
                    0020 3417 MPLFLG   EQU   X'20'            MICRO-PROGRAM LOADED
                    0001 3418 AMOPSW   EQU   X'01'            AMOP IN EXECUTION INDICATOR
                         3419 *
                         3420 *-------------------------------------------------------------------
                         3421 *              BIT POSITION SYMBOLS
                         3422 *
                    0040 3423 BIT1     EQU   X'40'
                    0010 3424 BIT3     EQU   X'10'
                    0008 3425 BIT4     EQU   X'08'
                    0004 3426 BIT5     EQU   X'04'
                    0002 3427 BIT6     EQU   X'02'
                    0001 3428 BIT7     EQU   X'01'
                         3429 *
                         3430 *-------------------------------------------------------------------
                         3431 *              DCP SECTION REFERENCE TABLE
                         3432 *
                    0208 3433 SBYTE0   EQU   X'0208'          COMMON SENSE SWITCHES   00-07
                    0209 3434 SBYTE1   EQU   X'0209'          COMMON SENSE SWITCHES   08-0F
                    020A 3435 SBYTE2   EQU   X'020A'          SECTION SENSE SWITCHES  10-17
                    020B 3436 SBYTE3   EQU   X'020B'          SECTION SENSE SWITCHES  18-1F
                    020C 3437 SBYTE4   EQU   X'020C'          SECTION SENSE SWITCHES  20-27
                    020D 3438 SBYTE5   EQU   X'020D'          SECTION SENSE SWITCHES  28-2F
                         3439 *
                    0212 3440 TEST     EQU   X'0212'          CHECK CE CONSOLE SWITCHES
                    0216 3441 LINK     EQU   X'0216'          LINK TO NEXT ROUTINE OR SECTION
                    021A 3442 PRINT    EQU   X'021A'          PRINT A MESSAGE
                    021E 3443 UNPACK   EQU   X'021E'          UNPACK DATA - HEX TO EBCDIC
                    0222 3444 HALT     EQU   X'0222'          HALT AND DISPLAY HALT IDENTIFIER
                    022A 3445 LOAD     EQU   X'022A'          LOAD NEXT SECTION OR RECORD
                         3446 *
                    0232 3447 UTAB     EQU   X'0232'          DCP UDT TABLE
                         3448 *
                         3449 *-------------------------------------------------------------------
                         3450 *              OTHER REFERENCES EXTERNAL TO THIS SECTION
                         3451 *
                    4000 3452 AMOP     EQU   X'4000'          ADAPTER MANUAL OPERATIONS PROGRAM
                    6C00 3453 LDR      EQU   X'6C00'          3340 MICROCODE LOADER PGM - MOD 12
                         3454 *
                         3455 *-------------------------------------------------------------------
                         3456 *              MISCELLANEOUS
                         3457 *
                    0D89 3458 PTR1     EQU   R09H+3           POINTER 1
                    0D8B 3459 PTR2     EQU   R09H+5           POINTER 2
                    2883 3460 DLY256   EQU   SCN              DELAY COUNT FOR 256 MILLI-SEC
                         3461 *
                    FFFF 3462          END
```


CROSS-REFERENCE

```
SYMBOL   T LEN VALUE DEFN  REFERENCES
ABEND    A 004 1580  1427  1411
ACT      A 004 2934  3177  0232* 0308* 0412* 0507* 2509
ACTABL   A 001 297E  3247  1128
ADRPTR   A 002 2901  3154  1289* 1337  1345* 1350* 2584
ADRSTP   C 001 0080  3416  2783
ADRTBL   A 001 2902  3156  1008  1097  1254  1288  1349
AMOP     C 001 4000  3452  2705  2724
AMOPGO   A 004 2062  2724  2706
AMOPID   A 002 0A1E  0032  2702
AMOPLD   A 004 2047  2708  2703
AMOPLK   A 004 201C  2692  1237  1400  2006  2102
AMOPSW   C 001 0001  3418  1236
AMOPX    A 004 206E  2729  2692* 2695
AMOPX1   A 004 2066  2726  2697*
AMOPX2   A 004 206A  2727  2698*
ARR      C 001 0008  3356  1225  1449  1466  1549  1561  1589  1619  1642  1663  1702  1734  1748
                            1777  1789  1805  1825  1854  1866  1897  1909  1921  1944  1956  1968
                            1983  2413  2581  2639  2682  2692  2738  2774  2822
BEGIN    A 004 1382  1225  0051  0085  0121  0156  0200  0267  0339  0375  0447  0550  0648  0735
                            0804  0857  1004  1093
BGNX     A 004 1492  1318  1232* 1389
BGN01    A 003 13CB  1234  1372
BGN02    A 006 13FE  1252  1304
BGN03    A 004 142A  1271  1258  1267
BGN06    A 003 144C  1286  1273  1282
BGN07    A 003 1474  1306  1293
BIT1     C 001 0040  3423  0610  0622  0681  0704  0762  0777
BIT3     C 001 0010  3424  1124  2400  2592
BIT4     C 001 0008  3425  2610
BIT5     C 001 0004  3426  1407  2036  2400
BIT6     C 001 0002  3427  1758
BIT7     C 001 0001  3428  0628  0669  0684  0710  0711  0786  1118  1407  1410  2140  2194  2338
                            2349  2378  2407  2586  2796
C        A 002 286D  3108  2831
CC       A 002 2948  3205  1519*
CC2      A 002 295E  3232
CEDM     C 001 0080  3406  1405  1490  1760
CEMODE   A 002 287B  3115  1031  1035  1242  2805
CMD      A 005 28F0  3147  1451* 1469* 1551* 1563* 1591* 1621* 1644* 1665* 1704* 1736* 1750* 1779*
                            1791* 1807* 1827* 1856* 1868* 1899* 1911* 1923* 1946* 1958* 2439
CODE     A 001 2935  3178  1155* 1159
03 COM   A 001 0A19  0028  0908* 1236  1239  1432* 2700  2754  2783
03 CR    A 002 286F  3109  2833* 2834  2838* 2839
03 CYL   A 007 28F7  3148  1458* 1473* 1478* 1526* 2440
03 C12   A 001 0000  0007
03 C17   A 002 20A6  2758  2742  2745
03 C19   A 002 2057  2716  2702  2705
03 DASDI A 004 1F42  2581  2008  2086
   DASDIX A 004 1FB1  2624  2581*
   DASDX2 A 004 1FAD  2622  2582* 2618
   DASD01 A 004 1F83  2605  2594
   DASD02 A 005 1F8B  2608  2603
   DASD03 A 004 1F9B  2613
   DASD04 A 004 1F9F  2615  2587  2599
   DASD05 A 003 1FA3  2617
   DASD06 A 003 1FAA  2620  2601* 2605* 2611
   DDCF   A 001 2868  3334  3081
   DDCR   A 002 2847  3081  1249  1368
   DDDF   A 001 2878  3337  0565* 0566  0566* 0567* 0601* 0663* 0664  0664* 0665* 0666* 0667* 0672
                            0672* 0687  0692  0707  0750* 0751  0751* 0752* 0753* 0765  0780  1040*
                            3082
   DDDFER C 001 0080  3402  0233  0303  0413  0508  2499
   DDDR   A 002 2849  3082  0918  0951  0966  1250  1369
   DELAY  A 004 2108  2801  2797
   DGSNS  A 001 2966  3241  1124  1125  1130  1131  1132  1133  2002* 2232* 2233  2233* 2235* 2237*
                            2238* 2393  2395  2539  2544  2549  2554  2559  2564  3078
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
DGSNS@	A	002	2843	3078	1115 2354 2358
DIND	A	001	293A	3190	0278 0343 0382 0454 0815 1264* 1269* 1279* 1284* 1306* 1387 1388* 1405* 1490 1760*
DIND2	A	001	2950	3217	
DL	A	002	294E	3209	0223 0299 0403 1039* 1061* 1576* 1601 1608 1633* 1680 1687 1709* 1798* 1814 1841 1882
DLYLP	A	004	210C	2802	2803
DLY256	A	002	2883	3460	0939
DL2	A	002	2964	3236	
DRV	A	001	293B	3192	2438
DRVADR	A	001	293C	3193	1117 1986 1988 1989 2348
DRVAD2	A	001	2952	3220	
DRVERR	C	001	0010	3393	1375 2388 2613
DRVWK	A	001	293A	3184	0038
DRVWK1	A	001	293A	3188	1260
DRVWK2	A	001	2950	3215	1275
DRV2	A	001	2951	3219	
DST	A	002	2889	3124	
DXC	A	002	2885	3122	
D1	A	001	280C	3049	1413 1478 1483 1526 1531
EMXX	A	001	249E	2949	
EMXXN	A	006	24A3	2950	2420
EM0A	A	001	25F2	2982	
EM0AN	A	031	2610	2983	2202
EM0C	A	001	2611	2985	
EM0CN	A	018	2622	2986	2209
EM0D	A	001	2623	2988	
EM0DN	A	025	263B	2989	2217
EM0E	A	001	263C	2991	
EM0EN	A	043	2666	2992	2223
EM0F	A	001	2667	2994	
EM0FN	A	023	26A6	2996	2230
EM00	A	001	24A4	2952	
EM00N	A	008	24AB	2953	2116
EM01	A	001	24AC	2955	
EM01N	A	039	24D2	2956	2122
EM02	A	001	24D3	2958	
EM02N	A	032	24F2	2959	2128 2134
EM03	A	001	24F3	2961	
EM03N	A	009	24FB	2962	2135
EM04	A	001	24FC	2964	
EM04N	A	031	251A	2965	2115 2149
EM05	A	001	251B	2967	
EM05N	A	046	2548	2968	2155
EM06	A	001	2549	2970	
EM06N	A	042	2572	2971	2161
EM07	A	001	2573	2973	
EM07N	A	041	259B	2974	2167
EM08	A	001	259C	2976	
EM08N	A	045	25C8	2977	2173
EM09	A	001	25C9	2979	
EM09N	A	041	25F1	2980	2187
EM1A	A	001	27B9	3028	
EM1AN	A	026	27D2	3029	2316
EM10	A	001	26A7	2998	
EM10N	A	024	26BE	2999	2252
EM11	A	001	26BF	3001	
EM11N	A	031	26DD	3002	2259
EM12	A	001	26DE	3004	
EM12N	A	044	2709	3005	2265
EM13	A	001	270A	3007	
EM13N	A	038	272F	3008	2271
EM14	A	001	2730	3010	
EM14N	A	042	2759	3011	2277
EM15	A	001	275A	3013	
EM15N	A	040	2781	3014	2283

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
EM16	A	001	2782	3016	
EM16N	A	028	279D	3017	2289 2295 2302 2309
EM17	A	001	279E	3019	
EM17N	A	009	27A6	3020	2296
EM18	A	001	27A7	3022	
EM18N	A	009	27AF	3023	2303
EM19	A	001	27B0	3025	
EM19N	A	009	27B8	3026	2310
EM20	A	001	27D3	3031	
EM20N	A	020	27E6	3032	2322
EM30	A	001	27E7	3034	0978
EM30A	A	008	27EE	3035	0909* 0949* 0964* 0969* 0971
EM30N	A	019	2801	3036	0978 0979
ERRCNT	A	001	28FF	3152	1247* 1325 1328 1335* 1402 1413* 1415 1423*
ERRPRT	A	004	1E12	2418	1403
ERRPX	A	004	1F3E	2572	2418* 2523
ERRP01	A	004	1E2F	2431	
ERRP02	A	004	1EE5	2522	2500
ERRXX	A	003	1D26	2328	2011 2092 2156 2254 2260 2266 2272 2278 2284 2317
ERRXXA	A	004	1D3D	2338	2331 2334
ERRXXB	A	005	1D5B	2348	2342
ERRXXC	A	004	1DB1	2377	
ERRXXD	A	004	1DC1	2383	2346
ERRXXE	A	004	1DF2	2400	2389
ERRXXF	A	006	1DA3	2373	2375
ERRXXG	A	004	1E02	2406	2374
ERR0A	A	006	1C35	2202	2392 2394 2396
ERR0C	A	006	1C3F	2208	2141 2195 2339
ERR0D	A	006	1C54	2217	2404
ERR0E	A	006	1C5E	2223	2402
ERR0F	A	006	1C68	2229	2379 2408
ERR0FA	A	004	1C74	2232	2212
ERR00	A	006	1B8D	2115	2020 2027 2362
ERR01	A	006	1B9C	2122	2013 2369
ERR02	A	006	1BA5	2128	2033
ERR03	A	006	1BAE	2134	2036 2359
ERR03A	A	003	1B6A	2137	2129
ERR04	A	006	1BCC	2148	2056
ERR05	A	006	1BDB	2155	2049
ERR06	A	006	1BE5	2161	2059
ERR07	A	006	1BEE	2167	2064
ERR08	A	006	1BF7	2173	2072
ERR08A	A	006	1BFD	2175	2162 2168
ERR08B	A	004	1C03	2177	2180
ERR08C	A	003	1C14	2182	2178
ERR09	A	006	1C17	2187	2077 2351 2410
ERR09A	A	004	1C1D	2189	2150 2182
ERR09B	A	004	1C25	2192	2117 2123
ERR1A	A	006	1D13	2316	0763 0778
ERR10	A	004	1C98	2247	2084
ERR11	A	006	1CAC	2259	2250
ERR12	A	006	1CB5	2265	2247
ERR13	A	006	1CBE	2271	0611 0623 0682 0705
ERR14	A	006	1CC7	2277	0608 0620 0679 0702 0760 0775
ERR15	A	006	1CD0	2283	0573 0581 0589 0597
ERR16	A	006	1CD9	2289	1537 1582 1612 1693 1725 1767 1818 1845 1888 1935
ERR17	A	006	1CE3	2295	2098
ERR18	A	006	1CF3	2302	0224 0300 0404 1540 1573 1602 1679 1681 1720 1722 1770 1815 1842 1883
ERR19	A	006	1D03	2309	0235 0311 0415 0510 0688 0693 0708 0766 0781
ERR20	A	006	1D1C	2322	2398
EXP	A	004	2930	3176	0231* 0307* 0411* 0506* 2504
EXTBL	A	001	287E	3118	2825
FAGID	A	002	0A20	0033	
FF	A	001	2946	3204	
FFPTN	A	001	2835	3068	0687 0692 0765

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
FF2	A	001	295C	3231	
FHF	A	002	288D	3126	
FTG	A	002	2887	3123	
FTR	A	002	287F	3119	
HAEDEF	C	001	0020	3408	
HALT	C	001	0222	3444	0982 1019 1110 1208 1301 1358 1434
HAODEF	C	001	0010	3409	
HD	A	005	28FC	3149	1459* 1474* 1483* 1531* 2441
HH	A	002	294A	3206	1520* 1542 1797*
HH2	A	002	2960	3233	
HLTE2	C	001	C1E2	3384	1299 1302
HLTE4	C	001	C1E4	3385	1017 1020 1108 1111
HLTSW	C	001	0040	3391	1355 1361 1424
HLT00	C	001	C100	3382	2712 2722 2752
HLT01	C	001	C101	3383	0980 0983 1186 1209 1359 1435 2429
HUNG	C	001	0080	3390	0921 0928 2019 2026 2055 2361 2368 2657 2672
IDDCF	A	001	2913	3165	
IDDCFN	A	010	291C	3166	1539 1769 1992* 2467
IDDCR	A	002	290C	3159	0172* 1249* 1368* 1994 2016 2032 2094 2097 2422 2457
IDDDR	A	002	290E	3160	0060* 0173* 0226 0241 0242* 0302 0317 0318* 0406 0421 0422* 0468 0476* 0482* 0498 0669 0684 0710 0711* 1053 1250* 1369* 1536 1575 1606 1685 1724 1757 1762 1817 1844 1887 1934 2023 2035 2462
IND	A	001	28E4	3139	0921 0928 1245* 1355 1361* 1374* 1375* 1424* 2010 2019 2026 2041* 2046* 2047* 2055 2063 2068 2088 2091 2177 2240* 2249 2330 2361 2368 2381* 2383 2388 2522 2593 2598 2602* 2606* 2613* 2615* 2657* 2672*
IND2	A	001	28E5	3140	0233* 0309* 0413* 0508* 1246* 2499
INTERR	C	001	0020	3392	1375 2010 2091 2330 2383 2615
INTVL	A	001	2841	3076	
K	A	001	2861	3100	1311 1380 2782* 2785*
KL	A	001	294C	3208	1607 1686
KL2	A	001	2962	3235	
K024	A	002	2868	3107	2829
K034	A	002	2869	3106	2828
K04	A	002	2867	3105	2827
LALUD	A	002	2877	3113	2845
LDR	C	001	6C00	3453	2745 2760
LDRGO	A	004	20A7	2760	2746
LDRID	A	002	0A1C	0031	2742
LDRLD	A	004	2090	2748	2743
LEXT	A	002	2879	3114	2846
LEXTAR	A	002	2875	3112	2844
LEXTZ	A	002	2873	3111	2836
LINK	C	001	0216	3441	0070 0106 0141 0185 0252 0326 0360 0432 0534 0633 0719 0791 0839 0891
LINKID	A	002	28E6	3143	1399 2005 2101
LIO	A	004	1A9E	2016	2651
LOAD	C	001	022A	3445	0988 1079 1213 1437 2714 2756
LOOP	A	006	14EE	1368	0068 0104 0139 0183 0250 0324 0430 0532 0631 0717 0789 0889 1075 1347 1416
LOOPX	A	004	1531	1391	1228*
LPCNT	A	002	28FE	3151	0049* 0067* 0265* 0323* 0646* 0716* 0855* 0870 0887* 0888
LPSW	C	001	0040	3407	1306 1387 1388 1405
MINIT	A	014	248F	2946	
MPL	A	004	2072	2738	0986 1240
MPLFLG	C	001	0020	3417	0908 1239 1432
MPLX	A	004	20B3	2765	2738*
MPLX1	A	004	20AB	2762	2739*
MPLX2	A	004	20AF	2763	2740*
MRDCKD	A	005	242C	2928	1621
MRDDGN	A	005	2431	2929	1644
MRDHAE	A	005	241D	2925	1551
MRDHAD	A	005	2422	2926	1563
MRDIPL	A	005	244A	2934	
MRDKD	A	005	2436	2930	1665
MRDLOG	A	005	2440	2932	1736

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
MRDROO	A	005	2427	2927	1591
MRDSNS	A	005	2445	2933	1750
MRDVKD	A	005	243B	2931	1704
MRECAL	A	005	2413	2923	1451
MSCANE	A	005	2472	2942	1911
MSCANH	A	005	2477	2943	1923
MSCNRE	A	005	247C	2944	1946
MSCNRH	A	005	2481	2945	1958
MSEEK	A	005	2418	2924	1469
MSG	A	001	2893	3134	2438* 2439* 2440* 2441* 2446 2451 2453* 2458 2463 2468 2477* 2482 2487 2492 2540 2545 2550 2555 2560 2565
MSGA	A	006	2898	3135	2115* 2116* 2122* 2128* 2134* 2135* 2149* 2155* 2161* 2167* 2173* 2187* 2202* 2209* 2217* 2223* 2230* 2252* 2259* 2265* 2271* 2277* 2283* 2289* 2295* 2296* 2302* 2303* 2309* 2310* 2316* 2322* 2420*
MSGN	A	074	28E2	3136	1997 1997* 2148 2148* 2208 2208* 2229 2229* 2386 2386* 2428 2436 2436* 2473 2475 2475* 2497 2525 2525* 2570
MSGOA	A	001	22AD	2891	1015 1106
MSGOAB	A	033	22CD	2892	1102
MSGOAN	A	045	22FC	2894	1015 1016 1106 1107
MSGOB	A	001	22FD	2896	2534
MSGOBN	A	026	2331	2898	2534 2535
MSGO1	A	001	2186	2863	2750
MSGO1N	A	019	2198	2864	2750 2751
MSGO2	A	001	2199	2866	2710
MSGO2N	A	019	21AB	2867	2710 2711
MSGO3	A	001	21AC	2869	2720
MSGO3N	A	017	21BC	2870	2720 2721
MSGO4	A	001	21BD	2872	1297
MSGO4N	A	042	21E6	2873	1297 1298
MSGO5	A	001	21E7	2875	1328* 1332
MSGO5N	A	025	21FF	2876	1332 1333
MSGO6	A	001	2200	2878	1429
MSGO6N	A	050	2231	2879	1429 1430
MSGO7	A	001	2232	2881	1420
MSGO7N	A	028	224D	2882	1420 1421
MSGO8	A	001	224E	2884	2433
MSGO8N	A	020	2292	2886	2433 2434
MSGO9	A	001	2293	2888	2529
MSGO9N	A	026	22AC	2889	2529 2530
MSG10	A	001	2332	2900	1184
MSG10N	A	030	234F	2901	1160 1184 1185
MSG11	A	001	2350	2903	1190
MSG11N	A	029	236C	2904	1165 1190 1191
MSG12	A	001	236D	2906	1195
MSG12N	A	029	2389	2907	1170 1195 1196
MSG13	A	001	238A	2909	1200
MSG13N	A	029	23A6	2910	1175 1200 1201
MSG14	A	001	23A7	2912	1205
MSG14N	A	029	23C3	2913	1180 1205 1206
MSG15	A	001	23C4	2915	2514
MSG15N	A	034	23E5	2916	2505 2514 2515
MSG16	A	001	23E6	2918	2519
MSG16N	A	034	2407	2919	2510 2519 2520
MTEST	A	014	249D	2947	1102
MWRCCD	A	005	2463	2939	1856
MWRCKD	A	005	245E	2938	1827
MWRHAE	A	005	244F	2935	1779
MWRHAD	A	005	2454	2936	1791
MWRKD	A	005	246D	2941	1899
MWRREP	A	005	2468	2940	1868
MWRROO	A	005	2459	2937	1807
NN	A	001	294F	3210	1456* 1501* 1568* 1597* 1626* 1649* 1672* 1676 1688* 1713* 1717 1796* 1854* 1838 1839* 1875* 1879 1880* 1930* 1992 1995
NN2	A	001	2965	3237	
NORMN	A	004	11E6	0988	0906
NOWR	C	001	0008	3410	0278 0343 0382 0454 0815 1269 1284

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
NULLS	A	001	280B	3047	0667 0852 1040 1308 1377 1456 1501 1568 1626 1709 1796 1999 2000 2002 2175 2333
NXDRV	A	003	1496	1323	0065 0099 0134 0178 0245 0279 0321 0344 0358 0383 0425 0455 0527 0625 0714 0783 0816 0837 0883 1070 1425 1496
NXDRVX	A	004	14EA	1363	1229* 1356
NXD01	A	004	14B2	1337	1326
NXD02	A	004	14CA	1349	1340
N1	A	002	2831	3066	1476 1481 1524 1529 1688
OPEND	C	001	0004	3395	1374 2041 2046 2088 2177 2249 2593 2606
ORIENT	A	004	1A29	1968	0213 0218 0283 0288 0294 0563 0575 0583 0591 0599 0613 0661 0695 0748 0768
ORINTX	A	004	1A39	1974	1968*
PA	A	004	2945	3202	1542* 1572 1797
PATRN	A	001	283A	3072	0547* 0548* 0567 0627 0627* 0628* 0630 0732* 0733* 0752 0785 0785* 0786* 0788
PA2	A	004	295B	3229	
PFC	A	002	0A07	0020	
PIAR	C	001	0020	3358	
PID	A	002	0A01	0016	0854 0985
PRINT	C	001	021A	3442	0976 1013 1104 1182 1188 1193 1198 1203 1295 1330 1418 1427 2425 2431 2470 2494 2512 2517 2527 2532 2567 2708 2718 2748
PSR	C	001	0004	3355	
PTR1	A	006	0DB9	3458	0485* 0494* 0504 0515*
PTR2	A	006	0DBB	3459	0494 0498* 0499* 0505 0517*
P1	A	003	280F	3051	0067 0101 0136 0180 0247 0323 0427 0519 0529 0716 0887 0933 0941 1072 1504 1635 1656 1971 2076 2083 2179 2373 2793 2798 2802
P10	A	002	281F	3057	0522
P1200	A	002	282D	3063	0952
P2	A	002	2811	3052	1695 1727 1847 1890 1937
P20	A	002	2821	3058	1513 1516
P256	A	004	2827	3060	0223 0299 0403 0476 0482 1054 1061
P3	A	002	2813	3053	0499
P349	A	002	2829	3061	0874
P4	A	002	2815	3054	0238 0314 0418 0473 0515 0517 1058
P4092	A	002	282F	3064	0469
P5	A	004	2819	3055	
P640	A	002	282B	3062	0496
P8	A	004	281D	3056	1039 1798
P80	A	002	2823	3059	0955
Q	A	001	2940	3199	1453* 1498* 1553* 1565* 1593* 1623* 1646* 1667* 1706* 1738* 1752* 1781* 1793* 1809* 1829* 1858* 1870* 1901* 1913* 1925* 1948* 1960* 2038 2043 2391
Q2	A	001	2956	3226	
R	A	001	2941	3200	1454* 1499* 1554* 1566* 1594* 1624* 1647* 1668* 1707* 1739* 1753* 1782* 1794* 1810* 1830* 1859* 1871* 1902* 1914* 1926* 1949* 1961* 1985
RDCKD	A	004	1741	1619	0169 0215 0220 0285 0296 0393 0400 0461 0822 1046 1067
RDDCF	A	001	291D	3168	0238* 0314* 0418* 1572 1601 1633 1678 1680 1719 1721 1814 1841 1882
RDDCFN	A	010	2926	3169	1539 1769 2095* 2423* 2491
RDDCR	A	002	2910	3162	1999* 2029* 2032 2080* 2097 2189* 2481
RDDDR	A	002	2912	3163	0944* 0946 0958 0961 0966 1536 1581 1611 1692 1724 1766 1817 1844 1887 1934 2000* 2030* 2035 2081* 2190* 2486
RDDGN	A	004	1771	1642	
RDHAE	A	004	16AD	1549	0091 0097 0132 0167 0211 0281 0353 0389 0561 0659 0746 0818 0868 0881
RDHAO	A	004	16C0	1561	0175 0356
RDHAOA	A	005	16D0	1568	1556
RDHAOX	A	004	16FB	1584	1549* 1561*
RDKD	A	004	179A	1663	0487
RDKDA	A	004	17AA	1670	1904
RDKDB	A	003	17D6	1686	1689
RDKDX	A	004	17F9	1697	1663* 1670 1695* 1897*
RDLOG	A	004	184B	1734	0058 0063
RDR00	A	004	16FF	1589	0176 1051
RDR00A	A	005	1719	1601	1637 1658

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RDROOX	A	004	173D	1614	1589* 1619* 1628 1635* 1642* 1651 1656*
RDSNS	A	004	1863	1748	0057 0062 0090 0126 0161 0205 0272 0347 0380 0452 0555 0653 0740 0809 0862 1025
RDSNSA	A	004	1884	1762	1743 1759
RDSNSX	A	004	18A3	1772	1734* 1748*
RDVKD	A	004	17FD	1702	0833
RDVKDX	A	004	1847	1729	1702* 1711 1727*
RECAL	A	004	1597	1449	0055 0089 0125 0160 0204 0271 0346 0379 0451 0554 0652 0739 0808 0861 1024
REGLP	A	004	214A	2833	2851
REGRST	A	004	212E	2822	0915 0974 2778
REGX	A	004	2182	2854	2822*
REGX1	A	004	217E	2853	2823*
RELOAD	A	006	11DC	0985	0972
RETRY	A	003	1535	1396	2143 2197 2203 2218 2224 2242 2290 2297 2304 2311 2323 2384
REZERO	A	007	240E	2921	1458 1459 1473 1474
RR	A	001	294B	3207	1596* 1604* 1629* 1652* 1671* 1676* 1683* 1712* 1717* 1721 1833* 1838* 1874* 1879* 1885* 1929*
RR2	A	001	2961	3234	
RSTAX	A	004	200A	2675	2655*
RSTBR	A	001	1FFD	2665	2659
RSTLP	A	005	20DA	2787	2784 2791
RSTOR	A	004	200E	2682	0919 0926 2017 2024 2053 2355 2366
RSTORX	A	004	2018	2684	2682*
RSTRT	A	004	1FFE	2672	2664
RSTX	A	004	212A	2813	2774*
RSTXR1	A	004	2006	2674	2640* 2661
RSTXR2	A	004	2002	2673	2641*
RSTX1	A	004	2122	2810	2775*
RSTX2	A	004	2126	2811	2776*
RTN	A	001	0A03	0018	
RTN0A	A	001	0E20	0543	0443
RTN0B	A	001	0EE3	0642	0545
RTN0C	A	001	0FAA	0728	0644
RTN0D	A	001	1049	0800	0730
RTN0E	A	001	1092	0848	0802
RTN0F	A	001	1103	0900	0850
RTN01	A	001	0A3A	0045	0020
RTN02	A	001	0A74	0079	0047
RTN03	A	001	0AB1	0115	0081
RTN04	A	001	0AEA	0150	0117
RTN05	A	001	0B38	0194	0152
RTN06	A	001	0BC4	0261	0196
RTN07	A	001	0C5D	0335	0263
RTN08	A	001	0C93	0369	0337
RTN09	A	001	0D28	0441	0371
RTN10	A	001	11E8	0998	0902
RTN11	A	001	12A5	1089	1000
RUNMP	A	002	2864	3102	1312 1381
R0A	A	006	0E24	0547	
R0AA	A	004	0E36	0554	
R0AB	A	004	0E45	0561	0551
R0AB1	A	004	0EA7	0610	0607
R0AB2	A	004	0EC1	0622	0619
R0AC	A	006	0ECD	0627	0552
R0B	A	004	0EE7	0646	
R0BA	A	004	0EF3	0652	
R0BB	A	004	0F02	0659	0649 0712
R0BB1	A	004	0F33	0674	0670
R0BB2	A	004	0F41	0681	0678
R0BB3	A	006	0F5E	0692	0685
R0BB4	A	004	0F68	0695	0690
R0BB5	A	004	0F7A	0704	0701
R0BC	A	006	0F9C	0716	0650
R0C	A	006	0FAE	0732	
R0CA	A	004	0FC0	0739	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ROCB	A	004	OFCF	0746	0736
ROCB1	A	004	OFF9	0762	0759
ROCB2	A	004	101D	0777	0774
ROCC	A	006	1033	0785	0737
ROD	A	004	104D	0804	
RODA	A	004	1055	0808	
RODB	A	003	1064	0815	0805
RODC	A	004	108E	0839	0806
ROE	A	006	1096	0852	
ROEA	A	004	10AC	0861	
ROEA1	A	002	10BA	0866	0852* 0871 0885*
ROEB	A	004	10BF	0870	0858
ROEB1	A	005	10C9	0872	0875
ROEB2	A	002	10E2	0879	0871* 0872* 0873* 0874 0885
ROEC	A	006	10EB	0885	0859
ROFA	A	006	1155	0933	0935
ROFB	A	004	1188	0951	0947
ROFC	A	004	11C1	0971	0959 0962 0967
ROFD	A	004	1163	0937	0922 0929 0934
ROFE	A	006	116D	0941	0942
RO1	A	004	0A3E	0049	
RO1A	A	004	0A4E	0057	0052
RO1B	A	006	0A66	0067	0053
RO2	A	004	0A78	0083	
RO2A	A	004	0A84	0089	0086
RO2A1	A	001	0A94	0094	0083* 0101* 0103
RO2B	A	006	0A9F	0101	0087
RO3	A	004	0AB5	0119	
RO3A	A	004	0AC1	0125	0122
RO3A1	A	001	0ACD	0129	0119* 0136* 0138
RO3B	A	006	0AD8	0136	0123
RO4	A	004	0AEE	0154	
RO4A	A	004	0AFA	0160	
RO4B	A	004	0B02	0163	0157
RO4B1	A	001	0B06	0164	0154* 0180* 0182
RO4C	A	006	0B26	0180	0158
RO5	A	004	0B3C	0198	
RO5A	A	004	0B48	0204	
RO5B	A	004	0B50	0207	0201
RO5B1	A	001	0B54	0208	0198* 0247* 0249
RO5B2	A	004	0B57	0211	0243
RO5B3	A	005	0B7A	0228	0239
RO5C	A	006	0B82	0247	0202
RO5D	A	003	0B95	0237	0229
RO6	A	004	0BC8	0265	
RO6A	A	004	0BD4	0271	
RO6B	A	003	0BE3	0278	0268 0319
RO6B1	A	004	0BF2	0285	
RO6B2	A	005	0C17	0304	0315
RO6C	A	006	0C4F	0323	0269
RO6D	A	003	0C32	0313	0305
RO7A	A	003	0C69	0343	0340
RO7B	A	004	0C8F	0360	0341
RO8	A	004	0C97	0373	
RO8A	A	004	0CA3	0379	
RO8B	A	003	0CAB	0382	0376
RO8B1	A	001	0CB6	0386	0373* 0427* 0429
RO8B2	A	004	0CC1	0393	0423
RO8B3	A	005	0CDE	0408	0419
RO8C	A	006	0D16	0427	0377
RO8D	A	003	0CF9	0417	0409
RO9	A	004	0D2C	0445	
RO9A	A	004	0D38	0451	
RO9B	A	003	0D40	0454	0448
RO9C	A	006	0EDE	0529	0449
RO9D	A	001	0D4B	0458	0445* 0529* 0531

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
RO9E	A	001	0D95	0488	0484* 0491 0512 0522* 0524
RO9F	A	005	0D63	0471	0474
RO9G	A	004	0D91	0487	0525
RO9H	A	006	0DB6	0501	0520 3458 3459
RO9I	A	006	0DEC	0517	0513
RO9J	A	006	0DA4	0496	0492
RO9K	A	004	0DDF	0512	0502
RO9L	A	006	0DCB	0506	0504*
RO9M	A	006	0DD1	0507	0505*
R10	A	004	11EF	1002	1022
R10A	A	004	11FB	1008	1005
R10B	A	004	1219	1024	1009
R10B1	A	001	1225	1028	1002* 1072* 1074
R10E1	A	005	1268	1056	1059
R10F	A	006	128E	1072	1006
R11	A	004	12A9	1093	1113
R11A	A	004	12D5	1115	1094 1095 1098
R11B	A	004	12F4	1128	
R11M	A	006	12F6	1130	
R11P	A	004	1325	1141	1137*
R11Q	A	004	1329	1142	1138*
R11R	A	004	132D	1143	1139*
R11S	A	005	1347	1155	1149
R11T	A	006	1310	1135	1153
R11U	A	004	13A9	1211	1126 1146
R11V	A	003	12E2	1120	1117* 1118*
R2	A	001	2957	3227	
SAVRSA	A	005	1FD3	2651	2646
SAVRSB	A	004	1FDE	2655	2649
SAVRSC	A	004	1FE2	2657	2652
SAVRST	A	004	1FB5	2639	0917 0924 2015 2022 2051 2353 2364
SAVRSX	A	004	1FF6	2662	2639* 2643
SBYTE0	C	001	0208	3433	
SBYTE1	C	001	0209	3434	
SBYTE2	C	001	020A	3435	0905 1257 1272
SBYTE3	C	001	020B	3436	0904 1077* 1211* 1256 1271
SBYTE4	C	001	020C	3437	1266 1281
SBYTE5	C	001	020D	3438	1252 1371 2694
SBO	A	002	2891	3128	
SCANE	A	004	19B9	1909	0569 0674
SCANH	A	004	19CD	1921	0577 0603 0755
SCANHA	A	004	19DD	1928	1916 1951 1963
SCANHX	A	004	19FD	1939	1909* 1921* 1928 1937* 1944* 1956*
SCN	A	002	2883	3121	3460
SCNRE	A	004	1A01	1944	0585 0697
SCNRH	A	004	1A15	1956	0593 0615 0770
SEEK	A	004	15BB	1466	0093 0128 0163 0207 0274 0349 0385 0457 0557 0655 0742 0811 0864 0877 1027
SEEKA	A	004	168D	1534	1461 1530
SEEKX	A	004	16A9	1544	1449* 1510*
SIO	A	003	1AFB	2052	1985* 1986* 2445 2645
SIOSNS	A	003	1D8E	2365	2348* 2349*
SKEND	C	001	0002	3396	1374 2047 2063 2068 2088 2177 2598 2602
SKMSK	A	001	293D	3195	2596
SKMSK2	A	001	2953	3222	
SKRST	A	001	293F	3197	2601
SKRST2	A	001	2955	3224	
SK00	A	006	15DA	1476	1479
SK00A	A	006	15ED	1481	1477 1484
SK00B	A	005	1600	1486	1482
SK01	A	003	161A	1498	1491
SK02	A	005	1625	1503	1505
SK03	A	006	1645	1513	1517
SK04	A	003	165B	1519	1514
SK05	A	006	1667	1524	1527
SK06	A	006	167A	1529	1525 1532

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SNS	A	002	2928	3171	0610 0622 0681 0704 0762 0777 1308* 1377* 1407 1410 2138* 2140 2192* 2194 2211 2333 2336* 2338 2345 2400 2401 2450 2584* 2586 2592 2597 2609 2610 2795* 2796
SNSAVL	C	001	0001	3397	1374 2240 2381 2522
SNSLP	A	004	20F3	2795	2799
SNS23	A	002	287D	3116	2236
SSWSV	A	004	28EB	3145	1252* 1371
SSW05	C	001	0004	3363	
SSW1A	C	001	0020	3371	1271
SSW1B	C	001	0010	3372	0904 1256
SSW11	C	001	0040	3368	0905 1257
SSW12	C	001	0020	3369	1272
SSW2F	C	001	0001	3377	2694
SSW21	C	001	0040	3374	1266
SSW22	C	001	0020	3375	1281
SVPFC	A	025	0A39	0035	2700* 2754*
SVPREQ	A	002	285E	3098	1032 1036 1243 2806
SVPSEQ	A	001	284D	3089	1310 1379 2780
SW	C	001	0001	3411	
SWS	A	002	28E7	3142	1398* 2004* 2100* 3143
SYSRST	A	004	2087	2774	1408
TAG13	A	001	2936	3179	1133* 1179
TAG23	A	001	2938	3181	1132* 1174
TAG43	A	001	2937	3180	1131* 1169
TAG83	A	001	2939	3182	1130* 1135 1164
TEST	C	001	0212	3440	1353
TIM3S	A	003	284C	3084	0931 2074 2371
TIO	A	004	1A96	2013	
TIOBSY	A	004	1B11	2061	1989* 1990* 2058 2071
TIOERR	C	001	0008	3394	
TIORDY	A	004	1AF3	2049	1988* 2039 2044 2341
UCKMSK	A	001	293E	3196	2344 2608
UCKMS2	A	001	2954	3223	
UDT0	A	003	0A0C	0023	
UDT1	A	003	0A0F	0024	
UNPACK	C	001	021E	3443	1157 1162 1167 1172 1177 2443 2448 2455 2460 2465 2479 2484 2489 2502 2507 2537 2542 2547 2552 2557 2562
UTAB	C	001	0232	3447	0985
WCPTN	A	004	2839	3070	0228 0231 0304 0307 0408 0411 0471 0547 0665 0666 0707 0732 0780 1056 3079
WCPTN@	A	002	2845	3079	0485
WORK	A	001	2929	3173	1471* 1476* 1481* 1486* 1488* 1493* 1503* 1504* 1507 1507* 1513 1516* 1520 1522* 1524* 1529*
WORKN	A	004	292C	3174	0469* 0473* 0496* 0519* 0931* 0933* 0937* 0939* 0941* 0946 0953* 0956* 0958 0961 1054* 1058* 1135* 1141* 1142* 1143* 1148 1225* 1226 1466* 1467 1579* 1581 1609* 1611 1691* 1692 1764* 1766 2074* 2076* 2083* 2175* 2179* 2211* 2235 2357* 2358 2371* 2373* 2377* 2378 2406* 2407 2658* 2683 2787* 2788 2793* 2798*
WRCCD	A	004	194A	1854	
WRCKD	A	004	1906	1825	0290 0396 0464 0825 1042 1063
WRCKDA	A	004	1916	1832	1861
WRCKDX	A	004	1946	1849	1825* 1832 1847* 1854*
WRHAE	A	004	18A7	1777	1033
WRHAO	A	004	18BA	1789	0355 1037
WRHAOA	A	005	18CA	1796	1784
WRKD	A	004	19A5	1897	0478
WRREP	A	004	195E	1866	0829
WRREPX	A	004	19A1	1892	1866* 1873 1890*
WRROO	A	004	18DB	1805	0391 0820 1049
WRROOA	A	004	18EB	1812	1800
WRROOX	A	004	1902	1820	1777* 1789* 1805*
XEQ	A	004	1A3D	1983	1534 1570 1599 1631 1654 1674 1715 1741 1755 1812 1836 1877 1932
XEQX	A	004	1B89	2104	1983*
XEQ01	A	004	1B1F	2068	2061
XEQ02	A	006	1B30	2074	2066 2069

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
XEQ03	A	006	184C	2083	2089
XEQ04	A	006	1B36	2076	2078
XR1	C	001	0001	3352	0226* 0228 0232 0237 0237* 0302* 0304 0308 0313 0313* 0406* 0408 0412 0417 0417* 0468* 0471 0472 0472* 0854* 0855 0870* 0872 0951* 0952* 0953 0955* 0956 1053* 1056 1057 1057* 1128* 1137 1138 1139 1145 1148 1151 1151* 1155 1226* 1228 1229 1231 1231* 1232 1254* 1261 1262 1262* 1276 1277 1277* 1286 1288* 1289 1290 1292 1337* 1339 1342 1344 1344* 1345 1349* 1350 1351 1467* 1471 1486 1495 1503 1509 1509* 1510 1512* 1515 1515* 1519 1522 1575* 1576 1578 1578* 1579 1606* 1607* 1608* 1609 1628* 1629 1651* 1652 1670* 1671 1672 1685* 1686* 1687* 1691 1711* 1712 1713 1757* 1758 1762* 1763 1763* 1764 1832* 1833 1834 1873* 1874 1875 1928* 1929 1930 1970* 1971* 1994* 1995 2094* 2095 2422* 2423 2640 2643* 2645 2648 2648* 2651 2654 2654* 2655 2661* 2674* 2697 2726* 2739 2762* 2775 2780* 2787 2789 2789* 2790 2801* 2802* 2810* 2823 2825* 2836 2841 2848 2848* 2850 2853*
XR2	C	001	0002	3353	0039 0223 0278 0299 0343 0332 0403 0454 0815 1039 1061 1117 1260* 1261 1264 1269 1275* 1276 1279 1284 1290* 1306 1342* 1351* 1387 1388 1405 1453 1454 1456 1490 1498 1499 1501 1519 1520 1542 1542 1553 1554 1565 1566 1568 1572 1576 1593 1594 1596 1597 1601 1604 1607 1608 1623 1624 1626 1629 1633 1646 1647 1649 1652 1667 1668 1671 1672 1676 1676 1680 1683 1686 1687 1688 1706 1707 1709 1712 1713 1717 1717 1721 1738 1739 1752 1753 1760 1781 1782 1793 1794 1796 1797 1797 1798 1809 1810 1814 1829 1830 1833 1834 1838 1838 1839 1841 1858 1859 1870 1871 1874 1875 1879 1879 1880 1882 1885 1901 1902 1913 1914 1925 1926 1929 1930 1948 1949 1960 1961 1985 1986 1988 1989 1992 1995 2038 2043 2344 2348 2391 2438 2582 2589* 2590 2590* 2596 2601 2608 2622* 2641 2673* 2698 2727* 2740 2763* 2776 2811*
Y	A	002	2871	3110	2841* 2842

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                           2 *
                           3         DECK  4
                           4         SEG   0
   0000                    5 STARTX  START 0
                           6         TREP
   0A00                    7         ORG   X'0A00'
                     0A00  8 EDIT    EQU   *
                     0A03  9 RNUM    EQU   *+3
                          10 ********************************************************************************
                          11 *             SECTION PREFACE                                                   *
                          12 *                                                                               *
   0A00 DD62         0A01 13         DC    XL2'DD62'
   0A02 00           0A02 14         DC    XL1'00'           SECTION FLAGS
   0A03 01           0A03 15 ONE     DC    XL1'01'           ROUTINE NO.
   0A04 0000         0A05 16         DC    XL2'00'           RESERVED
   0A06 0B99         0A07 17         DC    AL2(EDITA)        ADDRESS OF FIRST ROUTINE PREFIX
   0A08 0000         0A09 18         DC    AL2(*-*)          ADDRESS OF ERROR RECORDING TABLE
   0A0A C14000       0A0C 19         DC    XL3'C14000'
   0A0D E00000       0A0F 20 X5203   DC    XL3'E00000'
   0A10 E11000       0A12 21 X1403   DC    XL3'E11000'
                          22 *                                                                               *
                          23 ********************************************************************************
                          24
                          25
   0A13              0A14 26 STATE   DS    XL2
                     0A15 27 SAVIDB  EQU   *
                     0A15 28 PRTBF   EQU   SAVIDB
   0A15              0A74 29 SAVID   DS    XL96
                          30         ORG   X'0A80'
   0A80              0A80 31 READIN  EQU   *
   0B04                   32         ORG   READIN+132
                          33
   0B04 404040404040 0B09 34 BLNK    DC    CL6'      '
                     0B09 35 DGS2B   EQU   *-1
   0B0A              0B5F 36 DGSNS2  DS    XL86
                     0B60 37 DGSNSB  EQU   *
   0B60              0B77 38 DGSNS1  DS    XL24
                          39 *
                          40 *             SUBROUTINE TO SET DISK DATA FIELD TO X'00'
                          41 *
   0B78 34 08 0B89        42 SETTO   ST    SETTOR+3,ARR      SAVE RETURN ADDRESS
   0B7C 3C 00 48FF        43         MVI   DDDF+255,0        ZERO OUT DDDF FIELD
   0B80 0C FE 48FE 48FF   44         MVC   DDDF+254(255),DDDF+255
   0B86 C0 87 0000        45 SETTOR  B     *-*               RETURN TO CALLER
                          46
   0B8A 34 08 0B98        47 SETC    ST    SETOR+3,ARR       STORE RETURN ADDRESS
   0B8E 7C 00 FF          48         MVI   255(,XR1),0       ZERO OUT DDDF
   0B91 5C FE FE FF       49         MVC   254(255,XR1),255(,XR1)
   0B95 C0 87 0000        50 SETOR   B     *-*               RETURN TO CALLER
                          51
                          51
                          51
                          51
                          52 *             ROUTINE PREFACE
                          53
   0B99 01           0B99 54 EDITA   DC    XL1'01'           ROUTINE NUMBER
   0B9A 00           0B9A 55         DC    XL1'00'           ROUTINE FLAGS
   0B9B FFFF         0B9C 56 MINUS1  DC    XL2'FFFF'         ADDRESS OF NEXT ROUTINE
                          57
                          58 ********************************************************************************
                          59 *                                                                               *
                          60 *      OPERATING INSTRUCTIONS                                                   *
                          61 *                                                                               *
                          62 *      AT THE FIRST HALT, SET THE FOLLOWING SWITCHES,                           *
                          63 *                                                                               *
                          64 *      1. SET NO SWITCHES TO RUN ON DRIVE 1.                                    *
                          65 *      2. SET SWITCH 22 TO RUN ON DRIVE 2.                                      *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                          66 *      3. SET SWITCH 17 TO USE 3741 AS INPUT.                                 *
                          67 *      4. SET SWITCH 18 TO USE THE 1442 AS INPUT.                             *
                          68 *      5. SET SWITCH 1A TO USE THE MFCU AS INPUT.                             *
                          69 *      6. 5471 IS THE INPUT DEVICE IF SSW 17, 18, OR 1A IS NOT ON             *
                          70 *                                                                             *
                          71 ********************************************************************************
                          72
                          72
                          72
                          73 ********************************************************************************
                          74 *                                                                               *
                          75 *      S E L E C T     DISK  DRIVE,     AND INPUT DEVICE                        *
                          76 *                                                                               *
                          77 *                        ETC.                                                   *
                          78 ********************************************************************************
                     0B9D 79 SETDSK EQU   *
   0B9D 38 80 0233        80         TBN   UTAB+1,X'80'      IF NOT RUNNING FROM DISK, SET
   0BA1 F2 10 08          81         JT    *+11              SVPREQ LATCH (ALLOWS USAGE OF 12
   0BA4 31 C5 2B11        82         LIO   XREG,X'C5'        MBYTE DATA MODULE)
   0BA8 31 C5 2B13        83         LIO   SVPREQ,X'C5'
   0BAC 38 01 020D        84         TBN   SWITCH+3,SSW2F      IF SSW 2F IS ON, WE HAVE BEEN
   0BB0 F2 10 18          85         JT    EDITAA                CALLED BY 'FE7' (MLTA
                          86 *                                       CONFIGURATOR PROGRAM.)
   0BB3 C0 87 021A        87         B     PRINT             PRINT 'SELECT SSW OPTIONS'
   0BB7 42           0BB7 88         DC    XL1'42'           FLAGS
   0BB8 59           0BB8 89         DC    AL1(STRTMS-STRTMB) LENGTH
   0BB9 309F         0BBA 90         DC    AL2(STRTMS)       MESSAGE ADDRESS
   0BBB FFF0         0BBC 91         DC    XL2'FFF0'
   0BBD C0 87 021A        92         B     PRINT             PRINT  'SELECT INPUT DEVICE'
   0BC1 06           0BC1 93         DC    XL1'06'           FLAGS
   0BC2 43           0BC2 94         DC    AL1(STRTA-STRTAB) LENGTH
   0BC3 30E2         0BC4 95         DC    AL2(STRTA)        MESSAGE ADDRESS
   0BC5 C0 87 0222        96         B     HALT              TO OCP HALT
   0BC9 FFF0         0BCA 97         DC    XL2'FFF0'         HALT ID
                          98
                          98
   0BCB C0 87 0212        99 EDITAA  B     TEST              GO READ CONSOLE SWITCHES
   0BCF C0 87 234F       100         B     SELDRV            TO SEL DISK DRIVE RTN
   0BD3 38 FF 2AAD       101         SBF   ADDFLG,X'FF'      TURN OFF ADD MODE SWITCH
   0BD7 38 FF 2AA2       102         SBF   F3741,X'FF'       TURN OFF 3741 FLAGS
   0BDB C2 01 4800       103         LA    DDDF,XR1
   0BDF 38 10 0208       104         TBN   SWITCH+1,SSW1B     SSW1B IS ON, GO TO $ADD
   0BE3 C0 10 0D23       105         BT    GET2
                         106
                         106
   0BE7 38 01 020D       107         TBN   SWITCH+3,SSW2F    IF SSW 2F IS ON, GET RECORD FROM FE7
   0BEB F2 90 04         108         JF    AA07                OTHERWISE, GO ON AS USUAL
   0BEE 3C 07 2A48       109         MVI   NODS+1,X'07'        DON'T DO ANY PRINTING ON 5471
                         110
   0BF2 C0 87 2A2F       111 AA07    B     PRINT1          GO DISPLAY MESSGAGE
   0BF6 01           0BF6 112         DC    XL1'01'
   0BF7 26           0BF7 113         DC    AL1(MENU1-MENU1A)
   0BF8 31D9         0BF9 114         DC    AL2(MENU1)        MSG.  SELECT OPTION (CONTROL CARD)
   0BFA C0 87 2A2F       115         B     PRINT1            PRINT
   0BFE 01           0BFE 116         DC    XL1'01'           FLAG
   0BFF 28           0BFF 117         DC    AL1(MENU11-MENU1B) MESSAGE LENGTH
   0C00 3201         0C01 118         DC    AL2(MENU11)       MESSAGE ADDRESS
   0C02 C0 87 2A2F       119         B     PRINT1            PRINT
   0C06 01           0C06 120         DC    XL1'01'           FLAG
   0C07 28           0C07 121         DC    AL1(MENU12-MENU1C) MESSAGE LENGTH
   0C08 3229         0C09 122         DC    AL2(MENU12)       MESSAGE ADDRESS
   0C0A C0 87 2A2F       123         B     PRINT1            PRINT
   0C0E 01           0C0E 124         DC    XL1'01'           FLAG
   0C0F 28           0C0F 125         DC    AL1(MENU13-MENU1D) MESSAGE LENGTH
   0C10 3251         0C11 126         DC    AL2(MENU13)       MESSAGE ADDRESS
   0C12 C0 87 2A2F       127         B     PRINT1            PRINT
   0C16 01           0C16 128         DC    XL1'01'           FLAG
   0C17 28           0C17 129         DC    AL1(MENU14-MENU1E) MESSAGE LENGTH
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         0C19  130        DC    AL2(MENU14)         MESSAGE ADDRESS
 0C18 3279               0C19  131        B     PRINT1              PRINT
 0C1A C0 87 2A2F         0C1E  132        DC    XL1'01'             FLAG
 0C1E 01                 0C1F  133        DC    AL1(MENU15-MENU1F)  MESSAGE LENGTH
 0C1F 28                 0C21  134        DC    AL2(MENU15)         MESSAGE ADDRESS
 0C20 32A1                     135        B     PRINT1              PRINT
 0C22 C0 87 2A2F         0C26  136        DC    XL1'01'             FLAG
 0C26 01                 0C27  137        DC    AL1(MENU16-MENU1G)  MESSAGE LENGTH
 0C27 28                 0C29  138        DC    AL2(MENU16)         MESSAGE ADDRESS
 0C28 32C9                     139        B     PRINT1              PRINT
 0C2A C0 87 2A2F         0C2E  140        DC    XL1'01'             FLAG
 0C2E 01                 0C2F  141        DC    AL1(MENU17-MENU1H)  MESSAGE LENGTH
 0C2F 28                 0C31  142        DC    AL2(MENU17)         MESSAGE ADDRESS
 0C30 32F1                     143        B     PRINT1              PRINT
 0C32 C0 87 2A2F         0C36  144        DC    XL1'02'             FLAG
 0C36 02                 0C37  145        DC    AL1(MENU18-MENU1I)  MESSAGE LENGTH
 0C37 28                 0C39  146        DC    AL2(MENU18)         MESSAGE ADDRESS
 0C38 3319                     147        B     PRINT1              PRINT MSG
 0C3A C0 87 2A2F         0C3E  148        DC    XL1'06'             FLAG
 0C3E 06                 0C3F  149        DC    AL1(KBRDY-KBRDYB)   LENGTH
 0C3F 14                 0C41  150        DC    AL2(KBRDY)          ADDRESS
 0C40 3029                     151 GET1   B     RECORD                    READ A RECORD
 0C42 C0 87 2749               152        CLC   95(96,XR2),96(,XR2)         CHECK FOR BLANK RECORD
 0C46 AD 5F 5F 60              153        BE    GET1                        IF BLANK THEN READ NEXT CARD
 0C4A C0 81 0C42
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         0C4E  155 ********************************************************************************
                         0C4E  156 *                                                                              *
                         0C4E  157 *     CHECK FOR        $    /*      /&     OR    C                          *
                         0C4E  158 *                                                                              *
                         0C4E  159 *                                                                              *
                         0C4E  160 *                                                                              *
                         0C4E  161 ********************************************************************************
                         0C4E  162
 0C4E BD 5B 00           0C4E  163 RTRN   CLI   0(,XR2),C'$'        DOES COLUMN 1 CONTAIN A $?
 0C51 F2 81 51           0C51  164        JE    ADDTST              BRANCH IF YES
 0C54 BD 61 00           0C54  165        CLI   0(,XR2),C'/'        DOES COLUMN 1 CONTAIN A SLASH?
 0C57 F2 01 0D           0C57  166        JNE   FLAGS               JUMP IF NO
 0C5A BD 50 01           0C5A  167        CLI   1(,XR2),C'&'        DOES COLUMN 2 CONTAIN A & ?
 0C5D C0 81 0C8F         0C5D  168        BE    LINKM               IF YES EXIT PROGRAM
 0C61 BD 5C 01           0C61  169        CLI   1(,XR2),C'*'        DOES COLUMN 2 CONTAIN A * ?
 0C64 F2 81 34           0C64  170        JE    PAUSE               TO PROGRAM HALT IF YES
                         0C67  171 FLAGS  EQU   *
 0C67 C0 87 2A2F         0C67  172        B     PRINT1        GO DISPLAY MESSGAGE
 0C6B 06                 0C6B  173        DC    XL1'06'       FLAG
 0C6C 27                 0C6C  174        DC    AL1(MCTL-MCTLB)  LENGTH
 0C6D 35F7               0C6E  175        DC    AL2(MCTL)        MSG.  INVALID CONTROL CARD
 0C6F 3C F0 2AA3               176        MVI   FADD,C'0'        RESET 3741 FORCED ADD FLAG
 0C73 38 F0 27F5               177        TBN   USECRT,X'F0'     IS CRT IN USE, DON'T PRINT/HALT
 0C77 C0 10 0C42               178        BT    GET1             GO GET CONTROL CARD AGAIN
 0C7B C0 87 021A               179        B     PRINT                 NO, PRINT ERROR.
 0C7F 46                 0C7F  180        DC    XL1'46'               FLAGS
 0C80 14                 0C80  181        DC    IL1'20'               LENGTH
 0C81 3175               0C82  182        DC    AL2(ERR0)             ADDRESS OF LAST PRINT CHARACTER.
 0C83 FFE0               0C84  183        DC    XL2'FFE0'             MESSAGE IDENTIFICATION
 0C85 C0 87 0222               184        B     HALT                  TO DCP ERROR HALT
 0C89 FFE0               0C8A  185        DC    XL2'FFE0'             HALT ID
 0C8B C0 87 0BF2               186        B     AA07
                               187
 0C8F C0 87 2A2F         0C8F  188 LINKM  EQU   *
 0C93 06                       189        B     PRINT1        GO DISPLAY MESSGAGE
 0C94 12                 0C93  190        DC    XL1'06'       FLAG
 0C95 3046               0C94  191        DC    AL1(TERM-TERMB)
 0C97 C0 87 0216         0C96  192        DC    AL2(TERM)     MSG.  OPERATION TERMINATED
                               193        B     LINK          TERMINATE
 0C9B C0 87 0222               194
 0C9F FFE1                     195 PAUSE  B     HALT                TO DCP ERROR HALT
 0CA1 C0 87 0BCB         0CA0  196        DC    XL2'FFE1'           HALT ID
                               197        B     EDITAA              RESTART PROGRAM
                               198
                         0CA5  199 ADDTST EQU   *
 0CA5 BD C1 01                 200        CLI   1(,XR2),C'A'
 0CA8 F2 81 68                 201        JE    SETADD
 0CAB BD D9 01                 202        CLI   1(,XR2),C'R'        R IN COL. 1 ?
 0CAE F2 01 07                 203        JNE   TFI
 0CB1 BD 40 04                 204        CLI   4(,XR2),C' '        MAKE SURE COLUMN 5 NOT BLANK
 0CB4 C0 01 1614               205        BNE   REPPGM
 0CB8 8D 01 02 2B03            206 TFI    CLC   2(2,XR2),FIGCON     DO COLUMNS 2-7 = CONFIG?
 0CBD C0 81 1D97               207        BE    CFGPGM              IF YES, GO TO CONFIGURE ROUTINE
 0CC1 8D 01 02 2BF6            208        CLC   2(2,XR2),DEL        DO COLUMNS 2-3 ='DE'
 0CC6 F2 01 07                 209        JNE   TL                        IF YES, CONTINUE
 0CC9 BD 40 04                 210        CLI   4(,XR2),C' '           MAKE SURE COL. 5 NOT BLANK
 0CCC C0 01 160B               211        BNE   DELPGM
 0CD0 BD D3 01                 212 TL     CLI   1(,XR2),C'L'
 0CD3 C0 81 1B4F               213        BE    LSTPGM                IF YES DO A LIST.
 0CD7 8D 01 02 2B05            214        CLC   2(2,XR2),CMPCON       IS IT COMPRESS?
 0CDC C0 81 1C69               215        BE    CMPPGM
 0CE0 8D 01 02 2BF8            216        CLC   2(2,XR2),DU
 0CE5 F2 01 07                 217        JNE   DE
 0CE8 BD 40 04                 218        CLI   4(,XR2),C' '        MAKE SURE COL 5 IS BLANK
 0CEB C0 81 1877               219        BE    DSKDUP
 0CEF C0 87 2A2F         0CF3  220 DE     B     PRINT1        GO DISPLAY MESSGAGE
 0CF3 06                 0CF3  221        DC    XL1'06'       FLAG
 0CF4 27                 0CF4  222        DC    AL1(MCTL-MCTLB)  LENGTH
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0CF5 35F7             0CF6  223        DC    AL2(MCTL)         MSG.  INVALID CONTROL CARD
   0CF7 38 F0 27F5             224        TBN   USECRT,X'F0'      IS 5471 IN USE,DON'T PRINT/HALT
   0CFB C0 10 0C42             225        BT    GET1              GO GET CONTROL CARD AGAIN
   0CFF C0 87 021A             226        B     PRINT                   NONE OF THE ABOVE, GO PRINT ERROR.
   0D03 C6               0D03  227        DC    XL1'C6'                 FLAGS
   0D04 15               0D04  228        DC    IL1'21'                 LENGTH
   0D05 317E             0D06  229        DC    AL2(ERR2)               ADDRESS OF LAST PRINT CHARACTER.
   0D07 FFE2             0D08  230        DC    XL2'FFE2'               MESSAGE IDENTIFICATION
   0D09 C0 87 0222             231        E     HALT                    TO DCP ERROR HALT
   0D0D FFE2             0D0E  232        DC    XL2'FFE2'               HALT ID
   0D0F C0 87 0BF2             233        B     AA07
                               234
                               235 ********************************************************************************
                               236 ********************************************************************************
                               237 **                                                                            **
                               238 **      $ADD                                                                  **
                               239 **                                                                            **
                               240 **      ADD PROGRAM DECK OR DECKS TO CE DATA MODULE                           **
                               241 **                                                                            **
                               242 ********************************************************************************
                               243 ********************************************************************************
                               244
                               244
                               244
   0D13 C0 87 2A2F             245 SETADD B     PRINT1            GO DISPLAY MESSGAGE
   0D17 06               0D17  246        DC    XL1'06'
   0D18 26               0D18  247        DC    AL1(MADD-MADDB)
   0D19 361D             0D1A  248        DC    AL2(MADD)         MSG.  ADD ILLEGAL IF ON 5471
   0D1B 38 F0 27F5             249        TBN   USECRT,X'F0'      IF USING 5471,RETURN TO START
   0D1F C0 10 0C42             250        BT    GET1
                               251
                               251
                               252 ********************************************************************************
                               253 *                                                                              *
                               254 *      CHECK FOR HEADER CARD AND TYPE OF DECK                                  *
                               255 ********************************************************************************
                               256
                               256
   0D23 C0 87 2749             257 GET2  B     RECORD            READ 1ST RECORD
   0D27 AD 5F 5F 60            258        CLC   95(96,XR2),96(,XR2)       CHECK FOR BLANK CARD
   0D2B C0 81 0D23             259        BE    GET2              READ ANOTHER CARD IF BLANK
                               260
                         0D2F  261 RTRN2 EQU   *
   0D2F 3A 0F 2AAD             262        SBN   ADDFLG,X'0F'      TURN ON ADD MODE SWITCH
   0D33 0F 06 2AA0 2AA0        263        SLC   DCPFG(7),DCPFG    ZER OUT DCPFG,DFLAG,NWRTFG,NWRT,PFLAG
   0D39 0C 06 30F0 313F        264        MVC   ADMSG+6(7),ADDED  PREPARE PRINT FIELD TO PRINT
   0D3F 2C 14 3110 1F          265        MVC   ADMSG+38(21),31(,XR2)  PROGRAM ADDED AT END OF ROUTINE
   0D44 2C 1F 3138 3F          266        MVC   ADMSG+78(32),63(,XR2)
                               267
   0D49 38 0F 2AAA             268        TBN   CPUFG,X'0F'       IF CPU MODULE JUST READ, THEN CHECK
   0D4D C0 10 121D             269        BT    CPUPG             IF THIS IS CPU MODULE
                               270
   0D51 04 30 2B0B 2AD4        271        ZAZ   SEQCTR(4),D0(1)   INITIALIZE SEQUENCE COUNTER
                               272
   0D57 8D 01 0C 2AE6          273        CLC   12(2,XR2),PN      IS IT A HEADER CARD?
   0D5C C0 01 1454             274        BNE   TSTDCP            TO ERROR RTN
   0D60 3C F0 2AA3             275        MVI   FADD,C'0'         RESET 3741 FORCED ADD FLAG
   0D64 8D 03 5F 2AD4          276        CLC   95(4,XR2),D0      IS HEADER CARD SEQ #=0?
   0D69 C0 01 1541             277        BNE   INVSEQ           PRINT ERROR IF NOT
   0D6D BD D4 00               278        CLI   0(,XR2),C'M'      IS IT A TAP DECK?
   0D70 F2 01 07               279        JNE   *+10              SKIP IF NOT
   0D73 3C F0 2A9F             280        MVI   DFLAG,X'F0'       SET FLAG FOR TAP DECK
   0D77 F2 87 30               281        J     CONTE6            DON'T CHECK FOR SYSTEM TEST
   0D7A 8D 05 50 0B09          282        CLC   80(6,XR2),BLNK    ARE COL'S 75-81 BLANK/
   0D7F F2 81 28               283        JE    CONTE6            IF SO SKIP OUT OF ROUTINE
   0D82 BD 40 4A               284        CLI   74(,XR2),C' '     IS COLUMN 75 BLANK?
   0D85 C0 01 150D             285        BNE   INVSCD            BRANCH TO INVALID SYS TEST HDR
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0D89 0C 00 0D97 2B78        286        MVC   CLI2+2(1),X74     INITIALIZE COMPARE INSTRUCTION
                               287
   0D8F 0E 00 0D97 0A03        288 LOOP7  ALC   CLI2+2(1),ONE     INCREMENT POINTER
   0D95 BD 40 00               289 CLI2   CLI   *-*(,XR2),C' '     IS FIELD BLANK
   0D98 C0 81 150D             290        BE    INVSCD            TO INVALID SYS TST HDR
   0D9C 0D 00 0D97 27EE        291        CLC   CLI2+2(1),X80     IS COUNTER =80
   0DA2 C0 01 0D8F             292        BNE   LOOP7
   0DA6 3C 0F 2A9D             293        MVI   SCDFG,X'0F'       SET SYSTEM TEST MODULE FLAG
                               294
                         0DAA  295 CONTE6 EQU   *
   0DAA 2C 5F 0A74 5F          296        MVC   SAVID(96),95(,XR2)  SAVE INFO FOR VTOC
   0DAF 2C 03 2ACA 5B          297        MVC   SAVEID(4),91(,XR2)  SAVE ID FOR LATER COMPARE
   0DB4 8D 02 5A 2B16          298        CLC   90(3,XR2),FFA       IS IT LOADER?
   0DB9 C0 81 116B             299        BE    ADDFFA              TO LOADER SEEK RTN
   0DBD 8D 02 5A 2B19          300        CLC   90(3,XR2),FFB       IS IT LOADER?
   0DC2 F2 01 0D               301        JNE   CONTE1              TO LOADER SEEK RTN
   0DC5 3C FF 2A9B             302        MVI   NWRTFG,X'FF'        DON'T WRITE IN VTOC
   0DC9 0C 04 2BAB 2825        303        MVC   DDCFM(5),C3H172     SET CONTROL FIELD
   0DCF F2 87 35               304        J     CONTB2
   0DD2 8D 03 03 2B20          305 CONTE1 CLC   3(4,XR2),DTAHDR     IS IT DATA DECK?
   0DD7 F2 01 13               306        JNE   CKM
   0DDA 2C 03 2ADA 56          307        MVC   LSTDCD(4),86(,XR2)  SAVE # OF LAST DATA CARD
   0DDF 3C 0F 2A9F             308        MVI   DFLAG,X'0F'
   0DE3 BD D7 52               309        CLI   82(,XR2),C'P'       IS IT PROG DATA DECK?
   0DE6 F2 01 04               310        JNE   CKM                   NO, DON'T SET FLAG
   0DE9 3C 0F 2A9A             311        MVI   PFLAG,X'0F'         SET PROG DATA DECK FLAG
                               312
   0DED C0 87 121D             313 CKM    B     CPUPG               CHECK IF CPU MODULE
                         0DF1  314 DCPCT1 EQU   *
   0DF1 C0 87 2201             315        B     RDFAS               READ FAS SECTOR
                               316
   0DF5 0C 01 2AB0 2272        317        MVC   VTOC#(2),FASINF     STORE # OF RECORDS IN VTOC
   0DFB 0C 04 2BA5 226F        318        MVC   NAS(5),FASINB+8     STORE NEXT AVAIL SECTOR
   0E01 0C 04 2BAB 2BA5        319        MVC   DDCFM(5),NAS        SET DDCF FOR SEEK
                               320
                               320
                               321 ********************************************************************************
                               322 *      THIS SECTION READS 48 CARDS AT A TIME, CHECKS THEM, AND                 *
                               323 *      BRANCHES TO A WRITE ROUTINE.                                            *
                               324 *                                                                              *
                               325 ********************************************************************************
                               326
                               326
                         0E07  327 CONTB2 EQU   *
   0E07 3C 00 2B9A             328        MVI   VTIM-5,0            ZERO SYSTEM TEST FLAG
   0E0B 0C 01 2B98 2B47        329        MVC   SCTR(2),ZERO        ZERO SECTOR LENGTH FIELD
   0E11 06 30 2B0B 2ADB        330        AZ    SEQCTR(4),D1(1)     INITIALIZE SEQ CTR
   0E17 3C 01 2B0D             331        MVI   RCTR,1              INITIALIZE RECORD COUNTER
                               332
   0E1B 6C 5F DF 5F            333        MVC   223(96,XR1),95(,XR2)
   0E1F 6C 5F 5F 5F            334        MVC   95(96,XR1),95(,XR2) MOVE 2ND DDDF FIELD IN
   0E23 36 01 2B77             335        A     X256,XR1            INCREMENT POINTER TO NEXT FIELD
   0E27 F2 87 08               336        J     LOOP1
                               337
   0E2A C2 01 4800             338 LOOP2  LA    DDDF,XR1            INITIALIZE XR1
   0E2E 3C 00 2B0D             339        MVI   RCTR,0              INITIALIZE RECORD COUNTER TO -1
                               340
   0E32 C0 87 2749             341 LOOP1  B     RECORD              READ A CARD RECORD
                               342
   0E36 AD 5F 5F 60            343        CLC   95(96,XR2),96(,XR2) IS IT A BLANK CARD?
   0E3A C0 81 0E32             344        BE    LOOP1               IF SO, FLUSH IT
                               345
   0E3E 3D 00 2A9F             346        CLI   DFLAG,0             IS IT DATA DECK OR TAP DECK?
   0E42 F2 01 6E               347        JNE   CONTA?              IF IT IS, DONT CHECK TEXT CARD
                               348
   0E45 BD E2 00               349        CLI   0(,XR2),C'S'        IS IT AN 'S' CARD?
   0E48 F2 01 0A               350        JNE   *+13                IF NOT, SKIP THIS SECTION
   0E4B 06 30 2B0B 2ADB        351        AZ    SEQCTR(4),D1(1)     INCREMENT SEQ # COUNTER
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   0E51 C0 87 0E32            352         B     LOOP1          READ ANOTHER CARD
                              353
   0E55 BD D9 00              354         CLI   0(,XR2),C'R'   IS IT A REP CARD?
   0E58 F2 01 15              355         JNE   CONTE2         IF SO, CONVERT IT TO A TEXT RCRD
   0E5B BD 40 01              356         CLI   1(,XR2),C' '   IF COLUMN 2 OR 7 ARE NOT BLANK
   0E5E C0 01 1153            357         BNE   REPERR            THE CARD IS IN ERROR
   0E62 BD 40 06              358         CLI   6(,XR2),C' '
   0E65 C0 01 1153            359         BNE   REPERR
   0E69 C0 87 202E            360         B     CONVRT         CONVRT TEXT CARD
   0E6D F2 87 A9              361         J     LOOP4
                              362
   0E70 BD 5C 00              363 CONTE2  CLI   0(,XR2),C'*'    IS IT A COMMENT CARD?
   0E73 C0 81 12F1            364         BE    ASTRK          GO  HANDLE IT
   0E77 8D 03 03 2AFA         365         CLC   3(4,XR2),SSWID IS IT A SSW CARD?
   0E7C F2 01 0B              366         JNE   NOTSSW         JUMP IF NOT
   0E7F 38 FF 2AA0            367         TBN   DCPFG,X'FF'    IF IT IS DCP THEN GO ADD IT IN ITS
   0E83 C0 10 1319            368         BT    DCPCD1         SPECIAL RECORD.
   0E87 F2 87 8F              369         J     LOOP4          CTHERWISE ADD IT NORMALLY
   0E8A 8D 03 03 2AFE         370 NOTSSW  CLC   3(4,XR2),UDTID IS IT A UDT CARD?
   0E8F C0 81 13F5            371         BE    DCPCD3         GO HANDLE IT
   0E93 8D 03 03 2AEE         372         CLC   3(4,XR2),CPUIDZ IS IT A CPU CARD?
   0E98 C0 81 141D            373         BE    DCPCD4         GO HANDLE IT
   0E9C 8D 07 07 2AF6         374         CLC   7(8,XR2),CHNID IS IT A // CHAIN CARD
   0EA1 C0 81 1383            375         BE    DCPCD2         GO HANDLE IT
                              376
   0EA5 BD C5 00              377         CLI   0(,XR2),C'E'   IS IT AN END CARD?
   0EA8 C0 81 0F33            378         BE    LWRITE         GO TO LAST WRITE ROUTINE
                              379
   0EAC BD E3 00              380         CLI   0(,XR2),C'T'   IS IT A TEXT CARD?
   0EAF C0 01 1521            381         BNE   INVCD          SINCE THAT IS THE ONLY THING LEFT,
                              382 *                         IF IT ISN'T A TEXT CARD IT IS INVALID
   0EB3 3D F0 2A9F            383 CONTA7  CLI   DFLAG,X'F0'    IS IT A TAP  DECK?
   0EB7 F2 01 09              384         JNE   **+12          SKIP IF NOT
   0EBA 8D 01 01 2AE8         385         CLC   1(2,XR2),ME    IS AT A TAP END CARD?
   0EBF C0 81 0F33            386         BE    LWRITE         WRITE FOR THE LAST TIME
                              387
   0EC3 3D 0F 2A9F            388         CLI   DFLAG,X'0F'    IS IT A DATA DECK
   0EC7 F2 01 1D              389         JNE   SEQCHK         THEN SKIP THE SEQ # CHECK
   0ECA 2D 03 2ADA 5F         390         CLC   LSTDCD(4),95(,XR2) IS IT THE LAST CARD IN THE DATA DCK?
   0ECF C0 01 0EE7            391         BNE   SEQCHK         GO TO LAST WRITE ROUTINE
   0ED3 3D 0F 2A9A            392         CLI   PFLAG,X'0F'    IS IT PROG. DATA DECK?
   0ED7 C0 01 0F33            393         BNE   LWRITE           NO, GO TO LAST WRITE ROUTINE
   0EDB 3D 02 2AAC            394         CLI   CDIOR2,2       IS IT UNCOMPRESSED DECK?
   0EDF C0 01 0F33            395         BNE   LWRITE           NO, GO TO LAST WRITE ROUTINE
   0EE3 3A F0 2A9A            396         SBN   PFLAG,X'F0'    SET ON LAST PROG DATA CARD FLAG
                              397
   0EE7 8D 03 5F 2B0B         398 SEQCHK  CLC   95(4,XR2),SEQCTR  COMPARE SEQ #'S
   0EEC C0 01 1541            399         BNE   INVSEQ         IF NOT =, GO PRINT ERROR
   0EF0 8D 03 5B 2ACA         400         CLC   91(4,XR2),SAVEID IS ID SAME AS ON HEADER CARD?
   0EF5 C0 01 1572            401         BNE   INVID          IF NOT=, GO PRINT ERROR
                              402
   0EF9 06 30 2B0B 2ADB       403         AZ    SEQCTR(4),D1(1)  INCREMENT SEQUENCE COUNTER
                              404
   0EFF 3D 00 2A9F            405         CLI   DFLAG,0        IF NOT A DATA OR TAP DECK THEN
   0F03 F2 81 07              406         JE    NOTDAT           COMPRESS IT
   0F06 38 0F 2A9A            407         TBN   PFLAG,X'0F'    IF NOT A PROG DATA DECK THEN
   0F0A F2 90 0C              408         JF    LOOP4            SKIP COMPRESS
   0F0D C0 87 1F59            409 NOTDAT  B     CMPRS1         COMPRESS TEXT CARD
   0F11 3D FF 2A9A            410         CLI   PFLAG,X'FF'    PROG DATA DECK LAST CARD?
   0F15 C0 81 0F33            411         BE    LWRITE           YES, GO TO END CARD ROUTINE
                              412
   0F19 6C 5F 5F 5F           413 LOOP4   MVC   95(96,XR1),95(,XR2) MOVE CARD RECORD INTO DISK WRITE RCD
   0F1D 3D 2F 2B0D            414         CLI   RCTR,47        IS RCTR = MAXREC
   0F21 C0 81 0F44            415         BE    WRITE          IF SO,GO WRITE 48 RECORDS
   0F25 0E 00 2B0D 0A03       416         ALC   RCTR(1),ONE    INCREMENT COUNTER
   0F2B 36 01 2B77            417         A     X256,XR1       INCREMENT POINTER
   0F2F C0 87 0F32            418         B     LOOP1          READ ANOTHER RECORD
                              419
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                              420 ********************************************************************************
                              421 *      THIS SECTION WRITES DECKS ON THE DISK.                                  *
                              422 ********************************************************************************
                              423
                              423
   0F33 3C FF 2A9E            424 LWRITE  MVI   LWRT,X'FF'       SET LAST RECORD FLAG
   0F37 3B 01 2AA2            425         SBF   F3741,X'01'      RESET 3741 ADD FLAG
   0F3B 6C 5F 5F 5F           426         MVC   95(96,XR1),95(,XR2)  WRITE END CARD IMAGE ON PACK
   0F3F 4C 7F FF 3726         427         MVC   MSGBGN+LENGTH-ENDROU(LENGTH-ENDROU,XR1),LENGTH-1
                              428
                              429 *      THE ABOVE INSTRUCTION ADDS THE END CARD ROUTINE
                              430 *      INTO THE LAST HALF OF THE END CARD.
                              431
   0F44 0C 00 2BAF 2B0D       432 WRITE   MVC   DDCF(1),RCTR     SET # OF RECORDS TO WRITE
   0F4A C0 87 239C            433         B     WINRW            WRITE N RECORDS
   0F4E 40          0F4E      434         DC    XL1'40'          WRITE FLAG
   0F4F 4800        0F50      435         DC    AL2(DDDF)        @ OF DDDF
   0F51 2BA6        0F52      436         DC    AL2(DDCFB)       @ OF DDCF
                              437
   0F53 0E 01 2B98 2B0D       438         ALC   SCTR(2),RCTR     INCREMENT SECTOR COUNTER
   0F59 0E 01 2B98 0A03       439         ALC   SCTR(2),ONE      ADJUST TO CORRECT VALUE
                              440
   0F5F C0 87 2198            441         B     STPFLD           STEP DDCF TO NEXT SECTOR
   0F63 2BAB        0F64      442         DC    AL2(DDCFM)       @ OF RIGHT MOST BYTE
                              443
   0F65 3D FF 2A9E            444         CLI   LWRT,X'FF'       IS LAST WRITE FLAG SET?
   0F69 C0 01 0E2A            445         BNE   LOOP2            READ ANOTHER RECORD IF NOT
                              446
                              446
                              446
                              446
                              446
                              447 ********************************************************************************
                              448 *            SCAN VTOC AND OVERWRITE OLD PROGRAMS                              *
                              449 ********************************************************************************
                              450
                              450
   0F6D 3D FF 2A9B            451         CLI   NWRTFG,X'FF'     IS NO WRITE FLAG SET?
   0F71 C0 81 1020            452         BE    FASWR            THEN WRITE IT IN FAS AREA
                              453
   0F75 0C 04 2B91 2BA5       454 RTRN1   MVC   VTIMB+14(5),NAS  MOVE IN DISK LOCATION
   0F7B 0C 04 2BA5 2BAB       455         MVC   NAS(5),DDCFM     UPDATE NEXT AVAIL SECTOR
                              456
   0F81 C0 87 0B78            457         B     SETTO            SET DDDF FIELD TO 0
                              458
   0F85 0D 01 2AB0 2B47       459         CLC   VTOC#(2),ZERO    IS THIS FIRST ENTRY?
   0F8B C0 81 112B            460         BE    NWRT             GO TO NEW RTN WRITE
                              461
                              461
   0F8F 0C 02 0F9C 2AC9       462         MVC   PRGID2(3),SAVEID-1  MOVE IN PROGRAM ID
   0F95 C0 87 227A            463         B     SCNVTC           SCAN VTOC
   0F99 00          0F99      464 FLAG2   DC    IL1'0'           FLAG
   0F9A E7E7E7      0F9C      465 PRGID2  DC    CL3'XXX'         PROGRAM TO SCAN FOR
                              466
   0F9D 3D 00 0F99            467         CLI   FLAG2,0          IF THERE IS NOT A SCAN HIT, GO TO
   0FA1 F2 81 13                    468         JE    NRWRT            NRWRT
   0FA4 3C 00 2BAF            469         MVI   DDCF,0           SET TO 1 RECORD
   0FA8 0C 02 4806 2B01       470         MVC   DDDF+6(3),OLD    OVERWRITE WITH 'OLD'
   0FAE C0 87 239C            471         B     WINRW            WRITE ON  DISK
   0FB2 40          0FB2      472         DC    XL1'40'          WRITE FLAG
   0FB3 4800        0FB4      473         DC    AL2(DDDF)        @ OF DDDF
   0FB5 2BA6        0FB6      474         DC    AL2(DDCFB)       @ OF DDCF
                              475
   0FB7 C0 87 227A            476 NRWRT   B     SCNVTC           SCAN VTOC TO END
   0FBB 00          0FBB      477 FLAG3   DC    IL1'0'           FLAG
   0FBC 5C5C5C      0FBE      478         DC    CL3'***'         ADDRESS OF NO PROGRAMS  (SCAN TO
                              479 *                               THE END)
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0FBF 3D 00 0FBB             480         CLI   FLAG3,0               IS IT SCAN   HIT?
   0FC3 C0 81 15CD             481         BE    SCNERR                GO TO ERROR RTN
                               482
   0FC7 0C 02 2B89 0A6F        483         MVC   VTIMB+6(3),IDLOC      SET ID IN VTOC
   0FCD 0C 00 2B8B 0A70        484         MVC   VTIMB+8(1),IDLOC+1    SET LEVEL IN VTOC
   0FD3 3D 00 2A9D             485         CLI   SCOFG,0               SYS TEST MODULE?
   0FD7 F2 81 09               486         JE    CONTC5                JUMP IF NOT
                               487
   0FDA C0 87 0226             488         B     PACK                  TO DCP PACK RTN: SET SYS TEST FLAG
   0FDE 02           0FDE      489         DC    IL1'2'                LENGTH
   0FDF 0A6E         0FE0      490         DC    AL2(IDLOC-1)          SOURCE
   0FE1 2B9A         0FE2      491         DC    AL2(VTIM-5)           LENGTH
                               492
   0FE3 0C 1C 481C 2B9F        493 CONTC5  MVC   DDDF+28(29),VTIM       MOVE VTOC IMAGE
   0FE9 0C 5F 48DF 0A74        494         MVC   DDDF+223(96),SAVID      MOVE HEADER CARD IMAGE
                               495
   0FEF 3C 01 2BAF             496 WRTVTC  MVI   DDCF,1                  WRITE 2 RECORDS
   0FF3 3C 00 49FF             497         MVI   DDDF1+255,0             SET 2ND DDDF FIELD TO 0
   0FF7 0C FE 49FE 49FF        498         MVC   DDDF1+254(255),DDDF1+255
                               499
   0FFD C0 87 239C             500         B     WINRW                   WRITE 2 RECORDS ON DISK
   1001 40           1001      501         DC    XL1'40'                 WRITE FLAG
   1002 4800         1003      502         DC    AL2(DDDF)               @ OF DDDF
   1004 2BA6         1005      503         DC    AL2(DDCFB)              @ OF DDCF
                               504
   1006 0E 01 2AB0 0A03        505         ALC   VTOC#(2),ONE            INCREMENT # OF VTOC ENTRIES
   100C 0C 01 2272 2AB0        506         MVC   FASINF(2),VTOC#         MOVE IN # OF VTOC ENTRIES IN FAS
   1012 0C 04 226F 2BA5        507         MVC   FASINF-3(5),NAS         MOVE IN NEW NAS IN FAS
   1018 C0 87 2242             508         B     WRFAS
   101C C0 87 12AA             509         B     CONTC9                  PRINT A MESSAGE
                               510
                               510
                               511 ********************************************************************
                               512 *          RECORD SPECIAL MODULES IN VTOC FORMAT IN FAS             *
                               513 ********************************************************************
                               514
                               514
   1020 3D FF 2AA0             515 FASWR   CLI   DCPFG,X'FF'             IS IT DCP MODULE?
   1024 F2 81 2C               516         JE    QDCP
   1027 38 0F 2AAA             517         TBN   CPUFG,X'0F'             IS IT CPU DATA MODULE
   102B F2 10 70               518         JT    QCPU                    THEN GO HANDLE IT
   102E 0D 02 0A6F 2B16        519         CLC   IDLOC(3),FFA            IS IT FFA MODULE?
   1034 F2 81 BB               520         JE    QFFA
   1037 0D 02 0A6F 2B19        521         CLC   IDLOC(3),FFB            IS IT LOADER MODULE?
   103D F2 81 04               522         JE    QFFB
   1040 C0 87 0F75             523         B     RTRN1                   IF NONE OF THE ABOVE, RETURN
                               524
   1044 0C 04 2B91 2B25        525 QFFB    MVC   VTIMB+14(5),C3H172      SET UP VTOC IMAGE
   104A 0C 04 2BAB 2B34        526         MVC   DDCFM(5),C3H163
   1050 F2 87 AB               527         J     CONTC3
                               528
   1053 38 FF 2A9C             529 QDCP    TBN   CPUDFG,X'FF'            HAVE BOTH A UDT AND CPU RECD BEEN
   1057 C0 90 1599             530         BF    DCPERR                  ENTERED?  IF NOT GO PRINT ERROR
                               531
   1058 0C 03 20C6 2B52        532         MVC   PNAS-1(4),C3H15         SET UP SUBROUTINE PARAMETERS TO
   1061 3C 05 20C7             533         MVI   PNAS,5                  MOVE THE SSW,UDT,// CHAIN AND
   1065 0C 03 2BA4 2B52        534         MVC   NAS-1(4),C3H15          CPU RECORDS
   106D 3C 01 2BA5             535         MVI   NAS,1
   106F 0C 01 2BCF 2BDB        536         MVC   SECT#(2),X4             SET # OF REC'DS TO MOVE
                               537
   1075 C0 87 20C8             538         B     RWRTN                   TO SUBRTN TO MOVE REC'DS
                               539
   1079 0C 04 20C7 226F        540         MVC   PNAS(5),FASINB+8        SET UP SUBRTN PAR'MS TO MOVE DCP
   107F 0C 04 2BA5 2B43        541         MVC   NAS(5),C3H0             PROGRAM TO FINAL RESTING PLACE
   1085 0C 01 2BCF 2B98        542         MVC   SECT#(2),SCTR
                               543
   1088 C0 87 20C8             544         B     RWRTN                   TO SUBRTN TO MOVE REC'DS
                               545
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   108F 0C 04 2B91 2B43        546         MVC   VTIMB+14(5),C3H0      SET UP VTOC IMAGE
   1095 0C 04 2BAB 2B39        547         MVC   DDCFM(5),C3H164
   109B F2 87 60               548         J     CONTC3
                               549
                     109E      550 QCPU    EQU   *
   109E C2 01 4800             551         LA    DDDF,XR1                LOAD XR1
   10A2 0C 04 2BAB 2B3E        552         MVC   DDCFM(5),C3H165         PREPARE DDCF TO READ CPU VTOC
   10A8 3C 00 2BAF             553         MVI   DDCF,0
                               554
   10AC C0 87 239C             555         B     WINRW                   READ CPU VTOC
   10B0 80           10B0      556         DC    XL1'80'                 READ FLAG
   10B1 4800         10B2      557         DC    AL2(DDDF)
   10B3 2BA6         10B4      558         DC    AL2(DDCFB)
                               559
   10B5 39 0F 2AAB             560         TBF   FSTCPU,X'0F'            HAS CPU ALREADY BEEN WRITTEN?
   10B9 F2 10 2A               561         JT    CONTD9                  IF SO, JUMP
                               562
   10BC C0 87 0BBA             563         B     SETO                    SET DDDF TO 0
   10C0 4C 01 15 0A03          564         MVC   21(2,XR1),ONE           INITIALIZE SECTOR #
   10C5 4C 03 03 2B80          565         MVC   3(4,XR1),ACTO           INITIALIZE CPU VTOC TO WHAT IT
   10CA 4C 02 06 2AED          566         MVC   6(3,XR1),CPUIDZ-1       SHOULD BE
   10CF 4C 00 08 2ACA          567         MVC   8(1,XR1),SAVEID         PUT IN LEVEL
   10D4 4C 04 0E 2B6B          568         MVC   14(5,XR1),C0H048        PUT IN CCHHR
   10D9 4C 14 9F 3110          569         MVC   159(21,XR1),ADMSG+38    INSERT PN & EC FIELD
   10DE 4C 1F BF 3138          570         MVC   191(32,XR1),ADMSG+78    INSERT COMMENT FIELD
   10E3 F2 87 05               571         J     WCPUVT                  SKIP TO PREPARE TO WRITE
                               572
   10E6 4E 01 15 0A03          573 CONTD9  ALC   21(2,XR1),ONE           UPDATE # OF SECTORS
                               574
   10EB 3C 00 2BAF             575 WCPUVT  MVI   DDCF,0                  WRITE 1 RECORD
   10EF F2 87 2C               576         J     WRT3                    GO WRITE RECORD
   10F2 0C 04 2B91 2B61        577 QFFA    MVC   VTIMB+14(5),FFALOC      SET UP VTOC IMAGE
   10F8 0C 04 2BAB 2B2F        578         MVC   DDCFM(5),C3H162
                               579
   10FE 3C 00 2BAF             580 CONTC3  MVI   DDCF,0                  SET UP  REST OF DDCF  FLD
   1102 0C 02 2B89 2AC9        581         MVC   VTIMB+6(3),SAVEID-1     FILL IN ID
   1108 0C 00 2B8B 2ACA        582         MVC   VTIMB+8(1),SAVEID       FILL IN LEVEL
                               583
   110E C0 87 0B78             584         B     SETTO                   SET DDDF TO ZERO
   1112 0C 1C 481C 2B9F        585         MVC   DDDF+28(29),VTIM        MOVE IMAGE IN DDDF FIELD
   1118 0C 5F 48DF 0A74        586         MVC   DDDF+223(96),SAVID      MOVE IN HEADER CARD IMAGE
                               587
   111E C0 87 239C             588 WRT3    B     WINRW                   WRITE VTOC INFO
   1122 40           1122      589         DC    XL1'40'                 WRITE FLAG
   1123 4800         1124      590         DC    AL2(DDDF)               @ OF DDDF
   1125 2BA6         1126      591         DC    AL2(DDCFB)              @ OF DDCF
   1127 C0 87 12AA             592         B     CONTC9                  PRINT A MESSAGE
                               593
                               593
                               593
                               594 ********************************************************************
                               595 *          ADD THE FIRST PROGRAM TO A VIRGIN PACK                  *
                               596 ********************************************************************
                               597
                               597
   112B 0C 02 2B89 0A6F        598 NWRT    MVC   VTIMB+6(3),IDLOC        SET UP ID FOR 1ST VTOC RECORD
   1131 0C 00 2B8B 0A70        599         MVC   VTIMB+8(1),IDLOC+1      PUT IN LEVEL
   1137 0C 04 2B91 2B48        600         MVC   VTIMB+14(5),C4H0R1      PUT DISK ADDRESS IN
   113D 0C 04 2BAB 2B4D        601         MVC   DDCFM(5),C2H0R1         SET UP DDCF FIELD
   1143 0C 1C 481C 2B9F        602         MVC   DDDF+28(29),VTIM        SET UP VTOC FIELD
   1149 0C 5F 48DF 0A74        603         MVC   DDDF+223(96),SAVID
   114F C0 87 0FEF             604         B     WRTVTC
                               605
                               605
                               605
                               606 ********************************************************************
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         607 *            REP CARD ERROR HANDLING ROUTINE                    *
                         608 ************************************************************************
                         609
                         610 REPERR B     PRINT              PRINT 'ERROR IN REP CARD'
1153 C0 87 021A          1157 611         DC    XL1'C2'      FLAG
1157 C2                  1158 612         DC    AL1(ERR5-ERR5B)  LENGTH
1158 22                  115A 613         DC    AL2(ERR5)    ADDRESS OF MESSAGE
1159 2EBA                115C 614         DC    XL2'FFE5'    ID
115B FFE5                     615
                              616         B     PRINT2       PRINT CARD IMAGE
115D C0 87 2A77               617
                              618         B     HALT         TO DCP HALT
1161 C0 87 0222          1166 619         DC    XL2'FFE5'    ID
1165 FFE5                     620
                              621         B     LOOP1
1167 C0 87 0E32               622
                              622
                              622
                              622
                              622
                              622
                              622
                              622
                              623 ************************************************************************
                              624 *            ADD CPU-MEMORY OR FFA CARD DECKS                    *
                              625 ************************************************************************
                              626
                              626
                         116B 627 ADDFFA EQU   *
                              628         SBN   CPUFG,X'F0'  SET FLAG FOR FFA MODE
1168 3A F0 2AAA               629
                         116F 630 ADDCPU EQU   *
                              631
                              632         LA    DDDF,XR1     LOAD XR1
116F C2 01 4800               633         ZAZ   SEQCTR(4),D1(1)  INITIALIZE SEQUENCE COUNTER
1173 04 30 2B0B 2ADB          634         MVC   TEMP3(2),ZERO  ZERO OUT POINTER
1179 0C 01 2277 2B47          635
                              636 GET5    B     RECORD       READ A RECORD
117F C0 87 2749               637
                              638         CLI   0(,XR2),C'E' IS IT AN END CARD?
1183 8D C5 00                 639         JE    END2
1186 F2 81 4B                 640         CLI   0(,XR2),C'T' IS IT A TEXT CARD?
1189 8D E3 00                 641         BNE   INVCD        GO TO INVALID CARD RTN
118C C0 01 1521               642
                              643         CLC   95(4,XR2),SEQCTR  DOES SEQUENCE # MATCH THE EXPECTED
1190 8D 03 5F 2B0B            644         BNE   INVSEQ              SEQUENCE #?
1195 C0 01 1541               645         CLC   91(4,XR2),SAVEID  DOES ID MATCH EXPECTED ID?
1199 8D 03 5B 2ACA            646         BNE   INVID
119E C0 01 1572               647
                              648         AZ    SEQCTR(4),D1(1)  INCREMENT SEQUENCE COUNTER
11A2 06 30 2B0B 2ADB          649         B     CMPRS1       COMPRESS DATA
11A8 C0 87 1F59               650
                              651         MVI   READIN,0     ZERO OUT HIGH ORDER BYTE
11AC 3C 00 0A80               652
                              653         ALC   TEMP3(2),READIN+1  INCREMENT POINTER
11B0 0E 01 2277 0A81          654         ALC   TEMP3(2),ONE  ADJUST IT
11B6 0E 01 2277 0A03          655         CLC   TEMP3(2),X256  IS POINTER TOO HIGH
11BC 0D 01 2277 2B77          656         JH    STP2         IF IT IS PRINT ERROR
11C2 F2 84 44                 657
                              658         MVC   65(66,XR1),69(,XR2)  STRIP OFF LENGTH AND ADDRESS AND
11C5 6C 41 41 45              659 *                            ADD TO CONTENTS OF SECTOR
                              660         A     READIN+1,XR1 INCREMENT FIELD POINTER
11C9 36 01 0A81               661         LA    1(,XR1),XR1  ADJUST IT
11CD D2 01 01                 662
                              663         B     GET5         IF NOT READ MORE
11D0 C0 87 117F               664
                              664
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         11D4 665 END2    EQU   *
11D4 38 0F 2AAA               666         TBN   CPUFG,X'0F'  IS IT A CPU-MEM   MODULE?
11D8 F2 10 11                 667         JT    CONTG4       THEN PUT IN CPU DDCF
                              668
11DB 0C 04 2BAB 2B61          669         MVC   DDCFM(5),FFALOC  LOAD DDCF
11E1 3C 00 2BAF               670         MVI   DDCF,0
11E5 36 F0 2AAA               671         SBF   CPUFG,X'F0'  TURN OFF FFA MODE IF IT IS ON
11E9 F2 87 0A                 672         J     WRT2
                              673
11EC 0C 04 2BAB 2B66          674 CONTG4 MVC   DDCFM(5),CMIDLC  MOVE IN DDCF FIELD TO WRITE DATA
11F2 3C 00 2BAF               675         MVI   DDCF,0       IN NEXT CPU LOCATION
                              676
11F6 C0 87 239C               677 WRT2    B     WINRW        WRITE RECORD ON DISK
11FA 40                  11FA 678         DC    XL1'40'      FLAG
11FB 4800                11FC 679         DC    AL2(DDDF)    @ OF DDDF
11FD 2BA6                11FE 680         DC    AL2(DDCFB)   @ OF DDCF
                              681
11FF C0 87 219B               682         B     STPFLD       INCREMENT CONTROL FIELD
1203 2B66                1204 683         DC    AL2(CMIDLC)
                              684
1205 C0 87 1020               685         B     FASWR        ENTER VTOC LIKE RECORD
                              686
                              686
                              686
                              687 STP2    B     PRINT        PRINT 'TOO MANY CARDS'
1209 C0 87 021A          120D 688         DC    XL1'C6'      FLAG
120D C6                  120E 689         DC    AL1(ERR8-ERR8B)  LENGTH
120E 2F                  1210 690         DC    AL2(ERR8)    ADDRESS
120F 2D86                1212 691         DC    XL2'FFE8'    ID
1211 FFE8                     692
                              693         B     HALT         TO DCP HALT RTN
1213 C0 87 0222          1218 694         DC    XL2'FFE8'    FLAG
1217 FFE8                     695
                              696         B     LINKM
1219 C0 87 0C8F               697
                              697
                              697
                              698 ************************************************************************
                              699 *      CPU & MEMORY SECTION                                            *
                              700 *      THIS SECTION PREPARES THE MODULE TO BE ADDED                    *
                              701 *      TO THE PACK.                                                    *
                              702 ************************************************************************
                              703
                              703
                         121D 704 CPUPG   EQU   *
                              705         ST    CPUPGR+3,ARR  SAVE RETURN ADDRESS IN CASE NOT
                              706 *                            CPU-MEM MODULE
                              707         CLI   88(,XR2),C'0'  IF HIGH ORDER BYTE OF MODULE NOT
121D 34 08 12A9               708         JNE   END3         ZERO THEN NOT CPU MODULE
                              709
1221 8D F0 58                 710         MVI   FADD,C'0'    RESET 3741 FORCED ADD FLAG
1224 F2 01 78                 711         TBN   FSTCPU,X'0F'  IS THIS THE SECOND MODULE?
                              712         SBF   FSTCPU,X'0F'  TURN OFF FLAG
1227 3C F0 2AA3               713         JF    CONTG1       IF NOT SECOND MODULE, THEN JUMP
122B 38 0F 2AAB               714
122F 38 0F 2AAB               715         MVC   CMIDLC(5),C1HOR1  SET TO WRITE REST OF MODULES
1233 F2 90 06                 716
                              717 CONTG1 CLC   12(2,XR2),PN  IS IT A HEADER CARD?
1236 0C 04 2B66 2B70          718         JE    CONTG2       IF NOT DON'T RESET SEQ # COUNTER
                              719
123C 8D 01 0C 2AE6            720         MVC   TEMP3(2),ZERO  ZERO OUT BYTE COUNTER
1241 F2 81 14                 721         AZ    SEQCTR(4),D1(1)  INCREMENT CARD SEQ # CTR
                              722         LA    DDDF,XR1     RESET POINTER
1244 0C 01 2277 2B47          723         B     GET5+4       ENTER CARD READ MODE, SKIPPING READ-
124A 06 30 2B0B 2ADB          724 *                            ING THE FIRST CARD.
1250 C2 01 4800               725 CONTG2 B     PACK
1254 C0 87 1183
                              726
1258 C0 87 0226
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         125C  726         DC    IL1'2'              LENGTH
                         125E  727         DC    AL2(READIN+90)      SOURCE
                         1260  728         DC    AL2(CMID)           DESTINATION
                               729
  1261 3D D0 2BD5              730         CLI   CMID,X'D0'          SEE IF LOW ORDER BYTES ARE IN THE
  1265 F2 82 3A                731         JL    END3                RANGE X'D0'-X'F5'. IF SO, IT IS A
  1268 3D F5 2BD5              732         CLI   CMID,X'F5'          CPU-MEMORY MODULE.
  126C F2 84 33                733         JH    END3
                               734
  126F 3A 0F 2AAA              735         SBN   CPUFG,X'0F'         SET CPU FLAG
                               736
  1273 04 30 2B0B 2AD4         737         ZAZ   SEQCTR(4),D0(1)     RESET SEQUENCE # COUTER
  1279 8D 03 5F 2B0B           738         CLC   95(4,XR2),SEQCTR    IS SEQUENCE # CTR =02
  127E C0 01 1541              739         BNE   INVSEQ              IF NOT GO TO ERROR HANDLING RTN
  1282 2C 5F 0A74 5F           740         MVC   SAVID(96),95(,XR2)  SAVE HEADER CARD IMAGE
  1287 2C 03 2ACA 5B           741         MVC   SAVEID(4),91(,XR2)  SAVE ID
                               742
  128C 8D 01 5A 2AD6           743         CLC   90(2,XR2),D00       IS THIS THE FIRST CPU MODULE?
  1291 F2 C1 0A                744         JNE   CONTG3              JUMP IF NOT
  1294 3A 0F 2AAB              745         SBN   FSTCPU,X'0F'        SET FIRST MODULE FLAG
  1298 0C 04 2B66 2B6B         746         MVC   CMIDLC(5),C0H048    SET DDCF TO WRITE FIRST MODULE
                               747 *                                 IN CYL 0,HD 0,REC 48
                               748
  129E C0 87 116F              749 CONTG3  B     ADDCPU              TO ADD CPU PROGRAM TO PACK
                               750
  12A2 3B 0F 2AAA              751 END3    SBF   CPUFG,X'0F'         RESET CPU FLAG
  12A6 C0 87 0000              752 CPUPGR  B     *-*                 RETURN TO CALLER
                               753
                               753
                               753
                               753
                               753
                               753
                               753
                               754 *********************************************************************
                               755 *      PRINT INFO ON PROGRAM ADDED AND QUIT OR                      *
                               756 *      GET READY TO ADD ANOTHER PROGRAM                             *
                               757 *********************************************************************
                               758
                               758
  12AA 0D 01 30FD 2AE6         759 CONTC9  CLC   ADMSG+19(2),PN        IS MESSAGE TO BE PRINTED VALID?
  12B0 F2 01 18                760         JNE   GET3-4                IF NOT, THEN DON'T PRINT IT
                               761
  12B3 0C 02 30F4 2AC9         762         MVC   ADMSG+10(3),SAVEID-1  MOVE ID INTO PRINT FIELD
  12B9 3C 50 30F5              763         MVI   ADMSG+11,C'-'         INSERT -
  12BD 0C 00 30F6 2ACA         764         MVC   ADMSG+12(1),SAVEID    MOVE LEVEL # INTO PRINT FIELD
  12C3 C0 87 021A              765         B     PRINT                 PRINT 'ADDED-- XXX ETC.'
  12C7 02              12C7    766         DC    XL1'02'               FLAG
  12C8 4F              12C8    767         DC    AL1(ADMSGE-ADMSG)     LENGTH
  12C9 3138            12CA    768         DC    AL2(ADMSGE-1)         ADDRESS
                               769
  12CB C2 01 4800              770         LA    DDDF,XR1
  12CF C0 87 2749              771 GET3    B     RECORD                READ A RECORD
  12D3 AD 5F 5F 60             772         CLC   95(96,XR2),96(,XR2)   IS IT A BLANK RECORD?
  12D7 C0 81 12CF              773         BE    GET3                  THEN FLUSH IT
                               774
  12DB 3B 0F 2AAD              775         SBF   ADDFLG,X'0F'          TURN OFF ADD SWITCH
  12DF BD 61 00                776         CLI   0(,XR2),C'/'          IF IT IS A '/' OR A '$' THEN GO TO
  12E2 C0 81 0C4E              777         BE    RTRN                  SECTION THAT HANDLES CONTROL CARDS
  12E6 BD 5B 00                778         CLI   0(,XR2),C'$'
  12E9 C0 81 0C4E              779         BE    RTRN
  12ED C0 87 0D2F              780         B     RTRN2                 IF NOT, ASSUME IT IS A HEADER CARD
                               781 *                                   AND GO HANDLE IT
                               782
                               782
                               782
                               782
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               783 *********************************************************************
                               784 *      THIS SECTION HANDLES COMMENT AND DCP CARDS                   *
                               785 *                                                                   *
                               786 *********************************************************************
                               787
                               787
                         12F1  788 ASTRK   EQU   *
  12F1 8D 03 5F 0B09           789         CLC   95(4,XR2),BLNK        IS THERE A SEQUENCE #?
  12F6 F2 81 18                790         JE    CONTA9                IF NOT SKIP CHECK
  12F9 8D 03 5B 2ACA           791         CLC   91(4,XR2),SAVEID      IS ID SAME AS HEADER CARD
  12FE C0 01 1572              792         BNE   INVID                 GO HANDLE IT
  1302 8D 03 5F 2B0B           793         CLC   95(4,XR2),SEQCTR      ARE SEQ #'S EQUAL?
  1307 C0 01 1541              794         BNE   INVSEQ                IF NOT PRINT ERROR
  130B 06 30 2B0B 2ADB         795         AZ    SEQCTR(4),D1(1)       INCREMENT SEQCTR
                               796
  1311 6C 5F 5F 5F             797 CONTA9  MVC   95(96,XR1),95(,XR2)    LOAD DDDF
  1315 C0 87 0F19              798         B     LOOP4
                               799
  1319 3C 08 2BBF              800 DCPCD1  MVI   DDCFSM,8                SET TO OPERATE ON RECORD 8
  131D 38 F0 2AA0              801         TBN   DCPFG,X'F0'           IF ADDING SSW TO DCP THEN DESTROY
  1321 F2 10 08                802         JT    PRWR                  OLD ONE.
  1324 8D 01 05 0B09           803         CLC   5(2,XR2),BLNK         IF FIELD IS BLANK THEN DESTROY
  1329 F2 01 07                804         JNE   NBLNK                 EXISTING ONE
  132C 6C 5F 5F 5F             805 PRWR    MVC   95(96,XR1),95(,XR2)   MOVE IN NEW RECORD AND GO WRITE IT
  1330 F2 87 F6                806         J     WRT1
                               807
  1333 34 01 1347              808 NBLNK   ST    TMADR,XR1             STORE XR1
  1337 0C 03 2BBE 2B52         809         MVC   DDCFSM-1(4),C3H15     READ IN EXISTING SSW RECORD
  133D 3C 00 2BC3              810         MVI   DDCFS,0
  1341 C0 87 239C              811         B     WINRW
  1345 80              1345    812         DC    XL1'80'               READ FLAG
  1346 0000            1347    813 TMADR   DC    AL2(*-*)
  1348 2BBA            1349    814         DC    AL2(DDCFSB)
                               815
  134A 4D 02 02 2AFA           816         CLC   2(3,XR1),SSWID
  134F C0 01 132C              817         BNE   PRWR                  LY THEN WRITE NEW ONE
  1353 C2 02 0A82              818         LA    READIN+2,XR2          INITIALIZE REGISTERS
  1357 D2 01 02                819         LA    2(,XR1),XR1
  135A D2 01 01                820         LA    1(,XR1),XR1           SCAN TO END OF  RECORD
  135D 7D 40 01                821         CLI   1(,XR1),C' '          IF NOT BLANK, DO AGAIN
  1360 C0 01 135A              822         BNE   *-6
  1364 7C 6B 01                823 LOOP9   MVI   1(,XR1),C','          ADD COMMA
  1367 D2 01 03                824         LA    3(,XR1),XR1           INCREMENT POINTERS
  136A E2 02 03                825         LA    3(,XR2),XR2
  136D 6C 01 00 00             826         MVC   0(2,XR1),0(,XR2)      MOVE IN NEW SSW
  1371 BD 6B 01                827         CLI   1(,XR2),C','          IF NEXT CHARACTER IS A COMMA,
  1374 C0 81 1364              828         BE    LOOP9                 THEN DON'T QUIT
                               829
  1378 35 01 1347              830         L     TMADR,XR1             RESTORE REGISTERS
  137C C2 02 0A80              831         LA    READIN,XR2
  1380 F2 87 A6                832         J     WRT1                  GO WRITE RECORD
                               833
  1383 3C 07 2BBF              834 DCPCD2  MVI   DDCFSM,7              WRITE INFO IN RECORD 7
  1387 7C 40 FF                835         MVI   255(,XR1),C' '        BLANK OUT
  138A 5C FE FE FF             836         MVC   254(255,XR1),255(,XR1)          ENTIRE DDDF
  138E BD E2 09                837         CLI   9(,XR2),C'S'          DO COL'S 10-12='STD'?
  1391 F2 81 95                838         JE    WRT1                  GO WRITE IT
                               839
  1394 6C 0B 0B 0B             840         MVC   11(12,XR1),11(,XR2)   MOVE IN CARD IMAGE OF // CHAIN
  1398 34 01 143D              841         ST    TEMADR,XR1            SAVE XR1 IN ORDER TO RESTORE IT
  139C 3C 02 2BEA              842         MVI   ICTR,2                PREPARE TO READ IN 2 CARDS
                               843
  13A0 4D 02 0B 2ADE           844         CLC   11(3,XR1),D48         IS IT A 48 IMAGE CHAIN?
  13A5 F2 81 0D                845         JE    GET7                  IF IT IS, JUMP
  13A8 4D 02 0B 2AE1           846         CLC   11(3,XR1),D120        IF NOT =120 THEN ERROR
  13AD C0 01 15AD              847         BNE   CHNERR
                               848
  13B1 3C 05 2BEA              849         MVI   ICTR,5                PREPARE TO READ IN 5 CARDS
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   13B5 C0 87 2A2F            850 GET7   B     PRINT1          DISPLY 'ENTER CHAIN IMAGE ...'
   13B9 06              13B9  851        DC    XL1'06'         FLAG
   13BA 26              13BA  852        DC    AL1(MENU4-MENU4B)  LENGTH
   13BB 3435            13BC  853        DC    AL2(MENU4)      MESSAGE ADDRESS
   13BD C0 87 2749            854        B     RECORD          READ A RECORD
                              855
   13C1 3C 30 2BEB            856        MVI   LCTR,48         SET LOOP COUNTER
   13C5 BD 40 00              857 LOOP30 CLI   0(,XR2),C' '    IS IT A BLANK CHARACTER?
   13C8 C0 81 15AD            858        BE    CHNERR          IF SO GO PRINT ERROR
   13CC E2 02 01              859        LA    1(,XR2),XR2     INCREMENT ADDRESS POINTER
   13CF 0F 00 2BEB 0A03       860        SLC   LCTR(1),ONE     DECREMENT COUNTER
   13D5 C0 01 13C5            861        BNZ   LOOP30          IF NOT EQUAL TO ZERO, DO OVER
   13D9 C2 02 0A80            862        LA    READIN,XR2      INITIALIZE XR2
                              863
   13DD 6C 2F 3B 2F           864        MVC   59(48,XR1),47(,XR2)  MOVE IN CHAIN IMAGE CARD
   13E1 D2 01 30              865        LA    48(,XR1),XR1    INCREMENT POINTER
   13E4 0F 00 2BEA 0A03       866        SLC   ICTR(1),ONE     DECREMENT COUNTER
   13EA C0 01 13B5            867        BNZ   GET7            IF NOT 0, READ ANOTHER RECORD
                              868
   13EE 35 01 143D            869        L     TEMADR,XR1      RESTORE POINTER TO ORIGINAL POS.
   13F2 F2 87 34              870        J     WRT1            GO WRITE RECORD
                              871
   13F5 BD 40 03              872 DCPCD3 CLI   3(,XR2),C' '    IS IT A UDTX RECORD?
   13F8 F2 81 0B              873        JE    DCPCN4          IF NOT, THEN SKIP
   13FB 38 F0 2A9C            874        TBN   CPUDFG,X'F0'    HAS A UDT RCD ALREADY BEEN ENTERED?
   13FF C0 10 1E1D            875        BT    UDTXP           IF SO, THEN ADD UDTX RECORD
   1403 F2 87 3A              876        J     DCPCN2          OTHERWISE CONTINUE PROCESSING
                              877
   1406 8D 01 05 2B07         878 DCPCN4 CLC   5(2,XR2),WINID   IS LOADER ID='C1'
   140B F2 01 32              879        JNE   DCPCN2
   140E 6C 5F 5F 5F           880        MVC   95(96,XR1),95(,XR2)  WRITE UDT RECORD
   1412 3C 06 2BBF            881        MVI   DDCFSM,6        WRITE AT REC. 6
   1416 3A F0 2A9C            882        SBN   CPUDFG,X'F0'    SET FLAG SAYING UDT IS ENTERED
   141A F2 87 0C              883        J     WRT1            GO WRITE RECORD
                              884
   141D 6C 5F 5F 5F           885 DCPCD4 MVC   95(96,XR1),95(,XR2)  WRITE CPU RECORD
   1421 3C 05 2BBF            886        MVI   DDCFSM,5        WRITE AT REC. 5
   1425 3A 0F 2A9C            887        SBN   CPUDFG,X'0F'    SET FLAG SAYING CPU REC IS ENTERED
                              888
   1429 0C 03 2BBE 2B52       889 WRT1   MVC   DDCFSM-1(4),C3H15  SET DDCF TO WRITE 1 RECORD
   142F 3C 00 2BC3            890        MVI   DDCFS,0
                              891
   1433 34 01 143D            892        ST    TEMADR,XR1      SET DDDF PARAMETER
                              893
   1437 C0 87 239C            894        B     WINRW           WRITE 1 RECORD AT C3H15RX
   143B 40              143B  895        DC    XL1'40'         WRITE FLAG
   143C 0000            143D  896 TEMADR DC    AL2(*-*)        @ OF DDDF FIELD
   143E 2BBA            143F  897        DC    AL2(DDCFSB)     @ OF DDCF FIELD
                              898
   1440 38 0F 2AAE            899 DCPCN2 TBN   CFIGFG,X'0F'    IS THIS $CONFIG OPTION?
   1444 C0 10 1F00            900        BT    CFRTRN          IF SO RETURN TO IT
   1448 38 F0 2AA0            901        TBN   DCPFG,X'F0'     IF FROM $REP, THEN GO TO 'RTRN3'
   144C C0 90 1707            902        BF    RTRN3A
   1450 C0 87 0E32            903        B     LOOP1           OTHERWISE RETURN TO READING CARDS
                              904 *                            IN $ADD
                              905
                              905
                              905
                              906 ********************************************************************
                              907 *      THIS SECTION TESTS TO SEE IF THIS IS                        *
                              908 *      A DCP DECK, AND IF IT IS, IT PREPARES                       *
                              909 *      IT TO BE ADDED.                                             *
                              910 *                                                                  *
                              911 ********************************************************************
                              912
                              912
   1454 8D 02 3E 2B1C         913 TSTDCP CLC   62(3,XR2),DCPID  IS IT A DCP MODULE?
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   1459 F2 81 12              914        JE    HDRDCP
                              915
   145C 38 01 020A            916        TBN   SWITCH,SSW17    CHECK IF USING 3741
   1460 F2 90 96              917        JF    INVHDR          INVALID HEADER NOT FROM 3741
   1463 3D F0 2AA3            918        CLI   FADD,C'0'        CHECK FOR FORCED ADD
   1467 C0 01 0C67            919        BNE   FLAGS           INVALID CONTROL RECORD
   146B F2 81 8B              920        JE    INVHDR          INVALID HEADER RECORD
   146E 3C F0 2AA3            921 HDRDCP MVI   FADD,C'0'       RESET 3741 FORCED ADD FLAG
   1472 2C 02 2AC9 3E         922        MVC   SAVEID-1(3),62(,XR2)  SAVE DCP ID FOR FUTURE COMPARES
   1477 2C 00 2ACA 3B         923        MVC   SAVEID(1),59(,XR2)
   147C 3C FF 2AA0            924        MVI   DCPFG,X'FF'     SET DCP FLAG
   1480 2C 14 0A34 34         925        MVC   SAVIDB+31(21),52(,XR2)  ADJUST PN & EC FIELDS
   1485 0C 1F 0A54 315F       926        MVC   SAVIDB+63(32),DCPP  INSERT COMMENT FIELD
   148B 2C 14 3110 34         927        MVC   ADMSG+38(21),52(,XR2)  DO THE SAME FOR THE MESSAGE
   1490 0C 1F 3138 315F       928        MVC   ADMSG+78(32),DCPP  PRINTED AT END OF OPERATION
                              929
   1496 3C 04 2BEA            930        MVI   ICTR,4          SET UP LOOP COUNTER
   149A C0 87 0B8A            931 LOOP19 B     SETO            SET DDDF TO 0
   149E 36 01 2B77            932        A     X256,XR1        INCREMENT FIELD POINTER
   14A2 0F 00 2BEA 0A03       933        SLC   ICTR(1),ONE     DECREMENT COUNTER
   14A8 C0 01 149A            934        BNZ   LOOP19          TAKE BRANCH IF CTR NOT 0
                              935
   14AC 0C 03 2BAA 2B52       936        MVC   DDCFM-1(4),C3H15  SET UP DDCF FIELD
   14B2 3C 05 2BAB            937        MVI   DDCFM,5
   14B6 3C 03 2BAF            938        MVI   DDCF,3
                              939
   14BA C0 87 239C            940        B     WINRW           WRITE 4 RECORDS OF 0
   14BE 40              14BE  941        DC    XL1'40'         WRITE FLAG
   14BF 4800            14C0  942        DC    AL2(DDDF)
   14C1 2BA6            14C2  943        DC    AL2(DDCFB)
                              944
   14C3 3C 05 2BEA            945        MVI   ICTR,5          INITIALIZE COUNTER
   14C7 C2 01 4800            946        LA    DDDF,XR1        INITIALIZE ADDRESS POINTER
   14CB C0 87 2749            947 LOOP3  B     RECORD          READ NEXT RECORD
   14CF 0F 00 2BEA 0A03       948        SLC   ICTR(1),ONE     INCREMENT COUNTER
   14D5 C0 01 14CB            949        BNZ   LOOP3           IF NOT READ ANOTHER RECORD
   14D9 3C FF 2AA0            950        MVI   DCPFG,X'FF'     SET DCP FLAG
   14DD C0 87 2749            951 GET4   B     RECORD          GET NEXT  RECORD
   14E1 C0 87 1F59            952        B     CMPRS1          COMPRESS RECORD
   14E5 BD 02 02              953        CLI   2(,XR2),2       IS ADDRESS < 200?
   14E8 C0 01 14DD            954        BNE   GET4           GET ANOTHER RECORD IF IT IS
   14EC 24 03 2B0B 5F         955        ZAZ   SEQCTR(4),95(4,XR2)  INITIALIZE TO   CURRENT SEQUENCE
                              956
   14F1 3C FF 2A9B            957        MVI   NWRITFG,X'FF'   SET NO WRITE ON VTOC FLAG
   14F5 C0 87 0DF1            958        B     DCPCT1          THEN TAKE THIS JUMP
                              959
                              959
                              959
                              960 ********************************************************************
                              961 *      THIS SECTION HANDLES ERRORS IN CARDS                        *
                              962 ********************************************************************
                              963
                              963
   14F9 C0 87 021A            964 INVHDR B     PRINT           PRINT 'INVALID HEADER CARD'
   14FD C6              14FD  965        DC    XL1'C6'         FLAG
   14FE 32              14FE  966        DC    AL1(ERR3-ERR3B)  LENGTH
   14FF 2D57            1500  967        DC    AL2(ERR3)       ADDRESS
   1501 FFE3            1502  968        DC    XL2'FFE3'       ID
   1503 C0 87 0222            969        B     HALT            TO DCP HLT RTN
   1507 FFE3            1508  970        DC    XL2'FFE3'       ID
   1509 C0 87 08CB            971        B     EDITAA          RETURN
                              972
   150D C0 87 021A            973 INVSCD B     PRINT           PRINT 'INVALID SYS TST HDR CARD'
   1511 C6              1511  974        DC    XL1'C6'         FLAG
   1512 1F              1512  975        DC    AL1(ERR4-ERR4B)  LENGTH
   1513 2F56            1514  976        DC    AL2(ERR4)       ADDRESS
   1515 FFE4            1516  977        DC    XL2'FFE4'       FLAG
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    1517 C0 87 0222              978        B     HALT               TO   DCP HALT
    151B FFE4               151C  979        DC    XL2'FFE4'          FLAG
    151D C0 87 0BCB              980        B     EDITAA             GET ANOTHER RECORD
                                 981
                                 981
    1521 C0 87 021A              982 INVCD  B     PRINT              PRINT'INVALID CARD ...'
    1525 C2                 1525  983        DC    XL1'C2'            FLAG
    1526 22                 1526  984        DC    AL1(ERR5-ERR5B)    LENGTH
    1527 2EBA               1528  985        DC    AL2(ERR5)          ADDRESS
    1529 FFE5               152A  986        DC    XL2'FFE5'          ID
    152B C0 87 2A77              987        B     PRINT2             PRINT CARD IMAGE
                                 988
    152F C0 87 0222              989        B     HALT               HALT 'E5'
    1533 FFE5               1534  990        DC    XL2'FFE5'
                                 991
    1535 3D 00 2AAA              992        CLI   CPUFG,0            IF NOT CPU OR MEMORY MODULE -
    1539 C0 81 0E32              993        BE    LOOP1              GO TO LOOP1
    153D C0 87 117F              994        B     GET5               GO READ THE CARD
                                 995
                                 995
    1541 2C 03 2EE1 5F           996 INVSEQ MVC   ERR6A(4),95(,XR2)  MOVE EXPECTED ID INTO MESSAGE
    1546 0C 03 2EF6 280B         997        MVC   ERR6C(4),SEQCTR    MOVE RECEIVED ID INTO STORAGE
                                 998
    154C C0 87 021A              999        B     PRINT              PRINT 'INVALID SEQUENCE'
    1550 C6                 1550 1000        DC    XL1'C6'            FLAG
    1551 4A                 1551 1001        DC    AL1(ERR6-ERR6B)    LENGTH
    1552 2F04               1553 1002        DC    AL2(ERR6)          ADDRESS
    1554 FFE6               1555 1003        DC    XL2'FFE6'          ID
    1556 C0 87 0222             1004        B     HALT
    155A FFE6               155B 1005        DC    XL2'FFE6'
                                1006
    155C 0D 03 280B 2AD4        1007        CLC   SEQCTR(4),D0       IS SEQ # SUPPOSED TO BE ZERO
    1562 C0 81 0D23             1008        BE    GET2
                                1009
    1566 3D 00 2AAA             1010        CLI   CPUFG,0            IF NOT CPU OR MEMORY MODULE -
    156A C0 81 0E32             1011        BE    LOOP1              GO TO LOOP1
    156E C0 87 117F             1012        B     GET5               GO READ THE CARD
                                1013
                                1013
                                1013
                                1013
    1572 2C 03 2F21 5B          1014 INVID  MVC   ERR7A(4),91(,XR2)  MOVE RECEIVED ID
    1577 0C 03 2F37 2ACA        1015        MVC   ERR7(4),SAVEID     MOVE EXPECTED ID
                                1016
    157D C0 87 021A             1017        B     PRINT              PRINT 'INVALID ID'
    1581 C6                 1581 1018        DC    XL1'C6'            FLAG
    1582 33                 1582 1019        DC    AL1(ERR7-ERR7B)    LENGTH
    1583 2F37               1584 1020        DC    AL2(ERR7)          ADDRESS
    1585 FFE7               1586 1021        DC    XL2'FFE7'          ID
    1587 C0 87 0222             1022        B     HALT
    158B FFE7               158C 1023        DC    XL2'FFE7'
                                1024
    158D 3D 00 2AAA             1025        CLI   CPUFG,0            IF NOT CPU OR MEMORY MODULE -
    1591 C0 81 0E32             1026        BE    LOOP1              GO TO LOOP1
    1595 C0 87 117F             1027        B     GET5               GO READ THE CARD
                                1028
                                1028
    1599 C0 87 021A             1029 DCPERR B     PRINT              PRINT 'MISSING UDT AND/OR UDT
    159D C6                 159D 1030        DC    XL1'C6'                   RECORD'
    159E 40                 159E 1031        DC    AL1(ERR10-ERR10B)  LENGTH
    159F 2DF6               15A0 1032        DC    AL2(ERR10)         MESSAGE ADDRESS
    15A1 FFEA               15A2 1033        DC    XL2'FFEA'          ID
                                1034
    15A3 C0 87 0222             1035        B     HALT               TO DCP HALT RTN
    15A7 FFEA               15A8 1036        DC    XL2'FFEA'          ID
                                1037
    15A9 C0 87 0BCE             1038        B     EDITAA             RETURN TO READ CONTROL CARD
                                1039
```



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DD62     3340 CE DISK EDITOR       MOD 12

ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

    15AD C0 87 021A             1040 CHNERR B     PRINT              PRINT 'ERROR IN CHAIN RECORD'
    15B1 C2                 15B1 1041        DC    XL1'C2'            FLAG
    15B2 2E                 15B2 1042        DC    AL1(ERREB-ERREBB)  LENGTH
    15B3 2E24               15B4 1043        DC    AL2(ERREB)         MESSAGE ADDRESS
    15B5 FFEB               15B6 1044        DC    XL2'FFEB'          ID
                                1045
    15B7 C0 87 2A77             1046        B     PRINT2             PRINT CARD IMAGE
                                1047
    15BB 38 0F 2AAE             1048        TBN   CFIGFG,X'0F'       RETURN TO CONFIGURE PROGRAM?
    15BF C0 10 1DBD             1049        BT    CFRT               IF SO, RETURN
    15C3 C0 87 0222             1050        B     HALT               OTHERWISE HALT AND TERMINATE
    15C7 FFEB               15C8 1051        DC    XL2'FFEB'          HALT ID
    15C9 C0 87 0E32             1052        B     LOOP1              TERMINATE SECTION
                                1053
                                1053
                                1053
                                1053
    15CD C0 87 021A             1054 SCNERR B     PRINT              PRINT 'SCAN ERROR- RETRY'
    15D1 C6                 15D1 1055        DC    XL1'C6'
    15D2 2E                 15D2 1056        DC    AL1(SCERR-SCERRB)
    15D3 2F84               15D4 1057        DC    AL2(SCERR)
    15D5 FFED               15D6 1058        DC    XL2'FFED'
    15D7 C0 87 0222             1059        B     HALT               HALT  - ED
    15DB FFED               15DC 1060        DC    XL2'FFED'
    15DD C0 87 15D7             1061        B     *-6
                                1062
                                1062
                                1062
                                1062
                                1062
                                1062
                                1062
                                1062
                                1063 ******************************************************************
                                1064 ******************************************************************
                                1065 **      $DEL                                                    **
                                1066 **                                                              **
                                1067 **      THIS PART OF THE PROGRAM DELETES PROGRAMS ON THE CE DATA **
                                1068 **      MODULE .                                                **
                                1069 **                                                              **
                                1070 ******************************************************************
                                1071 ******************************************************************
                                1072
                                1072
                        15E1 1073 DEL1   EQU   *                  ENTRY POINT FOR $DEL
                                1074
    15E1 36 0F 2BF0             1075        SBF   DELFG,X'0F'        RESET $DEL FLAG
    15E5 3C 60 30F5             1076        MVI   ADMSG+11,C'-'      SET UP MESSAGE TO PRINT
    15E9 0C 06 30F0 30E9        1077        MVC   ADMSG+6(7),PGMDEL
    15EF 1C 14 3110 9E          1078        MVC   ADMSG+38(21),158(,XR1)
    15F4 1C 1F 3138 BF          1079        MVC   ADMSG+78(32),191(,XR1)
                                1080
    15F9 C0 87 021A             1081        B     PRINT              PRINT 'XXX DELETED'
    15FD 02                 15FD 1082        DC    XL1'02'            FLAG
    15FE 4F                 15FE 1083        DC    AL1(ADMSGE-ADMSG)  LENGTH
    15FF 3138               1600 1084        DC    AL2(ADMSGE-1)      MESSAGE ADDRESS
                                1085
    1601 BD 6B 07               1086 DEL2   CLI   7(,XR2),C','       IS THERE ANOTHER PRGM TO DELETE?
    1604 C0 01 0BCB             1087        BNE   EDITAA             IF NOT, THEN QUIT
    1608 E2 02 04               1088        LA    4(,XR2),XR2        INCREMENT XR2 TO HANDLE NEXT PGM
                                1089
                                1089
                        160B 1090 DELPGM EQU   *
    160B 3A 0F 2BF0             1091        SBN   DELFG,X'0F'        SET DELETE FLAG
    160F 2C 02 2AC9 06          1092        MVC   SAVEID-1(3),6(,XR2) SAVE ID OF PROGRAM TO BE DELETED
                                1093
                                1093
                                1093
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1094 ********************************************************************************
                         1095 ********************************************************************************
                         1096 **      $REP                                                                  **
                         1097 **                                                                            **
                         1098 **      THIS PART OF THE PROGRAM ADDS REP, SSW, AND COMMENT RECORDS           **
                         1099 **      TO ANY PROGRAM ALREADY ON THE 3340 CE DATA MODULE.                    **
                         1100 **                                                                            **
                         1101 ********************************************************************************
                         1102 ********************************************************************************
                         1103
                         1103
                         1103
                         1103
                        1614 1104 REPPGM EQU   *
1614 3C 00 2A9E          1105        MVI   LWRT,0              ZERO LAST WRITE FLAG
1618 3A 0F 2AAD          1106        SBN   ADDFLG,X'0F'        SET FLAG TO RECORD CARD IMAGE IN
                         1107 *                                 DISK FIELD
161C C2 01 4800          1108        LA    DDDF,XR1            LOAD  XR1
1620 2C 06 3458 06       1109        MVC   REPWHO(7),6(,XR2)   AND SAVE AREA
1625 2C 06 3644 06       1110        MVC   REPWH1(7),6(,XR2)   MOVE IN REP PROGRAM ID
162A 2C 02 1669 06       1111        MVC   PRGID(3),6(,XR2)    MOVE PROGRAM ID INTO DISPLAY AREA
162F 38 0F 2BF0          1112        TBN   DELFG,X'0F'         IN $DEL MODE?
1633 C0 10 17BB          1113        BT    RPCNT7              IF SO, THEN SKIP
                         1114
1637 8D 02 06 2B1C       1115        CLC   6(3,XR2),DCPID      IS ID 'FFF'?
163C F2 01 23            1116        JNE   RPCNT1              IF NOT SKIP NEXT SECTION
                         1117
163F 0C 04 2BAB 2B39     1118        MVC   DDCFM(5),C3H164     SET CONTROL FIELD FOR DCP VTOC
1645 3C 00 2BAF          1119        MVI   DDCF,0              FOR 1 RECORD
1649 C0 87 239C          1120        B     WINRW               READ DCP VTOC
164D 80                 164D 1121        DC    XL1'80'             READ FLAG
164E 4800               164F 1122        DC    AL2(DDDF)
1650 2BA6               1651 1123        DC    AL2(DDCF+8)
                         1124
1652 4D 02 06 2B1C       1125        CLC   6(3,XR1),DCPID      IS DCP ON THIS DATA MODULE?
1657 C0 01 1820          1126        BNE   PGNTF               IF NOT PRINT SO.
165B 3C 0F 2AA0          1127        MVI   DCPFG,X'0F'         SET DCP FLAG
165F F2 87 10            1128        J     RPCNT2
                         1129
1662 C0 87 227A          1130 RPCNT1 B     SCNVTC              SCAN VTOC FOR PROGRAM TO REP
1666 00                 1666 1131 FLAG    DC    XL1'0'              BYTE TO TELL RESULTS OF SCAN
1667 D7C9C4             1669 1132 PRGID   DC    CL3'PID'            PROGRAM ID
                         1133
166A 3D 00 1666          1134        CLI   FLAG,0              IF SCAN HIT, DON'T TAKE BRANCH
166E C0 81 1820          1135        EE    PGNTF
                         1136
1672 1C 5F 0A74 DF       1137 RPCNT2 MVC   SAVID(96),223(,XR1) SAVE HEADER CARD IMAGE
1677 1C 1C 2B9F 1C       1138        MVC   VTIM(29),28(,XR1)
167C 0C 01 2BCF 2B98     1139        MVC   SECT#(2),VTIMB+21   STOR # OF SECTORS
1682 3D 0F 2AA0          1140        CLI   DCPFG,X'0F'         IS DCP FLAG SET?
1686 F2 01 29            1141        JNE   RPCNT3              SKIP NEXT SECTON IF IT IS NOT
                         1142
1689 0C 01 20BB 2BCF     1143        MVC   TEMP1(2),SECT#      SET NUMBER OF REC'DS TO SKIP
168F 0F 01 20BB 0A03     1144        SLC   TEMP1(2),ONE        ADJUST IT
1695 0C 04 2BC9 2B43     1145        MVC   DDCFTM(5),C3H0      PUT CONTROL FIELD TO DCP ADDRESS
169B 3C 00 2BCD          1146        MVI   DDCFT,0
                         1147
169F C0 87 219B          1148 LOOP6  B     STPFLD              INCREMENT CONTROL FIELD
16A3 2BC9               16A4 1149        DC    AL2(DDCFTM)         CONTROL FIELD ADDRESS
16A5 0F 01 20BB 0A03     1150        SLC   TEMP1(2),ONE        DECREMENT COUNTER
16AB C0 01 169F          1151        ENZ   LOOP6               IF NOT ZERO DO IT AGAIN
16AF F2 87 15            1152        J     RPCNT4
                         1153
                         1153
                         1153
                         1154 ********************************************************************************
                         1155 *      MOVE PROGRAM TO END OF PACK AND STRIP OFF END CARD                      *
                         1156 ********************************************************************************
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

16B2 1C 04 20C7 0E       1157
16B7 0C 04 2BA5 226F     1157
16BD 0F 01 2BCF 0A03     1158 RPCNT3 MVC   PNAS(5),14(,XR1)     SET UP TWO DDCF FIELDS TO TRANSFER
                         1159        MVC   NAS(5),FASINB+8
                         1160        SLC   SECT#(2),ONE
                         1161
16C3 C0 87 20C8          1162        B     RWRTN               MOVE PROGRAM TO END OF PACK
                         1163
                         1163
                         1163
                         1164 ********************************************************************************
                         1165 *      HANDLE REP ENTRIES                                                      *
                         1166 ********************************************************************************
                         1167
                         1167
16C7 3C 00 2BCD          1168 RPCNT4 MVI   WRT#,0              SET NN FIELD TO 0
16CB C2 01 4800          1169        LA    DDDF,XR1            LOAD XR1
                         1170
16CF                    16CF 1171 RTRN3  EQU   *
16CF C0 87 2A2F          1172        B     PRINT1              DISPLAY MESSAGE 'ENTER REPS'
16D3 01                 16D3 1173        DC    XL1'01'             FLAG
16D4 26                 16D4 1174        DC    AL1(MENU51-MENU5B)  LENGTH
16D5 345B               16D6 1175        DC    AL2(MENU51)         MESSAGE ADDRESS
16D7 C0 87 2A2F          1176        B     PRINT1              DISPLAY MESSAGE 'ENTER REPS'
16DB 01                 16DB 1177        DC    XL1'01'             FLAG
16DC 28                 16DC 1178        DC    AL1(MENU53-MENU5D)  LENGTH
16DD 3485               16DE 1179        DC    AL2(MENU53)         MESSAGE ADDRESS
16DF C0 87 2A2F          1180        B     PRINT1              DISPLAY MESSAGE 'ENTER REPS'
16E3 01                 16E3 1181        DC    XL1'01'             FLAG
16E4 28                 16E4 1182        DC    AL1(MENU54-MENU5E)  LENGTH
16E5 34AB               16E6 1183        DC    AL2(MENU54)         MESSAGE ADDRESS
16E7 C0 87 2A2F          1184        B     PRINT1              DISPLAY MESSAGE 'ENTER REPS'
16EB 01                 16EB 1185        DC    XL1'01'             FLAG
16EC 28                 16EC 1186        DC    AL1(MENU55-MENU5F)  LENGTH
16ED 34D3               16EE 1187        DC    AL2(MENU55)         MESSAGE ADDRESS
16EF C0 87 2A2F          1188        B     PRINT1              DISPLAY MESSAGE 'ENTER REPS'
16F3 01                 16F3 1189        DC    XL1'01'             FLAG
16F4 28                 16F4 1190        DC    AL1(MENU56-MENU5G)  LENGTH
16F5 34FB               16F6 1191        DC    AL2(MENU56)         MESSAGE ADDRESS
16F7 C0 87 2A2F          1192        B     PRINT1              DISPLAY MESSAGE 'ENTER REPS'
16FB 01                 16FB 1193        DC    XL1'01'             FLAG
16FC 28                 16FC 1194        DC    AL1(MENU57-MENU5H)  LENGTH
16FD 3523               16FE 1195        DC    AL2(MENU57)         MESSAGE ADDRESS
16FF C0 87 2A2F          1196        B     PRINT1              DISPLAY MESSAGE 'ENTER REPS'
1703 06                 1703 1197        DC    XL1'06'             FLAG
1704 28                 1704 1198        DC    AL1(MENU58-MENU5I)  LENGTH
1705 354B               1706 1199        DC    AL2(MENU58)         MESSAGE ADDRESS
                         1200
1707 C0 87 2749         1201 RTRN3A B     RECORD              READ A RECORD
                         1202
170B BD E7 00            1203        CLI   0(,XR2),C'X'        HAS AN X BEEN ENTERED?
170E C0 81 0BCB          1204        BE    EDITAA              IF SO, DON'T REP PROGRAM
                         1205
1712 BD C5 00            1206        CLI   0(,XR2),C'E'        IS IT AN END RECORD?
1715 F2 81 5E            1207        JE    ENDRP
1718 BD 5C 00            1208        CLI   0(,XR2),C'*'        IS IT A COMMENT CARD?
171B F2 81 3E            1209        JE    CONTF3
171E 8D 03 03 2AFA       1210        CLC   3(4,XR2),SSWID      IS IT A SSW CARD?
1723 F2 01 0F            1211        JNE   NSSW                JUMP IF NOT
1726 38 0F 2AA0          1212        TBN   DCPFG,X'0F'         IF REP-ING DCP, THEN ADD IT TO
172A F2 90 2F            1213        JF    CONTF3              SPECIAL RECORD
172D 3C 04 2BBF          1214        MVI   DDCFSM,4
1731 C0 87 131D          1215        B     DCPCD1+4
                         1216
1735 BD D9 00           1217 NSSW   CLI   0(,XR2),C'R'        IS IT A REP CARD?
1738 C0 01 1950          1218        BNE   INVCD1              CONVERT REP CARD TO TEXT CARD
173C BD 40 01            1219        CLI   1(,XR2),C' '        COLUMN 2 BLANK?
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 173F C0 01 1850          1220         BNE   INVCD1              IF NOT, GO TO INVALID CARD
 1743 BD 40 06            1221         CLI   6(,XR2),C' '        COLUMN 6 BLANK?
 1746 C0 01 1850          1222         BNE   INVCD1              IF NOT GO TO INVALID CARD
                          1223
 174A BD 40 02            1224         CLI   2(,XR2),C' '        IF COL'S. 3 OR 8 ARE BLANK,
 174D C0 81 1850          1225         BE    INVCD1              THEN IT IS AN INVALID CARD
 1751 BD 40 07            1226         CLI   7(,XR2),C' '
 1754 C0 81 1850          1227         BE    INVCD1
                          1228
 1758 C0 87 202E          1229         B     CONVRT              CONVERT REP CARD TO TEXT CARD
 175C 6C 5F 5F 5F         1230 CONTF3  MVC   95(96,XR1),95(,XR2)  MOVE IN CARD IMAGE
                          1231
 1760 0E 00 2BCD 0A03     1232         ALC   WRTW(1),ONE         INCREMENT WRITE#
 1766 36 01 2B77          1233         A     X256,XR1            INCREMENT TO NEXT REC'D
 176A C0 87 2A2F          1234         B     PRINT1              PRINT MSG
 176E 06            176E  1235         DC    XL1'06'             FLAG
 176F 27            176F  1236         DC    AL1(REPWH1-MENU5C)  LENGTH
 1770 3644          1771  1237         DC    AL2(REPWH1)         MSG 'ENTER NEXT REP'
 1772 C0 87 1707          1238         B     RTRN3A              READ ANOTHER RECORD
                          1239
                          1239
                          1239
                          1240 ********************************************************************
                          1241 *       PUT IN END CARD AND UPDATE VTOC                            *
                          1242 ********************************************************************
                          1243
                          1243
 1776 7C C5 00            1244 ENDRP   MVI   0(,XR1),C'E'          CREATE END RECORD
 1779 4C 7F FF 3726       1245         MVC   MSGBGN+LENGTH-ENDROU(LENGTH-ENDROU,XR1),LENGTH-1
 177E 0E 01 2B98 2BCD     1246         ALC   VTIMB+21(2),WRT#      UPDATE # OF VTOC ENTRIES
                          1247
                          1248 *       MOVE IN END CARD ROUTINE FOR DCP
 1784 C0 87 239C          1249         B     WINRW               WRITE END RECORD ON DISK
 1788 40            1788  1250         DC    XL1'40'             WRITE FLAG
 1789 4800          178A  1251         DC    AL2(DDDF)
 178B 2BC4          178C  1252         DC    AL2(DDCFTB)
                          1253
 178D C0 87 219B          1254         B     STPFLD              INCREMENT WRITE DDCF
 1791 2BC9          1792  1255         DC    AL2(DDCFTM)
                          1256
 1793 3D 0F 2AA0          1257         CLI   DCPFG,X'0F'         IS DCP FLAG SET?
 1797 F2 01 02            1258         JNE   RPCNT5              JUMP IF NOT
 179A 3C 00 2BAF          1259         MVI   DDCF,0              SET TO WRITE ONE RECORD
 179E 3C 00 2AA0          1260         MVI   DCPFG,0             RESET DCP FLAG
 17A2 F2 87 58            1261         J     RPCNT6              GO WRITE VTOC RECORD
                          1262
 17A5 0E 01 2272 0A03     1263 RPCNT5  ALC   FASINF(2),ONE
 17AB 0C 04 2B91 226F     1264         MVC   VTIMB+14(5),FASINB+8  UPDATE ADDRESS OF FIRST ENTRY
 17B1 0C 04 226F 2BC9     1265         MVC   FASINB+8(5),DDCFTM    UPDATE NEXT AVAIL ADDR IN FAS
 17B7 C0 87 2242          1266         B     WRFAS               WRITE FAS SECTOR
                          1267
 17EB 0C 02 17C8 345B     1268 RPCNT7  MVC   PRGID1(3),REPWHO      SCAN FOR OLD VTOC ENTRY
 17C1 C0 87 227A          1269         B     SCNVTC              TO SCAN VTOC SUBRT
 17C5 00            17C5  1270 FLAG1   DC    IL1'0'
 17C6 404040        17C8  1271 PRGID1  DC    CL3' '              ID OF PROGRAM TO SCAN FOR
 17C9 0C 04 30F6 4808     1272         MVC   ADMSG+12(5),DDDF+8    MOVE IN ID AND LEVEL INTO PRINT FLD
 17CF 3D 00 17C5          1273         CLI   FLAG1,0             IF FLAG =0 THEN PROGRAM NOT FOUND
 17D3 F2 81 4A            1274         JE    PGNTF
 17D6 0C 02 4806 2B01     1275         MVC   DDDF+6(3),OLD       OVERWRITE VTOC ENTRY WITH 'OLD'
                          1276
 17DC 3C 00 2BAF          1277         MVI   DDCF,0              ZERO NN FIELD
 17E0 C0 87 239C          1278         B     WINRW               WRITE OLD VTOC ENTRY
 17E4 40            17E4  1279         DC    XL1'40'             WRITE FLAG
 17E5 4800          17E6  1280         DC    AL2(DDDF)           @ OF DDDF
 17E7 2BA6          17E8  1281         DC    AL2(DDCFB)          @ OF DDCF
                          1282
 17E9 38 0F 2BF0          1283         TBN   DELFG,X'0F'         IS THIS $DEL PROGRAM?
 17ED C0 10 15E1          1284         BT    DEL1                IF SO, RETURN TO DELETE OPTION
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          1285
 17F1 C0 87 227A          1286         B     SCNVTC              GO TO END OF VTOC RECORD
 17F5 00            17F5  1287         DC    XL1'0'              FLAG (NOT USED)
 17F6 5C5C5C        17F8  1288         DC    CL3'***'            SPECIAL CHARACTER SIGNALLING GO TO
                          1289 *                                   END OF VTOC
 17F9 3C 01 2BAF          1290         MVI   DDCF,1              SET NN FIELD TO WRITE TWO RECORDS
                          1291
 17FD C0 87 0878          1292 RPCNT6  B     SETTO               SET FIELD TO X'00'
 1801 0C FF 49FF 48FF     1293         MVC   DDDF+255(256),DDDF+255   ZERO OUT SECOND WRITE FIELD
 1807 0C 1C 481C 2B9F     1294         MVC   DDDF+28(29),VTIM    SET UP VTOC RECORD
 180D 0C 5F 48DF 0A74     1295         MVC   DDDF+223(96),SAVID
                          1296
 1813 C0 87 239C          1297         B     WINRW               WRITE NEW VTOC
 1817 40            1817  1298         DC    XL1'40'             WRITE FLAG
 1818 4800          1819  1299         DC    AL2(DDDF)
 181A 2BA6          181B  1300         DC    AL2(DDCFB)
                          1301
 181C C0 87 0BCB          1302         B     EDITAA              RETURN TO MAIN OPTION MENU
                          1303
                          1303
                          1303
                          1304 ********************************************************************
                          1305 *       HANDLE PROGRAM NOT FOUND, X ENTRY, AND INVALID CARD        *
                          1306 ********************************************************************
                          1307
 1820 0C 02 31A7 1669     1308 PGNTF   MVC   MSG02-12(3),PRGID     MOVE IN ID OF PROGRAM NOT FOUND
 1826 C0 87 021A          1309         B     PRINT               PRINT 'PROGRAM NOT FOUND'
 182A 06            182A  1310         DC    XL1'06'             FLAG
 182B 17            182B  1311         DC    IL1'23'             LENGTH
 182C 31B3          182D  1312         DC    AL2(MSG02)
                          1313
 182E 38 0F 2BF0          1314         TBN   DELFG,X'0F'         IS IT IN THE DELETE MODE?
 1832 C0 10 1601          1315         BT    DEL2                IF YES, THEN CHECK IF ANOTHER
                          1316 *                                   PROGRAM TO DELETE
 1836 C0 87 0BCB          1317         B     EDITAA
                          1318
                          1318
 183A 3C 00 2BCD          1319 XHANDL  MVI   WRT#,0              ONLY WRITE THE END CARD
 183E C2 01 4800          1320         LA    DDDF,XR1            LOAD XR1
 1842 C0 87 0B8A          1321         B     SETO                SET DDDF TO 0
 1846 0C 04 2BC9 2BD4     1322         MVC   DDCFTM(5),XLOC      LOAD DDCF FIELD WITH NEXT SECTOR
 184C C0 87 1776          1323         B     ENDRP
                          1324
 1850 C0 87 2A2F          1325 INVCD1  B     PRINT1              DISPLAY INVALID CARD ENTERED
 1854 06            1854  1326         DC    XL1'06'             FLAG
 1855 26            1855  1327         DC    AL1(ERMS7-ERMS7B)   MESSAGE LENGTH
 1856 2E98          1857  1328         DC    AL2(ERMS7)
                          1329
 1858 38 F0 27F5          1330         TBN   USECRT,X'F0'        IF 5471 IN USE THEN DON'T PRINT
 185C F2 10 14            1331         JT    BB1                 MESSAGE
                          1332
 185F C0 87 021A          1333         B     PRINT               PRINT INVALID CARD IN $REP
 1863 C2            1863  1334         DC    XL1'C2'             FLAG
 1864 22            1864  1335         DC    AL1(ERR5-ERR5B)     LENGTH
 1865 2EEA          1866  1336         DC    AL2(CARD)           MESSAGE ADDRESS
 1867 FFE5          1868  1337         DC    XL2'FFE5'           ID
                          1338
 1869 C0 87 2A77          1339         B     PRINT2              PRINT RECORD IMAGE
                          1340
 186D C0 87 0222          1341         B     HALT                TO DCP HALT RTN
 1871 FFE5          1872  1342         DC    XL2'FFE5'           ID
                          1343
 1873 C0 87 1707          1344 BB1     B     RTRN3A              GO READ A RECORD
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                        1346 ********************************************************************************
                        1347 ********************************************************************************
                        1348 **      $DUP                                                              **
                        1349 **              THIS OPTION DUP'S THE CONTENTS OF A 3340 CE DATA          **
                        1350 **              MODULE ONTO ANOTHER INITIALIZED DATA MODULE.               **
                        1351 **                                                                        **
                        1352 ********************************************************************************
                        1353 ********************************************************************************
                        1354
                        1355 DSKDUP MVI   ICTR,2                  RESET COUNTER
                        1356
1877 3C 02 2BEA         1357 LOOP10 MVC   FRDRV#(1),TODRV#       MOVE CONTENTS TO CORRECT PLACE
1878 0C 00 2BEE 2BEF    1358        MVI   TODRV#,0                CLEAR FIELD
1881 3C 00 2BEF         1359        CLI   5(,XR2),C'D'            IS FIRST CHARACTER A D?
1885 BD C4 05           1360        BNE   DUPERR
1888 C0 01 19B5         1361        CLI   6(,XR2),C'1'            IS IT DRIVE 1?
188C BD F1 06           1362        JNE   *+7                     SKIP IF NOT
188F F2 01 04           1363        MVI   TODRV#,DR1              SET FIELD
1892 3C C0 2BEF         1364        CLI   6(,XR2),C'2'            IS IT DRIVE 2?
1896 BD F2 06           1365        BNE   TEST1                   IF NOT PRINT ERROR
1899 C0 01 18B5         1366        MVI   TODRV#,DR2              SET FIELD
189D 3C C8 2BEF         1367        CLI   6(,XR2),C'3'            IS IT DRIVE 3?
18A1 BD F3 06           1368        JNE   *+7                     SKIP IF NOT
18A4 F2 01 04           1369        MVI   TODRV#,DR3              SET FIELD
18A7 3C D0 2BEF         1370        CLI   6(,XR2),C'4'            IS IT DRIVE 4?
18AB BD F4 06           1371        JNE   *+7                     SKIP IF NOT
18AE F2 01 04           1372        MVI   TODRV#,DR4
18B1 3C D8 2BEF         1373 TEST1  CLI   TODRV#,0                HAS IT BEEN SET?
18B5 3D 00 2BEF         1374        BE    DUPERR                  IF NOT GO PRINT ERROR
18B9 C0 81 19B5         1375
                        1375
                        1375
                        1376        SLC   ICTR(1),ONE             HAVE WE GONE THROUGH THE LOOP TWICE?
18BD 0F 00 2BEA 0A03    1377        JZ    DUPROC                  THEN CONTINUE PROCESS
18C3 F2 81 0C           1378        MVC   4(2,XR2),6(,XR2)        SAVE DRIVE #
18C6 AC 01 04 06        1379        MVC   6(2,XR2),8(,XR2)        PUT IN NEXT DRIVE # TO BE COMPARED
18CA AC 01 06 08        1380        B     LOOP10                  RETURN TO DETERMINE DRIVE #
18CE C0 87 187B         1381
                        1381
18D2 0D 00 2BEF 2BEE    1382 DUPROC CLC   TODRV#(1),FRDRV#       ARE FROM AND TO FIELDS EQUAL?
18D8 F2 81 DA           1383        JE    DUPERR
18D8 3C 00 1B32         1384        MVI   NOT12,0                 RESET FLAG NOT 12 M BYTE FLAG
18DF 0C 00 234E 2BEE    1385        MVC   DRIVE#(1),FRDRV#        CHECK SIZE OF FROM DATA MODULE
18E5 2C 00 2F9A 04      1386        MVC   SZERRC(1),4(,XR2)
18EA C0 87 25E2         1387        B     SNS24                   DIAGNOSTIC READ ROUTINE
18EE 39 03 0B62         1388        TBF   DBYTE2,X'03'            JUMP IF NOT 12 M BYTE
18F2 C0 90 1B37         1389        BF    SIZER+4
                        1390
18F6 0C 00 234E 2BEF    1391        MVC   DRIVE#(1),TODRV#        CHECK SIZE OF TO DATA MODULE
18FC 2C 00 2F9A 06      1392        MVC   SZERRC(1),6(,XR2)
1901 C0 87 25E2         1393        B     SNS24                   DIAGNOSTIC READ ROUTINE
1905 39 03 0B62         1394        TBF   DBYTE2,X'03'            IF BITS NOT OFF GO TO ERROR
1909 C0 90 1B33         1395        BF    SIZER
1900 0C 03 213F 2B47    1396        MVC   STPSCT(4),C4HOR1-1      DUP OUT TO CYL 4 HEAD 0
1913 0C 03 213B 2B56    1397        MVC   STRSCT(4),COH027-1      SET SECTOR TO START DUPPING AT
1919 C0 87 2140         1398        B     RDWRT                   GO DO THE DUP IN 'STPSCT'
                        1399
191D C0 87 2201         1400        B     RDFAS                   READ FAS TO SEE HOW FAR TO DUP
1921 3C 30 226F         1401        MVI   FASINB+8,48             SET UP RECORD FIELD SO HEAD IS
                        1402 *                                    ALWAYS INCREMENTED
1925 C0 87 219B         1403        B     STPFLD                  INCREMENT TO NEXT HEAD
1929 226F        192A   1404        DC    AL2(FASINB+8)           RIGHT END ADDRESS
                        1405
1928 0C 03 213B 2B47    1406        MVC   STRSCT(4),C4HOR1-1      SET SECTOR TO START DUPPING AT
1931 0C 03 213F 226E    1407        MVC   STPSCT(4),FASINB+7      SET 'STPSCT' TO LAST TRACK DUP'ED
1937 C0 87 2140         1408        B     RDWRT                   GO DUP IT
                        1409
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

193B 3C 00 2397          1410        MVI   OUTREC+2,0              ZERO OUT CYL SEC OF ALT TRACK FLD
                         1411 *
                         1412 *              SEE IF CYLINDER 0 HEAD 2 IS DEFECTIVE: SEE WHAT
                         1413 *              IS IN OUTREC AFTER READ OF 1 RECORD
                         1414 *
193F 0C 04 2BAB 2B5C     1415        MVC   DDCFM(5),COH2R1
1945 3C 00 2BAF          1416        MVI   DDCF,0
1949 C0 87 239C          1417        B     WINRW
194D 80                  1418        DC    XL1'80'
194E 4800                1419        DC    AL2(DDDF)
1950 23A6                1420        DC    AL2(DDCFB)
                         1421 *
                         1422 *              NOW READ IN THE RECORD TO BE MODIFIED
                         1423 *
1952 0C 04 2BAB 2B57     1424        MVC   DDCFM(5),COH027         SET UP ADDRESS TO READ
1958 3C 00 2BAF          1425        MVI   DDCF,0                  READ 1 RECORD
195C C0 87 239C          1426        B     WINRW                   READ A RECORD
1960 80                  1427        DC    XL1'80'
1961 4800                1428        DC    AL2(DDDF)
1963 2BA6                1429        DC    AL2(DDCFB)
                         1430
1965 3D 00 2397          1431        CLI   OUTREC+2,0              SEE IF SUBRT SEEKED TO ALT TRACK
1969 C0 01 19C3          1432        BNE   CALCAD
196D 3C 01 4820          1433        MVI   DDDF+32,1               SET ADDRESSES IN UCODE TO NORMAL
1971 3C 00 4822          1434        MVI   DDDF+34,0               FOR 12 M BYTE
1975 3D 00 1B32          1435        CLI   NOT12,0                 DON'T OVERLAY FOR 70 M BYTE IF
1979 F2 81 08            1436        JE    WRTREC                  FLAG OFF
197C 3C 00 4820          1437        MVI   DDDF+32,0               SET ADDRESSES IN UCODE TO NORMAL
1980 3C 04 4822          1438        MVI   DDDF+34,4               FOR 70 M BYTE
                         1439
1984 3C 00 2BAF          1440 WRTREC MVI   DDCF,0                  WRITE 1 RECORD
1988 C0 87 239C          1441        B     WINRW
198C 40                  1442        DC    XL1'40'
198D 4800                1443        DC    AL2(DDDF)
198F 2BA6                1444        DC    AL2(DDCFB)
                         1445 *
                         1446 *              WRITE RECORDS ON CYL 0, HD 0, REC'S 25-29 AT
                         1447 *              CYL 0, HD 0 REC'S 33-37.
                         1448 *
1991 0C 03 20C6 2B56     1449        MVC   PNAS-1(4),COH027-1      SET UP SUBRT PARAMETERS
1997 0C 03 2BA4 20C6     1450        MVC   NAS-1(4),PNAS-1
199D 3C 05 2BCF          1451        MVI   SECT#,5
19A1 3C 19 20C7          1452        MVI   PNAS,25
19A5 3C 21 2BA5          1453        MVI   NAS,33
19A9 C0 87 20C8          1454        B     RWRTN                   TO WRITE SUBROUTINE
                         1455
19AD C0 87 234F          1456        B     SELDRV                  SET DRIVE# VIA SSW'S
19B1 C0 87 0BCB          1457        B     EDITAA                  RETURN TO MAIN OPTION MENU
                         1458
                         1458
19B5 C0 87 021A          1459 DUPERR B     PRINT                   PRINT 'INVLD CHARACTERS IN DUP FLD'
19B9 C6                  1460        DC    XL1'C6'                 FLAG
19BA 30                  1461        DC    AL1(ERR9-ERR9B)         LENGTH
19BB 2DB6                1462        DC    AL2(ERR9)               MESSAGE ADDRESS
19BD FFE9                1463        DC    XL2'FFE9'               ID
                         1464
19BF C0 87 0BCB          1465        B     EDITAA                  RETURN TO MAIN OPTION MENU
                         1466 *
                         1467 *              FIRST CALCULATE 3340 LOGICAL FROM SYS/3 LOGICAL
                         1468 *                                    IF IT IS 12 M BYTE PACK THEN JUMP
19C3 3D 00 1B32          1469 CALCAD CLI   NOT12,0
19C7 F2 81 BD            1470        JE    CAL12
19CA 0C 01 2AB6 2B47     1471        MVC   WORK(2),ZERO
19D0 0C 01 2AB8 2397     1472        MVC   CL3(2),OUTREC+2         GET SYS/3 LOGICAL CYL
19D6 0C 01 2ABA 2399     1473        MVC   HL3(2),OUTREC+4         GET SYS/3 LOGICAL HEAD
19DC 3C 28 2AC6          1474        MVI   COUNT,40
19E0 0E 01 2AB6 2AB8     1475 MULT40 ALC   WORK(2),CL3             MULTIPLY CL3 BY 40
19E6 0F 00 2AC6 0A03     1476        SLC   COUNT(1),ONE
```

```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT
   19EC  C0 01 19E0          1477         BNZ   MULT40
                             1478
   19F0  0E 01 2AB6 2ABA     1479         ALC   WORK(2),HL3          NOW ADD 2(HL3) TO CL3
   19F6  0E 01 2AB6 2ABA     1480         ALC   WORK(2),HL3
                             1481 *
                             1482 *       DIVIDE ABOVE BY 12
                             1483 *
   19FC  0C 01 2AC6 2B47     1484         MVC   COUNT(2),ZERO
   1A02  0D 01 2AB6 2BE3     1485         CLC   WORK(2),X12          IF LESS THAN 12, DON'T DIVIDE
   1A08  F2 02 03            1486         JNL   DIV12
   1A0B  F2 87 16            1487         J     SKD12
   1A0E  0F 01 2AB6 2BE3     1488 DIV12   SLC   WORK(2),X12
   1A14  0E 01 2AC6 0A03     1489         ALC   COUNT(2),ONE
   1A1A  0D 01 2AB6 2BE3     1490         CLC   WORK(2),X12
   1A20  C0 02 1A0E          1491         BNL   DIV12
   1A24  0C 01 2ABC 2AC6     1492 SKD12   MVC   CLW(2),COUNT         INTEGER PART IS 3340 LOGICAL CYL
   1A2A  0C 01 2ABE 2AB6     1493         MVC   HLW(2),WORK          REMAINDER IS 3340 LOGICAL HEAD
                             1494 *
                             1495 *       NOW CALCULATE 3340 PHYSICAL FROM 3340 LOGICAL
                             1496 *
                             1497 *       FIRST, DIVIDE CLW BY 2
   1A30  0C 01 2AC6 2B47     1498         MVC   COUNT(2),ZERO
   1A36  0C 01 2AB6 2ABC     1499         MVC   WORK(2),CLW
   1A3C  0D 01 2AB6 2BD7     1500         CLC   WORK(2),X2           IF LESS THAN 2 DON'T DIVIDE
   1A42  F2 02 03            1501         JNL   DIV02
   1A45  F2 87 16            1502         J     SKD02
   1A48  0F 01 2AB6 2BD7     1503 DIV02   SLC   WORK(2),X2
   1A4E  0E 01 2AC6 0A03     1504         ALC   COUNT(2),ONE
   1A54  0D 01 2AB6 2BD7     1505         CLC   WORK(2),X2
   1A5A  C0 02 1A48          1506         BNL   DIV02
                             1507
   1A5E  0C 01 2AC0 2AC6     1508 SKD02   MVC   CPW(2),COUNT          3340 PHYSICAL CYL IS INTEGER
                             1509 *                                   PART OF ABOVE CALCULATION
                             1510 *
                             1511 *       REMAINDER OF ABOVE CALCULATION IS NOW MULTIPLIED BY 12
                             1512 *
   1A64  3C 0C 2AC6          1513         MVI   COUNT,12
   1A68  0C 01 2AC2 2B47     1514         MVC   HPW(2),ZERO
   1A6E  0E 01 2AC2 2AB6     1515 MULT12  ALC   HPW(2),WORK
   1A74  0F 00 2AC6 0A03     1516         SLC   COUNT(1),ONE
   1A7A  C0 01 1A6E          1517         BNZ   MULT12
                             1518 *
                             1519 *       ADD HLW TO ABOVE TO GET 3340 PHYSICAL HEAD VALUE
                             1520 *
   1A7E  0E 01 2AC2 2ABE     1521         ALC   HPW(2),HLW
   1A84  F2 87 69            1522         J     FINCAL
                             1523 *
                             1524 *       FOLLOWING IS USED TO CALCULATE PHYSICAL HEAD AND CYL
                             1525 *       FOR 12 MBYTE CE DATA MODULES
                             1526 *
                       1A87  1527 CAL12   EQU   *
   1A87  0C 01 2AB6 2B47     1528         MVC   WORK(2),ZERO
   1A8D  0C 01 2AB8 2397     1529         MVC   CL3(2),OUTREC+2      GET SYS/3 LOGICAL CYL
   1A93  0C 01 2ABA 2399     1530         MVC   HL3(2),OUTREC+4      GET SYS/3 LOGICLA HEAD
   1A99  3C 0A 2AC6          1531         MVI   COUNT,10
   1A9D  0E 01 2AB6 2AB8     1532 MULT10  ALC   WORK(2),CL3          MULTIPLY BY 10
   1AA3  0F 00 2AC6 0A03     1533         SLC   COUNT(1),ONE
   1AA9  C0 01 1A9D          1534         BNZ   MULT10
                             1535 *
                             1536 *       DIVIDE SYS/3 LOGICAL HEAD VALUE BY 2
                             1537 *
   1AAD  0C 01 2AC6 2B47     1538         MVC   COUNT(2),ZERO
   1AB3  0D 01 2ABA 2BD7     1539         CLC   HL3(2),X2
   1AB9  F2 02 03            1540         JNL   DV02
   1ABC  F2 87 16            1541         J     SKDV02
   1ABF  0F 01 2ABA 2BD7     1542 DV02    SLC   HL3(2),X2
   1AC5  0E 01 2AC6 0A03     1543         ALC   COUNT(2),ONE
   1ACB  0D 01 2ABA 2BD7     1544         CLC   HL3(2),X2
```



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ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT
   1AD1  C0 02 1ABF          1545         BNL   DV02
   1AD5  0E 01 2AB6 2AC6     1546 SKDV02  ALC   WORK(2),COUNT         ADD QUOTIENT TO CL3*10
   1AD8  0C 01 2AC0 2AB6     1547         MVC   CPW(2),WORK           SAVE 3340 PHYSICAL CYLINDER
                             1548 *
                             1549 *       IF REMAINDER OF ABOVE DIVISION IS 0, HPW = 0;
                             1550 *       IF REMAINDER IS 1, HPW = 2.
                             1551 *
   1AE1  3C 00 2AC2          1552         MVI   HPW,0
   1AE5  3D 00 2ABA          1553         CLI   HL3,0
   1AE9  F2 81 04            1554         JE    *+7
   1AEC  3C 02 2AC2          1555         MVI   HPW,2
                             1556 *
                             1557 *       HOW CYLINDER VALUE MUST BE CONVERTED TO ONE BYTE FORMAT
                             1558 *       FORMAT IS AS FOLLOWS:
                             1559 *
                             1560 *       CARSAV---CONTAINS CYLINDERS 00-FF
                             1561 *       HARSAV--BITS  0   1   2   3   4   5   6   7
                             1562 *                     0   1   0   |<-HEAD VALUES->|
                             1563 *
                             1564 *                   BITS 0 AND 2 ARE ALWAYS 0
                             1565 *                   BIT 1 IS 1 ONLY WHEN CYL IS GREATER THAN X'FF'
   1AF0  0C 00 2AB3 2AC0     1566 FINCAL  MVC   CARSAV(1),CPW
   1AF6  3B 40 2AB4          1567         SBF   HARSAV,X'40'
   1AFA  0D 01 2AC0 2AC4     1568         CLC   CPW(2),CKER           IS CYL GREATER THAN X'00FF'
   1B00  F2 84 03            1569         JH    HERE
   1B03  F2 87 04            1570         J     *+7
   1B06  3A 40 2AB4          1571 HERE    SBN   HARSAV,X'40'          IF SO, SET BIT 1 ON
                             1572
   1B0A  08 03 2AB4 2AC2     1573         NNN   HARSAV,HPW
   1B10  3B 10 2AB4          1574         SBF   HARSAV,X'10'
   1B14  3D 0F 2AC2          1575         CLI   HPW,X'0F'             IS 3340 HD GREATER THAN 'OF' ?
   1B18  F2 84 03            1576         JH    HERE1
   1B1B  F2 87 04            1577         J     *+7
   1B1E  3A 10 2AB4          1578 HERE1   SBN   HARSAV,X'10'          IF SO, SET BIT 3 ON
                             1579
   1B22  0C 00 4820 2AB3     1580         MVC   DDDF+32(1),CARSAV     UPDATE MICROCODE WITH ALT CYL
   1B28  0C 00 4822 2AB4     1581         MVC   DDDF+34(1),HARSAV        AND HEAD
   1B2E  C0 87 1984          1582         B     WRTREC                GO WRITE THE RECORD ON DATA MODULE
                             1583 *
                             1584 *
                             1585 *       ROUTINE HANDLING WRONG DATA MODULE SIZE
                             1586 *
   1B32  00                  1587 NOT12   DC    XL1'0'
   1B33  3C FF 1B32          1588 SIZER   MVI   NOT12,X'FF'
   1B37  34 08 1B4E          1589         ST    SIZERR+3,ARR          STORE RETURN ADDRESS
   1B3B  C0 87 021A          1590         B     PRINT                 PRINT 'DATA MODULE SIZE NOT 12 ...'
   1B3F  C6                  1591         DC    XL1'C6'
   1B40  59                  1592         DC    AL1(SZERR-SZERRB)
   1B41  2FDD                1593         DC    AL2(SZERR)
   1B43  FFEF                1594         DC    XL2'FFEF'
                             1595
   1B45  C0 87 0222          1596         B     HALT                  HALT  -EF-
   1B49  FFEF                1597         DC    XL2'FFEF'
   1B4B  C0 87 0000          1598 SIZERR  B     *-*
                             1599
                             1599
                             1599
                             1599
                             1599
                             1599
                             1599
                             1600 ********************************************************************************
                             1601 ********************************************************************************
                             1602 **      $LST                                                                  **
                             1603 **            THIS OPTION LISTS THE PROGRAMS ON THE 3340 CE                   **
                             1604 **            DATA MODULE.                                                    **
                             1605 **                                                                            **
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1606 ********************************************************************************
                         1607 ********************************************************************************
                         1608
                         1608
                    1B4F 1609 LSTPGM EQU   *
 1B4F 38 02 0A0F         1610        TBN   X5203,X'02'          IS PRINTER 132 PRINT POSITION
 1B53 F2 10 17           1611        JT    LSPGM1               JUMP IF YES
 1B56 38 20 0A11         1612        TBN   X1403-1,X'20'        IS IT THE 1403 PRINTER
 1B5A F2 10 10           1613        JT    LSPGM1               JUMP IF YES
 1B5D 3C 01 1B9C         1614        MVI   LOP12A+1,X'01'       SET COUNTER TO 1 IF NOT
 1B61 3C 01 1BDB         1615        MVI   LSCNT2+1,X'01'       SET COUNT TO 1
 1B65 3C 40 1B7C         1616        MVI   LSPG1A+1,X'40'       SET TO BLANK
 1B69 3C 40 1B80         1617        MVI   LSPG1B+1,X'40'       SET TO BLANK
 1B6D 3C 40 0A93         1618 LSPGM1 MVI   PRTBF+126,C' '       BLANK OUT PRINT
 1B71 0C 7D 0A92 0A93    1619        MVC   PRTBF+125(126),PRTBF+126          BUFFER
 1B77 3C 60 0A18         1620        MVI   PRTBF+3,C'-'         INSERT
 1B7B 3C 60 0A5A         1621 LSPG1A MVI   PRTBF+69,C'-'                DASHES
                         1622 *      MVC   PRTBF+64(3),AST      INSERT DIVIDER
 1B7F 3C 4B 0A54         1623 LSPG1B MVI   PRTBF+63,C'.'
                         1624
 1B83 3C 01 2BED         1625        MVI   MCTR,1               USE NEW DDCF FIELD IN SUBRT 'LSTRD'
 1B87 04 02 2ACA 2AE4    1626        ZAZ   TEMP5(3),MAXPGM(3)   SET TEMP VTOC# TO MAX # OF ENTRIES
 1B8D 0C 04 2BAB 2B4D    1627        MVC   DDCFM(5),C2HOR1      SET DDCF TO READ VTOC
 1B93 3C 02 2BEC         1628 LSPGM2 MVI   KCTR,2               INITIALIZE COUNTER
                         1629
 1B97 C2 02 0A15         1630 LOOP12 LA    PRTBF,XR2            INITIALIZE ADDRESS POINTER
 1B9B 3C 02 2BEB         1631 LOP12A MVI   LCTR,2               INITIALIZE COUNTER
                         1632
 1B9F C0 87 1C35         1633 LSCNT1 B     LSTRD                READ NEXT RECORD IN VTOC
 1BA3 4D 02 02 2B7F      1634        CLC   2(3,XR1),ACTO-1      ARE COL'S 1-3 'ACT'?
 1BA8 F2 01 2F           1635        JNE   LSCNT2               IF NOT, QUIT LISTING PROGRAMS
                         1636
 1BAB 07 20 2ACA 2ADB    1637        SZ    TEMP5(3),D1(1)       DECREMENT # OF VTOC ENTRIES LEFT
                         1638
 1BB1 4D 02 06 2B01      1639        CLC   6(3,XR1),OLD         IS IT AN OLD ENTRY?
 1BB6 C0 81 1B9F         1640        BE    LSCNT1               READ ANOTHER ENTRY IF IT IS
                         1641
 1BBA 9C 02 02 06        1642        MVC   2(3,XR2),6(,XR1)     PUT IN ID FIELD
 1BBE 9C 00 04 08        1643        MVC   4(1,XR2),8(,XR1)     PUT LEVEL INTO PRINT FIELD
 1BC2 9C 14 1A 9F        1644        MVC   26(21,XR2),159(,XR1) MOVE PN & EC INTO PRINT FIELD
 1BC6 9C 1F 3C BF        1645        MVC   60(32,XR2),191(,XR1)  MOVE COMMENT AREA INTO PRINT FIELD
                         1646
 1BCA 0F 00 2BEB 0A03    1647        SLC   LCTR(1),ONE          DECREMENT COUNTER
 1BD0 F2 81 1C           1648        JZ    LSCNT3               GO PRINT IF READ 2 RECORDS
 1BD3 E2 02 42           1649        LA    66(,XR2),XR2         INCREMENT XR2
 1BD6 C0 87 1B9F         1650        B     LSCNT1               READ 2ND RECORD
                         1651
 1BDA 3D 02 2BEB         1652 LSCNT2 CLI   LCTR,2               LCTR=2
 1BDE F2 81 22           1653        JE    LSTCON               THEN DON'T PRINT AT ALL
 1BE1 3C 40 0A93         1654        MVI   PRTBF+126,C' '       IF ONE RECORD HAS BEEN READ BEFORE
 1BE5 0C 3C 0A92 0A93    1655        MVC   PRTBF+125(61),PRTBF+126  REACHING END OF VTOC, THEN PRINT
 1BEB 3C 0F 2A9E         1656        MVI   LWRT,X'0F'           IT
                         1657
 1BEF C0 87 021A         1658 LSCNT3 B     PRINT                PRINT LIST FIELD
 1BF3 01            1BF3 1659        DC    XL1'01'              FLAG
 1BF4 7F            1BF4 1660        DC    IL1'127'             LENGTH
 1BF5 0A93          1BF6 1661        DC    AL2(PRTBF+126)       MESSAGE ADDRESS
                         1662
 1BF7 3D 0F 2A9E         1663        CLI   LWRT,X'0F'           IS THIS THE LAST RECORD?
 1BFB 3C 00 2A9E         1664        MVI   LWRT,0
 1BFF C0 01 1B97         1665        BNE   LOOP12               IF NOT, THEN READ SOME MORE
                         1666
 1C03 C0 87 021A         1667 LSTCON B     PRINT                SPACE 2 LINES
 1C07 1?            1C07 1668        DC    XL1'12'
                         1669
 1C08 38 02 2BEB         1670        TBN   LCTR,X'02'                                    02
 1C0C F2 10 04           1671        JT    *+7                                           02
 1C0F 3C 40 0A5A         1672        MVI   PRTBF+69,C' '                                 02
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1673
 1C13 0F 00 2BEC 0A03    1674        SLC   KCTR(1),ONE          IS THIS THE SECOND TIME?
 1C19 0C 02 2C17 2ACA    1675        MVC   VTOC1#(3),TEMP5      SAVE # OF VTOC ENTRIES LEFT
 1C1F C0 81 1D48         1676        BZ    STCNT                IF SO, THEN BRANCH
                         1677
 1C23 3C 01 2BED         1678        MVI   MCTR,1               FORCE SUBRT 'LSTRD' TO USE NEW DDCF
 1C27 0C 04 2BAB 2B2F    1679        MVC   DDCFM(5),C3H162      SET UP DDCF FOR FAS VTOC
 1C2D 3C 60 0A5A         1680        MVI   PRTBF+69,C'-'        INSERT DASH IN CASE IT WAS DESTROYED
 1C31 C0 87 1B97         1681        B     LOOP12               GO READ THE RECORDS
                         1682
                         1682
                         1682
                         1683 *
                         1684 *           SUBROUTINE TO READ 48 RECORDS OF VTOC AT A TIME AND
                         1685 *           ADJUST THE ADDRESS POINTER FOR THE MAIN PROGRAM
                         1686 *
                         1687
 1C35 34 08 1C49         1688 LSTRD  ST    LSTRDR+3,ARR         SAVE RETURN ADDRESS
 1C39 0F 00 2BED 0A03    1689        SLC   MCTR(1),ONE          DECREMENT COUNTER
 1C3F F2 81 08           1690        JZ    LSTRDR+4
 1C42 36 01 2B77         1691        A     X256,XR1             INCR XR1 IF NOT READING NEW TRACK
 1C46 C0 87 0000         1692 LSTRDR B     *-*                  RETURN TO CALLER
                         1693
 1C4A 3C 30 2BED         1694        MVI   MCTR,48              RESTORE COUNTER
 1C4E 3C 2F 2BAF         1695        MVI   DDCF,47              SET NN FIELD TO READ 48 RECORDS
 1C52 C2 01 4800         1696        LA    DDDF,XR1             REINITIALIZE XR1
                         1697
 1C56 C0 87 239C         1698        B     WINRW                READ 48 RECORDS OF VTOC
 1C5A 80            1C5A 1699        DC    XL1'80'              READ FLAG
 1C5B 4800          1C5C 1700        DC    AL2(DDDF)
 1C5D 2BA6          1C5E 1701        DC    AL2(DDCFB)
                         1702
 1C5F C0 87 219B         1703        B     STPFLD               INCREMENT DDCF
 1C63 2BAB          1C64 1704        DC    AL2(DDCFM)
 1C65 C0 87 1C46         1705        B     LSTRDR
                         1706
                         1706
                         1706
                         1706
                         1706
                         1706
                         1706
                         1707 ********************************************************************************
                         1708 ********************************************************************************
                         1709 **      $CMP                                                            **
                         1710 **           THIS OPTION REMOVES ALL 'OLD' ENTRIES FROM THE VTOC        **
                         1711 **           AND THEIR CORRESPONDING PROGRAM AREAS.                     **
                         1712 **                                                                      **
                         1713 ********************************************************************************
                         1714 ********************************************************************************
                         1715
                         1715
                         1716
                         1716
                    1C69 1717 CMPPGM EQU   *
 1C69 C2 01 4800         1718        LA    DDDF,XR1
 1C6D 0C 01 2AB0 2B47    1719        MVC   VTOC#(2),ZERO        PREPARE BUFFER FOR FAS SECTOR
 1C73 04 02 2C17 2AE4    1720        ZAZ   VTOC1#(3),MAXPGM(3)  PREPARE PRINT BUFFER
 1C79 0C 04 2BAB 2B4D    1721        MVC   DDCFM(5),C2HOR1      SET UP DDCF TO SCAN FOR FIRST
                         1722
 1C7F 3C 00 2BAF         1723 LOOP5  MVI   DDCF,0               OPERATE ON ONE RECORD
 1C83 C0 87 239C         1724        B     WINRW                READ A VTOC RECORD
 1C87 80            1C87 1725        DC    XL1'80'              READ FLAG
 1C88 4800          1C89 1726        DC    AL2(DDDF)
 1C8A 2BA6          1C8B 1727        DC    AL2(DDCFB)
                         1728
 1C8C 4D 02 06 2B01      1729        CLC   6(3,XR1),OLD         IS THIS AN 'OLD' ENTRY?
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1C91 F2 81 1E              1730         JE    CMCNT1              JUMP OUT OF SEARCH ROUTINE
                              1731
   1C94 4D 02 02 2B7F         1732         CLC   2(3,XR1),ACTO-1     IS THIS THE END OF THE VTOC?
   1C99 F2 01 AC              1733         JNE   STCNT               GO PRINT MESSAGE
                              1734
   1C9C 0E 01 2AB0 0A03       1735         ALC   VTOC#(2),ONE        INCREMENT VTOC COUNT
   1CA2 07 20 2C17 2ADE       1736         SZ    VTOC1#(3),D1(1)     DECREMENT PRINT BUFFER
                              1737
   1CA8 C0 87 219B            1738         B     STPFLD              STEP CONTROL FIELD
   1CAC 2BAB            1CAD  1739         DC    AL2(DDCFM)
                              1740
   1CAE C0 87 1C7F            1741         B     LOOP5               RETURN TO READ ANOTHER RECORD
                              1742
                              1742
   1CB2 1C 04 2BA5 0E         1743 CMCNT1  MVC   NAS(5),14(,XR1)      SET UP NEXT AVAILABLE SECTOR
   1CB7 0C 04 2BB5 2BAB       1744         MVC   DDCFRM(5),DDCFM       SET UP NAS IN VTOC
   1CBD 3C 00 2BB9            1745         MVI   DDCFR,0               INITIALIZE CONTROL FIELD
                              1746
   1CC1 C0 87 219B            1747 LOOP16  B     STPFLD              STEP CONTROL FIELD
   1CC5 2BB5            1CC6  1748         DC    AL2(DDCFRM)
                              1749
   1CC7 3C 00 2BB9            1750         MVI   DDCFR,0             OPERATE ON ONE RECORD
   1CCB C0 87 239C            1751         B     WINRW               READ NEXT ENTRY
   1CCF 80              1CCF  1752         DC    XL1'80'             READ FLAG
   1CD0 4800            1CD1  1753         DC    AL2(DDDF)
   1CD2 2BB0            1CD3  1754         DC    AL2(DDCFRB)
                              1755
   1CD4 4D 02 02 2B7F         1756         CLC   2(3,XR1),ACTO-1     REACHED THE END OF VTOC?
   1CD9 F2 01 45              1757         JNE   ENCMP1              IF SO PRINT MESSAGE
                              1758
   1CDC 4D 02 06 2B01         1759         CLC   6(3,XR1),OLD        IS IT AN 'OLD' ENTRY?
   1CE1 C0 81 1CC1            1760         BE    LOOP16              THEN GO READ ANOTHER RECORD
                              1761
   1CE5 1C 01 2BCF 15         1762         MVC   SECT#(2),21(,XR1)   STORE HOW MANY SECTORS TO MOVE
   1CEA 1C 04 20C7 0E         1763         MVC   PNAS(5),14(,XR1)    STORE WHERE TO FIND PROGRAM
   1CEF 4C 04 0E 2BA5         1764         MVC   14(5,XR1),NAS       MOVE IN NEW PROGRAM LOCATION ADDRESS
                              1765
   1CF4 3C 00 2BAF            1766         MVI   DDCF,0
   1CF8 C0 87 239C            1767         B     WINRW               WRITE VTOC ENTRY
   1CFC 40              1CFC  1768         DC    XL1'40'             WRITE FLAG
   1CFD 4800            1CFE  1769         DC    AL2(DDDF)
   1CFF 2BA6            1D00  1770         DC    AL2(DDCFB)
                              1771
   1D01 0E 01 2AB0 0A03       1772         ALC   VTOC#(2),ONE        INCREMENT NUMBER OF VTOC ENTRIES
   1D07 07 20 2C17 2ADB       1773         SZ    VTOC1#(3),D1(1)     DECREMENT PRINT BUFFER
                              1774
   1D0D C0 87 219B            1775         B     STPFLD              STEP VTOC LOCATION POINTER
   1D11 2BAB            1D12  1776         DC    AL2(DDCFM)
                              1777
   1D13 C0 87 20C8            1778         B     RWRTN               TO READ-WRITE RTN WHERE PROGRAM IS
                              1779 *                                 MOVED
   1D17 0C 04 2BA5 2BC9       1780         MVC   NAS(5),DDCFTM       UPDATE NEXT AVAILABLE SECTOR FIELD
   1D1D C0 87 1CC1            1781         B     LOOP16              RETURN
                              1782
                              1782
   1D21 3C 00 2BAF            1783 ENCMP1  MVI   DDCF,0             ZERO OUT RECORD BIYE
   1D25 C0 87 0B78            1784         B     SETTO               SET DDDF TO 0
   1D29 C0 87 239C            1785         B     WINRW               WRITE RECORD OF 0'S TO SIGNIFY EOR
   1D2D 40              1D2D  1786         DC    XL1'40'             WRITE FLAG
   1D2E 4800            1D2F  1787         DC    AL2(DDDF)
   1D30 2BA6            1D31  1788         DC    AL2(DDCFB)
                              1789
   1D32 0C 04 226F 2BA5       1790         MVC   FASINB+8(5),NAS     SET UP NEW FAS SECTOR
   1D38 0C 01 2272 2AB0       1791         MVC   FASINF(2),VTOC#
   1D3E 0C 02 2269 2269       1792         MVC   FASINB+2(3),FAS
   1D44 C0 87 2242            1793         B     WRFAS               WRITE NEW FAS SECTOR
                              1794
   1D48 C0 87 2201            1795 STCNT   B     RDFAS               READ FAS RECORD
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1D4C 04 40 2C3B 2AD4       1796         ZAZ   SPACE#(5),D0(1)     ZERO OUT # OF SECTORS LEFT BUFFER
                              1797
   1D52 3D 22 226C            1798 LOOP18  CLI   FASINM-3,34         IS CYL #= 343
   1D56 F2 02 32              1799         JNL   STP3                THEN QUIT AND PRINT
                              1800
   1D59 3D 01 226F            1801         CLI   FASINM,1            IS REC # = 1
   1D5D F2 81 10              1802         JE    CMCNT4              IF SO, THEN JUMP
   1D60 06 40 2C3B 2ADE       1803         AZ    SPACE#(5),D1(1)     INCREMENT # OF SECTS LEFT
                              1804
   1D66 C0 87 219B            1805         B     STPFLD              INCREMENT FIELD
   1D6A 226F            1D6B  1806         DC    AL2(FASINM)
                              1807
   1D6C C0 87 1D52            1808         B     LOOP18              DO IT AGAIN
                              1809
   1D70 3C 30 226F            1810 CMCNT4  MVI   FASINM,48           SET TO LAST RECORD
   1D74 06 31 2C3B 2ADE       1811         AZ    SPACE#(5),D48(2)    INCREMENT SECTORS LEFT BY 48
                              1812
   1D7A C0 87 219B            1813         B     STPFLD              INCREMENT FIELD
   1D7E 226F            1D7F  1814         DC    AL2(FASINM)
                              1815
   1D80 3D 22 226C            1816         CLI   FASINM-3,34         REACHED CYL 343
   1D84 F2 02 04              1817         JNL   STP3
   1D87 C0 87 1D70            1818         B     CMCNT4              DO IT AGAIN
                              1819
   1D8B C0 87 021A            1820 STP3    B     PRINT               PRINT 'XX VTOC ENTRIES LEFT ...'
   1D8F 06              1D8F  1821         DC    XL1'06'             FLAG
   1D90 4C              1D90  1822         DC    AL1(VMSG-VMSGB)     LENGTH
   1D91 2C44            1D92  1823         DC    AL2(VMSG)           MESSAGE ADDRESS
                              1824
   1D93 C0 87 0BCB            1825         B     EOITAA              RETURN TO  AIN OPTION MENU
                              1826
                              1826
                              1826
                              1826
                              1826
                              1826
                              1826
                              1827 ********************************************************************************
                              1828 ********************************************************************************
                              1829 **      $CONFIG                                                           **
                              1830 **            THIS OPTION ALLOWS NEW UDT,CPU, OR // CHAIN ENTRIES         **
                              1831 **            TO BE MADE TO THE DIAGNOSTIC CONTROL PROGRAM.               **
                              1832 **                                                                        **
                              1833 ********************************************************************************
                              1834 ********************************************************************************
                              1835
                        1D97  1836 CFGPGM  EQU   *
   1D97 3A 0F 2AAE            1837         SBN   CFIGFG,X'0F'        SET CONFIGURE FLAG
   1D9B C2 01 4800            1838         LA    DDDF,XR1            LOAD ADDRESS POINTER
                              1839
   1D9F 0C 03 20C6 2B52       1840         MVC   PNAS-1(4),C3H15     SET UP PARAMETERS FOR SUBROUTINE
   1DA5 0C 03 2BA4 2B52       1841         MVC   NAS-1(4),C3H15      RWRTN, TO MOVE DCP RECORDS TO
   1DAB 3C 01 20C7            1842         MVI   PNAS,1              TEMPORARY DISK LOCATION
   1DAF 3C 05 2BA5            1843         MVI   NAS,5
   1DB3 0C 01 2BCF 2BDB       1844         MVC   SECT#(2),X4
                              1845
   1DB9 C0 87 20C8            1846         B     RWRTN               MOVE RECORDS ON DISK
                              1847
   1DBD C0 87 2A2F            1848 CFRT    B     PRINT1              DISPLY 'CONFIGURE ENTRIES'
   1DC1 01              1DC1  1849         DC    XL1'01'             FLAG
   1DC2 26              1DC2  1850         DC    AL1(MENU2-MENU2B)   MESSAGE LENGTH
   1DC3 333F            1DC4  1851         DC    AL2(MENU2)          MESSAGE ADDRESS
   1DC5 C0 87 2A2F            1852         B     PRINT1              DISPLY 'CONFIGURE ENTRIES'
   1DC9 01              1DC9  1853         DC    XL1'01'             FLAG
   1DCA 28              1DCA  1854         DC    AL1(MEN22-MENU2C)   MESSAGE LENGTH
   1DCB 3367            1DCC  1855         DC    AL2(MEN22)          MESSAGE ADDRESS
```

DD62 3340 CE DISK EDITOR MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1DCD C0 87 2A2F          1856         B     PRINT1
   1DD1 01                  1857 1DD1    DC    XL1'01'
   1DD2 28                  1858 1DD2    DC    AL1(MEN23-MENU2D)
   1DD3 338F                1859 1DD4    DC    AL2(MEN23)
   1DD5 C0 87 2A2F          1860         B     PRINT1
   1DD9 01                  1861 1DD9    DC    XL1'01'
   1DDA 28                  1862 1DDA    DC    AL1(MEN24-MENU2E)
   1DDB 33B7                1863 1DDC    DC    AL2(MEN24)
   1DDD C0 87 2A2F          1864         B     PRINT1
   1DE1 01                  1865 1DE1    DC    XL1'01'
   1DE2 30                  1866 1DE2    DC    AL1(MEN25-MENU2F)
   1DE3 33E7                1867 1DE4    DC    AL2(MEN25)
   1DE5 C0 87 2A2F          1868         B     PRINT1
   1DE9 06                  1869 1DE9    DC    XL1'06'
   1DEA 28                  1870 1DEA    DC    AL1(MEN27-MENU2H)
   1DEB 340F                1871 1DEC    DC    AL2(MEN27)
                            1872
   1DED C0 87 2749          1873 CFRT3   B     RECORD
                            1874
   1DF1 BD E7 00            1875         CLI   0(,XR2),C'X'
   1DF4 C0 81 1F28          1876         BE    CFGEND
   1DF8 BD C5 00            1877         CLI   0(,XR2),C'E'
   1DFB C0 81 1F28          1878         BE    CFGEND
                            1879
   1DFF 8D 07 07 2AF6       1880         CLC   7(8,XR2),CHNID
   1E04 C0 81 1383          1881         BE    DCPCD2
   1E08 BD C3 00            1882         CLI   0(,XR2),C'C'
   1E0B C0 81 141D          1883         BE    DCPCD4
   1E0F BD E4 00            1884         CLI   0(,XR2),C'U'
   1E12 C0 01 1F30          1885         BNE   CFGERR
   1E16 BD 40 03            1886         CLI   3(,XR2),C' '
   1E19 C0 81 13F5          1887         BE    DCPCD3
                            1888
                            1888
                            1888
                            1888
                            1889 ********************************************************************************
                            1890 *            THIS SECTION HANDLES UDTX ENTRIES.                                *
                            1891 ********************************************************************************
                            1892
                            1892
   1E1D 34 01 1E38          1893 UDTXP   ST    TMADR1,XR1
   1E21 E2 02 03            1894         LA    3(,XR2),XR2
   1E24 0C 03 2BBE 2B52     1895         MVC   DDCFSM-1(4),C3H15
   1E2A 3C 06 2BBF          1896         MVI   DDCFSM,6
   1E2E 3C 00 2BC3          1897         MVI   DDCFS,0
                            1898
   1E32 C0 87 239C          1899         B     WINRW
   1E36 80                  1900 1E36    DC    XL1'80'
   1E37 0000                1901 1E38    DC    AL2(*-*)
   1E39 2BBA                1902 1E3A    DC    AL2(DDCFSB)
                            1903
   1E3B 35 01 1E38          1904 UDSCN   L     TMADR1,XR1
   1E3F D2 01 03            1905         LA    3(,XR1),XR1
   1E42 6D 01 02 02         1906 LOOP25  CLC   2(2,XR1),2(,XR2)
   1E46 F2 01 03            1907         JNE   UTCNT4
   1E49 7C E7 01            1908         MVI   1(,XR1),C'X'
   1E4C D2 01 01            1909 UTCNT4  LA    1(,XR1),XR1
   1E4F 7D 40 00            1910         CLI   0(,XR1),C' '
   1E52 F2 81 0B            1911         JE    LOOP21
   1E55 7D 6B 00            1912         CLI   0(,XR1),C','
   1E58 C0 P1 1E42          1913         BE    LOOP25
   1E5C C0 87 1E4C          1914         B     UTCNT4
                            1915
   1E60 E2 02 01            1916 LOOP21  LA    1(,XR2),XR2
   1E63 BD 40 00            1917         CLI   0(,XR2),C' '
   1E66 F2 81 0B            1918         JE    UTCNT1
   1E69 BD 6B 00            1919         CLI   0(,XR2),C','
```

DISPLY 'CONFIGURE ENTRIES'
FLAG
MESSAGE LENGTH
MESSAGE ADDRESS
DISPLY 'CONFIGURE ENTRIES'
FLAG
MESSAGE LENGTH
MESSAGE ADDRESS
DISPLY 'CONFIGURE ENTRIES'
FLAG
MESSAGE LENGTH
MESSAGE ADDRESS
DISPLY 'CONFIGURE ENTRIES'
FLAG
MESSAGE LENGTH
MESSAGE ADDRESS

GET ENTRY

IS IT AN X ENTRY
THEN RETURN TO MAIN OPTION MENU
IS IT AN E ENTRY
THEN RETURN TO MAIN OPTION MENU

IS IT A CHAIN REC'D?
IF SO, GO HANDLE IT
IS IT A CPU ENTRY?
IF SO, GO HANDLE IT
IS AN UDT ENTRY?
IF NOT, GO TO ERROR
IS IT A UDTX ENTRY?
IF NOT, GO HANDLE UDT ENTRY

STORE REGISTER
INCREMENT POINTER
INITIALIZE DDCF TO READ IN UDT
RECORD.

READ IN UDT RECORD (C3H15R6)
READ FLAG

INITIALIZE XR1

ARE THE TWO UDT ENTRIES IDENTICAL?
SKIP IF NOT IDENTICAL
IF IDENTICAL INSERT 'X' IN FIELD
INCREMENT ADDRESS POINTER
HAS END OF RECORD ARRIVED?
IF SO, THEN GO TO NEXT OPERATION
HAS A COMMA BEEN REACHED
IF SO, CHECK THIS ENTRY
IF NOT CHECK NEXT CHARACTER

INCREMENT ADDRESS POINTER
REACHED THE END OF RECORD?
THEN SKIP
REACHED A COMMA?

DD62 3340 CE DISK EDITOR MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1E6C C0 01 1E60          1920         BNE   LOOP21
   1E70 C0 87 1E3B          1921         B     UDSCN
                            1922 *
   1E74 35 01 1E38          1923 UTCNT1  L     TMADR1,XR1
   1E78 D2 01 03            1924         LA    3(,XR1),XR1
   1E7B C2 02 0A83          1925         LA    READIN+3,XR2
                            1926
   1E7F D2 01 01            1927 LOOP22  LA    1(,XR1),XR1
   1E82 7D 40 00            1928         CLI   0(,XR1),C' '
   1E85 C0 01 1E7F          1929         BNE   LOOP22
                            1930
   1E89 7C 6B 00            1931         MVI   0(,XR1),C','
   1E8C 3C FF 1EA4          1932         MVI   MVC9+1,X'FF'
   1E90 D2 01 01            1933 LOOP23  LA    1(,XR1),XR1
   1E93 E2 02 01            1934         LA    1(,XR2),XR2
   1E96 0E 00 1EA4 0A03     1935         ALC   MVC9+1(1),ONE
   1E9C BD 40 00            1936         CLI   0(,XR2),C' '
   1E9F C0 01 1E90          1937         BNE   LOOP23
                            1938
   1EA3 6C 00 00 00         1939 MVC9    MVC   0(*-*,XR1),0(,XR2)
   1EA7 35 01 1E38          1940         L     TMADR1,XR1
   1EAB D2 01 04            1941         LA    4(,XR1),XR1
   1EAE D2 02 00            1942         LA    0(,XR1),XR2
                            1943
   1EB1 7D E7 00            1944 LOOP24  CLI   0(,XR1),C'X'
   1EB4 F2 81 10            1945         JE    UTCNT2
   1EB7 7D 40 00            1946         CLI   0(,XR1),C' '
   1EBA F2 81 37            1947         JE    UTCNT3
   1EBD D2 01 01            1948         LA    1(,XR1),XR1
   1EC0 E2 02 01            1949         LA    1(,XR2),XR2
   1EC3 C0 87 1EB1          1950         B     LOOP24
                            1951
   1EC7 E2 02 01            1952 UTCNT2  LA    1(,XR2),XR2
   1ECA BD 6B 00            1953         CLI   0(,XR2),C','
   1ECD C0 01 1EC7          1954         BNE   UTCNT2
                            1955
   1ED1 34 01 2AB2          1956         ST    ADDR,XR1
   1ED5 6C 00 00 01         1957 UTCNT5  MVC   0(1,XR1),1(,XR2)
   1ED9 BD 40 01            1958         CLI   1(,XR2),C' '
   1EDC F2 81 0A            1959         JE    UTCNT6
   1EDF D2 01 01            1960         LA    1(,XR1),XR1
   1EE2 E2 02 01            1961         LA    1(,XR2),XR2
   1EE5 C0 87 1ED5          1962         B     UTCNT5
                            1963
   1EE9 35 01 2AB2          1964 UTCNT6  L     ADDR,XR1
   1EED D2 02 00            1965         LA    0(,XR1),XR2
   1EF0 C0 87 1EB1          1966         B     LOOP24
                            1967
   1EF4 35 01 1E38          1968 UTCNT3  L     TMADR1,XR1
   1EF8 C2 02 0A80          1969         LA    READIN,XR2
   1EFC C0 87 1429          1970         B     WRT1
                            1971
                            1971
   1F00 3C 01 2BA5          1972 CFRTRN  MVI   NAS,1
   1F04 3C 05 20C7          1973         MVI   PNAS,5
   1F08 C0 87 20C8          1974         B     RWRTN
                            1975
   1F0C 38 F0 27F5          1976         TBN   USECRT,X'F0'
   1F10 C0 90 1DED          1977         BF    CFRT3
   1F14 C0 87 2A2F          1978         B     PRINT1
   1F18 01                  1979         DC    XL1'01'
   1F19 4E                  1980         DC    AL1(REM-REMB)
   1F1A 3599                1981         DC    AL2(REM)
   1F1C C0 87 2A2F          1982         B     PRINT1
   1F20 06                  1983         DC    XL1'06'
   1F21 37                  1984         DC    AL1(REM2-REMB2)
   1F22 35D0                1985         DC    AL2(REM2)
   1F24 C0 87 1DED          1986         B     CFRT3
```

IF NOT, THEN SEARCH THE NEXT CHAR.
IF YES, THEN SEE IF IDENTICAL ENTRY
ALREADY IN UDT TABLE
INITIALIZE POINTERS

INCREMENT POINTER
SCAN TO
END OF RECORD

INSERT COMMA
OVERLAY LENGTH FIELD TO -1 IN MVC
INCREMENT ADDRESS
POINTERS
INCREMENT LENGTH FIELD
REACHED THE END OF UDTX RECORD?
IF NOT, DO IT AGAIN

ADD ENTRY TO UDT RECORD
LOAD ADDRESS
POINTERS

SCAN FOR X ENTRIES
SKIP IF EQUAL
REACHED END OF RECORD?

INCREMENT
POINTERS
SCAN SOME MORE FOR X ENTRIES

INCREMENT ADDRESS POINTER
REACHED A COMMA
IF NOT INCREMENT TO ANOTHER CHAR.

SAVE XR1
OVERLAY OLD ENTRY
REACHED THE END?
THEN QUIT
INCREMENT ADDRESS
POINTERS
DO IT AGAIN

RESTORE
REGISTERS

RESTORE REGISTERS

GO WRITE UDT RECORD

SET UP RWRTN PARAMETERS TO WRITE
NEW ENTRIES FOR DCP
MOVE IN NEW ENTRIES

IF 5471 IS NOT BEING USED THEN
RETURN
DISPLY REMINDER TO IPL MESSAGE
FLAG
MESSAGE LENGTH
MESSAGE ADDRESS
DISPLY REMINDER TO IPL MESSAGE
FLAG
MESSAGE LENGTH
MESSAGE ADDRESS
ALLOW USER TO HIT ENTER AFTER

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1987 *
                         1988 CFGEND SBF   CFIGFG,X'FF'          READING MESSAGE
                                   B       EDITAA               RESET CONFIGURE FLAG
                         1989                                   RETURN TO MAIN OPTION MENU
                         1990 *
                         1991 *            HANDLE ERRORS IN CONFIGURE RECORDS
                         1992 *
1F28 3B FF 2AAE          1993 CFGERR B     PRINT                PRINT 'ERROR IN CONFIG REC'D'
1F2C C0 87 0BCB    1F34  1994        DC    XL1'42'
                   1F35  1995        DC    AL1(CERR-CERKB)
                   1F37  1996        DC    AL2(CERR)
                   1F39  1997        DC    XL2'FFE5'
                         1998        B     PRINT2               PRINT THE INPUT RECORD
                         1999        TBN   USECRT,X'F0'         IF USING THE 5471,DON'T HALT
                         2000        BT    CFRT3
                         2001        B     HALT
                   1F48  2002        DC    XL2'FFE5'
                         2003        B     EDITAA
1F30 C0 87 021A
1F34 42
1F35 38
1F36 3015
1F38 FFE5
1F3A C0 87 2A77
1F3E 38 F0 27F5
1F42 C0 10 1DED
1F46 C0 87 0222
1F4A FFE5
1F4C C0 87 0BCB
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2005 ********************************************************************************
                         2006 *                                                                              *
                         2007 *      THIS PORTION OF THE LISTING CONTAINS THE SUBROUTINES USED                *
                         2008 *      BY THE DIFFERENT PROGRAM OPTIONS.                                       *
                         2009 *                                                                              *
                         2010 ********************************************************************************
                         2011
                         2011
                         2011
                         2011
                         2011
                         2011
                         2011
                         2011
                         2012 **************
                         2013 *   CMPRS    *
                         2014 ********************************************************************************
                         2015 *                                                                              *
                         2016 *            COMPRESS DATA SUBROUTINE                                          *
                         2017 *                                                                              *
                         2018 ********************************************************************************
                         2019
                         2019
1F50 00                  1F50 2020 TEMP9   DC    IL1'0'
1F51 0000                1F52 2021 XR2WK   DC    IL2'0'
                         1F52 2022 TEMP8   EQU   XR2WK
1F53 FFFD                1F54 2023 NEG3    DC    IL2'-3'
1F55 FFFC                1F56 2024 NEG4    DC    IL2'-4'
1F57 0000                1F58 2025 ADDR1   DC    IL2'0'
                         2026
                         2026
1F59 34 08 2028          2027 CMPRS1 ST    COMPXT+3,ARR         STORE EXIT ADDRESS
                         2028
1F5D 3D 01 2AAC          2029        CLI   CD1CR2,1             IS IT A COMPRESSED CARD?
1F61 F2 81 87            2030        JE    CPCNT1               THEN DON'T COMPRESS
                         2031
1F64 34 01 1F58          2032        ST    ADDR1,XR1            STORE XR1
1F68 34 02 2AB2          2033        ST    ADDR,XR2             SAVE XR2
                         2034
1F6C 2C 00 1F50 58       2035        MVC   TEMP9(1),88(,XR2)    SAVE FIRST BYTE OF ID
1F71 C2 02 0AD8          2036        LA    READIN+88,XR2        INITIALIZE XR2
1F75 BD D0 00      AA19  2037        CLI   0(,XR2),X'D0'        IS THIS A NON-UNIQUE CHARACTER?
1F78 F2 01 03            2038        JNE   AA18                 NO,CONTINUE PROCESSING
1F7B BC 2A 00            2039        MVI   0(,XR2),X'2A'        YES, SUBSTITUTE A UNIQUE CONFIG
1F7E 36 02 0B9C    AA18  2040        A     MINUS1,XR2           DECREMENT XR2 TO POINT TO NEXT
1F82 34 02 1F52          2041        ST    XR2WK,XR2            BYTE TO BE COMPRESSED
1F86 0D 01 1F52 3161     2042        CLC   XR2WK(2),READAD      IF ALL TEXT INFO. HAS NOT
1F8C C0 02 1F75          2043        BNL   AA19                 BEEN COMPRESSED, REPEAT THE LOOP
1F90 C2 01 0AD7          2044        LA    READIN+87,XR1        LOAD XR1
1F94 D2 02 00            2045        LA    0(,XR1),XR2          LOAD XR2
1F97 3C 00 1FA2    AA20  2046        MVI   SS1+1,0              INITIALIZE LENGTH FIELD
1F9B 0C 00 1FA6 1FA2     2047 CMLOOP MVC   SS2+1(1),SS1+1
1FA1 AE 00 01 01   SS1   2048        ALC   1(*-*,XR2),1(,XR2)   SHIFT ONE BIT OFF
1FA5 AE 00 01 01   SS2   2049        ALC   1(*-*,XR2),1(,XR2)   SHIFT ONE BIT OFF
1FA9 0E 00 1FA2 0A03     2050        ALC   SS1+1(1),ONE         STEP
1FAF 3D 04 1FA2          2051        CLI   SS1+1,4              TEST FOR 4 BYTES COMPRESSED
1FB3 C0 01 1F9B          2052        BNE   CMLOOP               BRANCH IF NO
1FB7 6C 02 01 00         2053        MVC   1(3,XR1),0(,XR2)     MOVE 3 COMPRESSED BYTES
1FBB 36 01 1F54          2054        A     NEG3,XR1             DECREMENT REGISTERS
1FBF 36 02 1F56          2055        A     NEG4,XR2
1FC3 34 02 1F52          2056        ST    XR2WK,XR2            STORE NEW VALUE
1FC7 0D 01 1F52 3161     2057        CLC   XR2WK(2),READAD      COMPARE WITH LAST ADDRESS
1FCD C0 02 1F97          2058        BNL   AA20                 CONTINUE TILL CARD IS FINISHED
1FD1 35 01 1F58          2059        L     ADDR1,XR1            RELOAD XR1
1FD5 35 02 2AB2          2060        L     ADDR,XR2             RESTORE XR2
                         2061
1FD9 2C 41 0B77 58       2062        MVC   DGSNS1(66),88(,XR2)  ADJUST FIELD TO PROPER POSITION
1FDE 8C 41 42 0B77       2063        MVC   66(66,XR2),DGSNS1
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   1FE3 BC E3 00                2064         MVI   0(,XR2),C'T'          INSERT T
   1FE6 8C 00 58 1F50           2065         MVC   88(1,XR2),TEMP9       REPLACE DESTROYED BYTE
                                2066
   1FEB 3D 0F 2A9D              2067 CPCNT1 CLI    SCDFG,X'0F'           IS THIS A SYSTEM TEST MODULE?
   1FEF F2 81 36                2068         JE    COMPXT                IF SO, DON'T PAD WITH ZEROS
   1FF2 39 0F 2A9A              2069         TBN   PFLAG,X'0F'           IS THIS PROG DATA DECK
   1FF6 F2 90 07                2070         JF    ZOUT                    NO, ZERO OUT THE FIELD
   1FF9 AC 07 4F 5F             2071 SEQMV   MVC   79(8,XR2),95(,XR2)       ELSE MOVE ID/SEQ TO COMP POSITION
   1FFD F2 87 28                2072         J     COMPXT                  YES, THEN DON'T PAD WITH ZEROS
                                2073
   2000 0C 00 200E 0A81         2074 ZOUT    MVC   MVI3+2(1),READIN+1    ZERO OUT UNUSED PORTION OF FIELD
   2006 0E 00 200E 2B0D         2075         ALC   MVI3+2(1),X5          PRECEDED BY A X'FF' DELIMITER
   200C BC FF 00                2076 MVI3    MVI   *-*(,XR2),X'FF'
   200F 0E 00 200E 2B07         2077         ALC   MVI3+2(1),X2
   2015 0C 00 2025 2BE9         2078         MVC   MVC8+1(1),X87
   2018 0F 00 2025 200E         2079         SLC   MVC8+1(1),MVI3+2
   2021 BC 00 57                2080         MVI   87(,XR2),0            ZERO OUT RIGHTMOST BYTE
   2024 AC 00 56 57             2081 MVC8    MVC   86(*-*,XR2),87(,XR2)  ZERO OUT REST OF FIELD
                                2082
   2028 C0 87 0000              2083 COMPXT  B     *-*                   RETURN TO CALLER
                                2084
                                2084
                                2084
                                2084
                                2084
                                2084
                                2084
                                2085 *************
                                2086 *  CONVRT   *
                                2087 ***************************************************************
                                2088 *       THIS SUBRT CONVERTS REP CARDS INTO TEXT CARDS         *
                                2089 *                                                             *
                                2090 ***************************************************************
                                2091
                                2091
   202C 0A84            202D    2092 READ4   DC    AL2(READIN+4)
                                2093
                                2093
   202E 34 08 2089              2094 CONVRT  ST    CONVTR+3,ARR          SAVE RETURN ADDRESS
   2032 34 01 219A              2095         ST    TEMP4,XR1             SAVE REGISTER
   2036 C0 87 0226              2096         B     PACK                  CONVERT FROM EBCDIC TO HEX
   203A 04              203A    2097         DC    IL1'4'                SOURCE LENGTH
   203B 0A85            203C    2098         DC    AL2(READIN+5)         SOURCE
   203D 0A81            203E    2099         DC    AL2(READIN+1)         DESTINATION
   203F 0C 01 0A83 0A81         2100         MVC   READIN+3(2),READIN+1  PUT ADDRESS IN RIGHT PLACE
   2045 0C 01 2063 202D         2101         MVC   DEST(2),READ4         INITIALIZE DESTINATION FIELD
   2048 C2 01 0A88              2102         LA    READIN+8,XR1          LOAD XR1
   204F 3C E3 0A80              2103         MVI   READIN,C'T'           CONVERT TO TEXT CARD
   2053 3C 00 0A81              2104         MVI   READIN+1,0            INITIALIZE LENGTH TO 'ONE'
   2057 34 01 2061              2105 NEXT    ST    SRCE,XR1              UPDATE SOURCE ADDRESS
   2058 C0 87 0226              2106         B     PACK                  CONVERT DATA FROM EBCDIC TO HEX
   205F 02              205F    2107         DC    IL1'2'                LENGTH
   2060 0000            2061    2108 SRCE    DC    AL2(*-*)              SOURCE
   2062 0000            2063    2109 DEST    DC    AL2(*-*)              DESTINATION
   2064 7D 40 01                2110         CLI   1(,XR1),C' '          IS NEXT COLUMN BLANK?
   2067 F2 81 22                2111         JE    CONTA5                CONTINUE PROCESS
   206A 0E 01 0A83 0A03         2112         ALC   READIN+3(2),ONE       INCREMENT RIGHT ADDRES POINTER
   2070 7D 6B 01                2113         CLI   1(,XR1),C','          IS NEXT COLUMN A COMMA?
   2073 F2 01 03                2114         JNE   *+6                   SKIP IF NOT
   2076 D2 01 01                2115         LA    1(,XR1),XR1           INCREMENT POINTER
   2079 D2 01 02                2116         LA    2(,XR1),XR1
   207C 0E 01 2063 0A03         2117         ALC   DEST(2),ONE           INCREMENT DESTINATION FIELD
   2082 0C 00 0A81 0A03         2118         ALC   READIN+1(1),ONE       INCREMENT LENGTH
   2088 C0 87 2057              2119         B     NEXT                  CONTINUE
                                2120 *
                                2121 *               SET REST OF FIELD TO X'00'.
                                2122 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   208C 3C 00 0ADF              2123 CONTA5  MVI   READIN+95,0           CLEAR OUT ID FIELD
   2090 0C 06 0ADE 0ADF         2124         MVC   READIN+94(7),READIN+95
   2096 C2 01 0AD7              2125         LA    READIN+87,XR1
   209A 34 01 2088              2126 CONTA4  ST    TEMP1,XR1
   209E 0D 01 2063 208B         2127         CLC   DEST(2),TEMP1
   20A4 F2 02 0B                2128         JNL   CONTA6
   20A7 7C 00 00                2129         MVI   0(,XR1),0
   20AA 36 01 0B9C              2130         A     MINUS1,XR1
   20AE C0 87 209A              2131         B     CONTA4
   20B2 35 01 219A              2132 CONTA6  L     TEMP4,XR1             RELOAD REGISTER
                                2133
   20B6 C0 87 0000              2134 CONVTR  B     *-*                   RETURN TO CALLER
                                2135
                                2135
                                2135
                                2135
                                2135
                                2135
                                2135
                                2135
                                2136 *************
                                2137 *  RWRTN    *
                                2138 ***************************************************************
                                2139 *       THIS SUBROUTINE READS DATA IN FROM C C H H R FIELD IN FIELD    *
                                2140 *       PNAS, AND WRITES IT ON THE SAME MODULE AT LOCATION C C H H R   *
                                2141 *       IN THE FIELD 'NAS'.                                           *
                                2142 *                                                                     *
                                2143 ***************************************************************
                                2144
                                2144
   20BA 0000            20BB    2145 TEMP1   DC    IL2'0'
   20BC 000000000000    20C1    2146 VTNAS   DC    6IL1'0'
   20C2 000000000000    20C7    2147 PNAS    DC    6IL1'0'
                                2148
                                2148
                        20C8    2149 RWRTN   EQU   *
   20C8 34 08 2137              2150         ST    RWRTNR+3,ARR
   20CC 0C 01 208B 2BCF         2151         MVC   TEMP1(2),SECT#        MOVE # OF SECTORS TO BE MOVED INTO
                                2152 *                                    A BUFFER
   20D2 3C 00 2A98              2153         MVI   NWRTFG,0              RESET FLAG
   20D6 0C 04 2BBF 20C7         2154         MVC   DDCFSM(5),PNAS        SET UP DUAL CONTROL FIELD FOR MOVING
   20DC 0C 04 2BC9 2BA5         2155         MVC   DDCFTM(5),NAS         PROGRAM
                                2156
   20E2 0D 01 208B 2BE7         2157 LOOP17  CLC   TEMP1(2),X48          IS # OF SECTORS < 48?
   20E8 F2 04 0D                2158         JNH   CMCNT2                THEN JUMP
   20EB 3C 2F 2BC3              2159         MVI   DDCFS,47              SET CONTROL FIELD TO MOVE 48 REC'S
   20EF 0F 01 208B 2BE7         2160         SLC   TEMP1(2),X48          DECREMENT COUNTER
   20F5 F2 87 10                2161         J     CMCNT3                JUMP
   20F8 0C 00 2BC3 208B         2162 CMCNT2  MVC   DDCFS(1),TEMP1         SET # OF RECORDS TO MOVE
   20FE 0F 00 2BC3 0A03         2163         SLC   DDCFS(1),ONE          ADJUST IT
   2104 3C 0F 2A9B              2164         MVI   NWRTFG,X'0F'          SET FLAG TO QUIT
                                2165
   2108 0C 00 2BCD 2BC3         2166 CMCNT3  MVC   DDCFT(1),DDCFS         SET BOTH FIELDS
                                2167
   210E C0 87 239C              2168         B     WINRW                 READ IN RECORDS TO MOVE
   2112 80                      2169         DC    XL1'80'               READ FLAG
   2113 4800                    2170         DC    AL2(DDDF)
   2115 2BBA                    2171         DC    AL2(DDCFSB)
                                2172
   2117 C0 87 239C              2173         B     WINRW                 WRITE RECORDS TO MOVE
   211B 40                      2174         DC    XL1'40'               WRITE FLAG
   211C 4800                    2175         DC    AL2(DDDF)
   211E 2BC4                    2176         DC    AL2(DDCFTB)
                                2177
   2120 C0 87 219B              2178         B     STPFLD                STEP CONTROL FIELD
   2124 2BBF                    2179         DC    AL2(DDCFSM)
   2126 C0 87 219B              2180         B     STPFLD                STEP CONTROL FIELD
   212A 2BC9                    2181         DC    AL2(DDCFTM)
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              2182
 212C 3D 00 2A9B              2183         CLI   NWRTFG,0
 2130 C0 81 20E2              2184         BE    LOOP17
                              2185
 2134 C0 87 0000              2186 RWRTNR B      *-*
                              2187
                              2187
                              2187
                              2187
                              2187
                              2187
                              2187
                              2187
                              2188 *************
                              2189 *  RDWRT    *
                              2190 ***************************************************************************
                              2191 *       THIS SUBROUTINE READS FROM ONE DATA MODULE, AND WRITES ON      *
                              2192 *       ANOTHER.  THE FROM DATA MODULE Q CODE SHOULD BE IN 'FRDRV#'    *
                              2193 *       AND THE TO Q CODE IN 'TODRV#'.  THE C C H H FIELD TO START     *
                              2194 *       DUPPING AT IN 'STRSCT', AND THE C C H H FIELD TO STOP AT       *
                              2195 *       IN 'STPSCT'(4 BYTE FIELDS).                                    *
                              2196 *
                              2197 ***************************************************************************
                              2196
                              2198
 2138 00000000        213B    2199 STRSCT DC    4IL1'0'
 213C 00000000        213F    2200 STPSCT DC    4IL1'0'
                              2201
                              2201
 2140 34 08 2193              2202 RDWRT  ST    RDWRTR+3,ARR          SAVE RETURN ADDRESS
                              2203
 2144 0C 03 2BBE 213B         2204         MVC   DDCFSM-1(4),STRSCT    SET UP C C H H FIELD
 214A 3C 01 2BBF              2205         MVI   DDCFSM,1              START AT RECORD 1
 214E 0C 09 2BCD 2BC3         2206         MVC   DDCFT(10),DDCFS       DO THE SAME FOR THE WRITE DDCF
                              2207
 2154 3C 2F 2BC3              2208 LOOP11 MVI   DDCFS,47              SET UP FIELDS TO WRITE
 2158 3C 2F 2BCD              2209         MVI   DDCFT,47                    1 TRACK
                              2210
 215C 0C 00 234E 2BEE         2211         MVC   DRIVE#(1),FRDRV#      SET WINRW TO OPERATE ON RIGHT DRV
 2162 C0 87 239C              2212         B     WINRW                 READ IN 48 RECORDS
 2166 80              2166    2213         DC    XL1'80'               READ FLAG
 2167 4800            2168    2214         DC    AL2(DDDF)
 2169 2BBA            216A    2215         DC    AL2(DDCFSB)
                              2216
 216B 0C 00 234E 2BEF         2217         MVC   DRIVE#(1),TODRV#      SET WINRW TO OPERATE ON RIGHT DRV
 2171 C0 87 239C              2218         B     WINRW                 WRITE 48 RECORDS
 2175 40              2175    2219         DC    XL1'40'               WRITE FLAG
 2176 4800            2177    2220         DC    AL2(DDDF)
 2178 2BC4            2179    2221         DC    AL2(DDCFTB)
                              2222
 217A C0 87 219B              2223         B     STPFLD                INCREMENT DDCFS
 217E 2BBF            217F    2224         DC    AL2(DDCFSM)
 2180 C0 87 219B              2225         B     STPFLD                INCREMENT DDCFT
 2184 2BC9            2185    2226         DC    AL2(DDCFTM)
                              2227
 2186 0D 03 2BBE 213F         2228         CLC   DDCFSM-1(4),STPSCT    IS IT TIME TO QUIT?
 218C C0 82 2154              2229         BL    LOOP11                IF NOT, GO BACK
 219C C0 87 0000              2230 RDWRTR B      *-*                   RETURN TO CALLER
                              2231
                              2231
                              2231
                              2231
                              2231
                              2231
                              2231
                              2231
                              2232 *************
                              2233 *  STPFLD   *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              2234 ***************************************************************************
                              2235 *       THIS SUBRT STEPS THE DISK DRIVE CONTROL FIELD TO                *
                              2236 *       THE NEXT SECTOR.                                                *
                              2237 *       THE FORMAT FOLLOWS:                                             *
                              2238 *                                                                       *
                              2239 *       B      STPFLD                                                   *
                              2240 *       DC     AL2(*-*)          THIS IS THE RIGHT END ADDRESS OF       *
                              2241 *                                A FIVE BYTE FIELD CONTAINING           *
                              2242 *                                C C H H R.                             *
                              2243 *                                                                       *
                              2244 ***************************************************************************
                              2245
                              2245
 2194 0000000000              2198 2246 DDCFX  DC    5IL1'0'
 2199 0000                    219A 2247 TEMP4  DC    IL2'0'
                              2248
                              2248
 219B 34 08 2200              2249 STPFLD ST    STPFLR+3,ARR          SAVE ADDRESS
 219F 0E 01 2200 0A03         2250         ALC   STPFLR+3(2),ONE       POINT TO FIELD ADDRESS
 21A5 0C 01 21B0 2200         2251         MVC   MVC6+5(2),STPFLR+3    OVERLAY INSTRUCTION
 21AB 0C 01 21B6 0000         2252 MVC6   MVC   MVC3+5(2),*-*
 21B1 0C 04 2198 0000         2253 MVC3   MVC   DDCFX(5),*-*            MOVE IN FIELD TO BE WORKED ON
 21B7 0E 01 2200 0A03         2254         ALC   STPFLR+3(2),ONE       POINT TO RETURN ADDRESS
                              2255
 21BD 3D 30 2198              2256         CLI   DDCFX,48              IS R FIELD EQUAL TO 48?
 21C1 F2 02 09                2257         JNE   INCHD                 THEN GO TO NEW HEAD
 21C4 0E 00 2198 0A03         2258         ALC   DDCFX(1),ONE          INCREMENT REC #
 21CA F2 87 24                2259         J     CONTA8
                              2260
 21CD 3D 13 2197              2261 INCHD  CLI   DDCFX-1,19              IS HEAD # 19?
 21D1 F2 02 0D                2262         JNE   INCCL                 THEN INCREMENT CYLINDER
 21D4 3C 01 2198              2263         MVI   DDCFX,1               RESET TO  RECORD 1
 21D8 0E 01 2197 0A03         2264         ALC   DDCFX-1(2),ONE        INCREMENT HEAD
 21DE F2 87 10                2265         J     CONTA8
                              2266
 21E1 0E 01 2195 0A03         2267 INCCL  ALC   DDCFX-3(2),ONE          INCREMENT CYLINDER
 21E7 0C 01 2197 2B47         2268         MVC   DDCFX-1(2),ZERO       HEAD 0
 21ED 3C 01 2198              2269         MVI   DDCFX,1               RECORD 1
                              2270
 21F1 0C 01 21FA 21B6         2271 CONTA8 MVC   MVC4+3(2),MVC3+5        OVERLAY INSTRUCTION
 21F7 0C 04 0000 2198         2272 MVC4   MVC   *-*(5),DDCFX            REPLACE FIELD
                              2273
 21FD C0 87 0000              2274 STPFLR B      *-*                   RETURN TO CALLER
                              2275
                              2275
                              2275
                              2275
                              2275
                              2275
                              2275
                              2275
                              2276 *************
                              2277 *   RDFAS   *
                              2278 ***************************************************************************
                              2279 *       THIS SUBRT SEEKS TO AND READS THE FAS RECORD                    *
                              2280 *       FORMAT FOLLOWS:                                                 *
                              2281 *                                                                       *
                              2282 *       B      RDFAS              THE RECORD READ FROM THE DISK IS       *
                              2283 *                                 DEPOSITED IN THE 12 BYTE FIELD :       *
                              2284 *                                 'FASINF'.                              *
                              2285 *                                                                       *
                              2286 ***************************************************************************
                              2287
                              2287
 2201 34 08 2241              2288 RDFAS  ST    RDFASR+3,ARR          SAVE RETURN ADRESS
 2205 0C 04 2BB5 2B2A         2289         MVC   DDCFRM(5),C3H1R1      SET UP DDCF FIELD TO READ FAS RCRD
 220B 3C 00 2B39              2290         MVI   DDCFR,0
 220F C0 87 239C              2291         B     WINRW                 READ FAS
```

DD62 3340 CE DISK EDITOR MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2213 2292        DC    XL1'80'          READ
                         2215 2293        DC    AL2(DDDF)        @ OF DDDR CONTENTS
                         2217 2294        DC    AL2(DDCFRB)      @ OF DDCR CONTENTS
   2213 80               2295
   2214 4800             2296        CLC   DDDF+2(3),FAS    IS THIS A VIRGIN PACK?
   2216 2B80             2297        JNE   *+12             JUMP IF IT IS.
                         2298        MVC   FASINF(9),DDDF+11 MOVE INFO  TO DESIRED PLACE
   2218 0D 02 4802 2269  2299        J     RDFASR
   221E F2 01 09         2300
   2221 0C 08 2272 480B  2301        MVC   FASINF(2),ZERO   ZERO VTOC ENTRIES
   2227 F2 87 14         2302        MVC   FASINB+8(5),C4HOR1 PUT IN SECTOR OF FIRST FIELD
                         2303        MVI   FASINB+9,0       ZERO FIELD DELIMITERS
   222A 0C 01 2272 2B47  2304        MVI   FASINB+3,0
   2230 0C 04 226F 2B48  2305
   2236 3C 00 2270       2306 RDFASR B     *-*              RETURN TO CALLER
   223A 3C 00 226A       2307
                         2307
   223E C0 87 0000       2307
                         2307
                         2307
                         2307
                         2307
                         2307
                         2308 *************
                         2309 *   WRFAS   *
                         2310 ***************************************************************************
                         2311 *       THIS SUBROUTINE WRITES INFO IN THE FAS REGION                     *
                         2312 *                                                                         *
                         2313 *       FORMAT FOLLOWS:                                                   *
                         2314 *                                                                         *
                         2315 *       B      WRFAS           DATA STORED IN THE 12 BYTE FIELD:  *
                         2316 *                              'FASINF' IS WRITTEN IN THE FAS THE *
                         2317 *                              FAS REGION ON THE DISK.            *
                         2318 *                                                                         *
                         2319 ***************************************************************************
                         2320
                         2320
   2242 34 08 2266       2321 WRFAS  ST    WRFASR+3,ARR     SAVE RETURN ADDRESS
                         2322
   2246 0C 04 2BB5 2B2A  2323        MVC   DDCFRM(5),C3H161 SET UP DDCF FIELD
   224C 3C 00 2BB9       2324        MVI   DDCFR,0
   2250 C0 87 0B78       2325        B     SETTO            SET FIELD TO X'FF' S
   2254 0C 0B 480B 2272  2326        MVC   DDDF+11(12),FASINF SET UP DDDF FIELD TO PROPER INFO
                         2327
   225A C0 87 239C       2328        B     WINRW            WRITE INFO ON MODULE
   225E 40               2329 225E   DC    XL1'40'          WRITE
   225F 4800             2330 2260   DC    AL2(DDDF)        @ OF DDDR CONTENTS
   2261 2BB0             2331 2262   DC    AL2(DDCFRB)      @ OF DDCR CONTENTS
                         2332
   2263 C0 87 0000       2333 WRFASR B     *-*              RETURN TO CALLER
                         2334
                         2334
                         2334
                         2334
                         2334
                         2334
                         2334
                         2335 *************
                         2336 *  SCNVTC   *
                         2337 ***************************************************************************
                         2338 *       THIS SUBROUTINE SCANS VTOC FOR THE ID IN THE PARAMETER            *
                         2339 *       LIST.  IT THEN SETS A FLAG INDICATING SCAN HIT OR NOT.            *
                         2340 *       THE ADDRESS OF THE HIT AND ITS CONTENTS ARE SAVED.                *
                         2341 *                                                                         *
                         2342 *       FORMAT FOLLOWS:                                                   *
                         2343 *                                                                         *
                         2344 *       B      SCNVTC                                                     *
```


DD62 3340 CE DISK EDITOR MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2345 *       DS    XL1              FLAG DEPOSITED BY SUBROUTINE      *
                         2346 *       DC    CL3'PID'         PROGRAM ID TO SCAN FOR IN VTOC     *
                         2347 *                                                                 *
                         2348 *             FLAG BYTE:       X'00'=  NO SCAN HIT THROUGH ENTIRE *
                         2349 *                                       CONTENTS OF VTOC          *
                         2350 *                              X'0F'=  SCAN HIT                  *
                         2351 *       NOTE: ON NO SCAN HIT THE ADDRES LEFT IN THE DDCF FIELD IS *
                         2352 *             THE NEXT AVAILABLE RECORD FOR VTOC.                 *
                         2353 *                                                                 *
                         2354 *       NOTE: TO SCAN TO END OF VTOC, PUT '****' IN PRGID         *
                         2355 *                                                                 *
                         2356 ***************************************************************************
                         2357
                         2357
   2267 C6C1E2           2358 FASINB EQU   *
   226A 0000000000000000 2269 2359 FAS    DC    CL3'FAS'
   2272 00               2272 2360 FASINF DC    9IL1'0'
                         2360
   2273 5C5C5C           226F 2361 FASINM EQU   FASINB+8
   2276 0000             2275 2362 AST    DC    CL3'****'
   2278 00FF             2277 2363 TEMP3  DC    IL2'0'
                         2279 2364 X255   DC    IL2'255'
                         2365
                         2365
                         2365
   227A 34 08 234D       2366 SCNVTC ST    SCNVTR+3,ARR     SAVE RETURN ADDRESS
   227E 34 01 2277       2367        ST    TEMP3,XR1        SAVE XR1
   2262 35 01 234D       2368        L     SCNVTR+3,XR1     LOAD XR1
                         2369
   2286 0E 01 234D 2BDB  2370        ALC   SCNVTR+3(2),X4   INCREMENT TO RETURN ADDRESS
                         2371
   228C C0 87 2201       2372        B     RDFAS            GO READ FAS
   2290 0C 04 2BAB 2B4D  2373        MVC   DDCFM(5),C2HOR1  SET DDCF
   2296 3C 00 2BAF       2374        MVI   DDCF,0
                         2375
   229A 0D 01 2272 2B47  2376        CLC   FASINF(2),ZERO   SEE IF VIRGIN PACK
   22A0 F2 81 87         2377        JE    END1             GO HANDLE IT
                         2378
   22A3 D2 01 03         2379        LA    3(,XR1),XR1      INCREMENT XR1
   22A6 34 01 22C3       2380        ST    MVC1+5,XR1       OVERLAY MOVE INSTRUCTION
   22AA 36 01 1F54       2381        A     NEG3,XR1         DECREMENT XR1 BY 3
                         2382
   22AE 3C FF 48FF       2383        MVI   DDDF+255,X'FF'   FILL DDDF WITH X'FF'
   22B2 0C FE 48FE 48FF  2384        MVC   DDDF+254(255),DDDF+255
                         2385
   22B8 0C 03 4803 2B80  2386        MVC   DDDF+3(4),ACTO   PUT IN SCAN PARAMETERS
   22BE 0C 02 4806 0000  2387 MVC1   MVC   DDDF+6(3),*-*
                         2388
   22C4 0D 02 4806 2275  2389        CLC   DDDF+6(3),AST    IF PID DOESN'T = '****'
   22CA F2 01 0A         2390        JNE   *+13             THEN JUMP
   22CD 3C 00 487F       2391        MVI   DDDF+127,0       OTHERWISE ZERO OUT HALF OF SCAN FLD
   22D1 0C 7E 487E 487F  2392        MVC   DDDF+126(127),DDDF+127
                         2393
   22D7 3C 00 2AA1       2394        MVI   LSTSCN,0
   22DB 0C 00 2315 234E  2395        MVC   TIO18+1(1),DRIVE#  OVERLAY TIO INST
   22E1 3A 03 2315       2396        SEN   TIO18+1,X'03'
   22E5 0C 01 2ACC 2272  2397        MVC   TEMP2(2),FASINF  KEEP HEAD  OF VTOC #
                         2398
   22EB 0D 01 2ACC 2279  2399 LOOP8  CLC   TEMF2(2),X255    IS # OF RECORDS TO SCAN >255?
   22F1 F2 04 0D         2400        JNH   *+16             SKIP IF NOT
   22F4 0F 01 2ACC 2279  2401        SLC   TEMP2(2),X255    DECREMENT COUNTER
   22FA 3C FE 2BAF       2402        MVI   DDCF,254         SET DDCF
   22FE F2 87 0A         2403        J     *+13             SKIP
                         2404
   2301 0C 00 2BAF 2ACC  2405        MVC   DDCF(1),TEMP2    SET LAST  SCAN FLAG
   2307 3C FF 2AA1       2406        MVI   LSTSCN,X'FF'
                         2407
   230B C0 87 239C       2408        B     WINRW            SCAN READ
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   230F 20                230F 2409          DC    XL1'20'
   2310 4800              2311 2410          DC    AL2(DDDF)
   2312 28A6              2313 2411          DC    AL2(DDCFB)
                               2412
   2314 C1 00 2331             2413 TIO18     TIO   CONTE5,*-*
                               2414
                               2415           B     STPFLD
   2318 C0 87 219B             2416           DC    AL2(DDCFM)
   231C 28AB                   2417
                               2418           CLI   LSTSCN,X'FF'
   231E 3D FF 2A61             2419           BNE   LOOP8
   2322 C0 01 22EB             2420
                               2421           ST    MVI1+3,XR1
   2326 34 01 232D             2422
                          232A 2423 END1      EQU   *
   232A 3C 00 0000             2424 MVI1      MVI   *-*,0
   232E F2 87 15               2425           J     SCNVTE
                               2426
   2331 34 01 2338             2427 CONTE5    ST    MVI2+3,XR1
   2335 3C 0F 0000             2428 MVI2      MVI   *-*,X'0F'
   2339 3C 00 28AF             2429           MVI   DDCF,0
   233D C0 87 239C             2430           B     WINRW
   2341 80                2341 2431           DC    XL1'80'
   2342 4800              2343 2432           DC    AL2(DDDF)
   2344 28A6              2345 2433           DC    AL2(DDCFB)
                               2434
   2346 35 01 2277             2435 SCNVTE    L     TEMP3,XR1
   234A C0 87 0000             2436 SCNVTR    B     *-*
                               2437
                               2437
                               2437
                               2437
                               2437
                               2437
                               2437
                               2438 ************
                               2439 *  SELDRV  *
                               2440 ************************************************************************
                               2441 *                                                                      *
                               2442 *            SUBROUTINE TO TEST SENSE SWITCHES AND SELECT              *
                               2443 *            WHICH DISK DRIVE TO USE                                   *
                               2444 *                                                                      *
                               2445 ************************************************************************
                               2446
                               2446
   234E 00                234E 2447 DRIVE# DC    IL1'0'
                               2448
   234F 34 08 2374             2449 SELDRV    ST    SLDRVR+3,ARR          SAVE RETURN ADDRESS
   2353 39 38 020C             2450           TBF   SBYTE4,SSW22+SSW23+SSW24   TEST FOR DRIVE 1
   2357 F2 90 08               2451           JF    *+11
                               2452           MVI   DRIVE#,DR1
                               2453           MVI   KBRDY,C'1'
   235A 3C C0 234E             2454           TBN   SBYTE4,SSW22          SSW10 ON?
   235E 3C F1 3029             2455           JF    SLDRVR                IF NOT RETURN
   2362 38 20 020C             2456           MVI   DRIVE#,DR2
   2366 F2 90 08               2457           MVI   KBRDY,C'2'
   2369 3C C8 234E             2458 *         TBN   SBYTE4,SSW23          SSW11 ON?
   236D 3C F2 3029             2459 *         JF    *+11                  CONTINUE IF NOT
                               2460 *         MVI   DRIVE#,DR3            SET FOR DRIVE 3
                               2461 *         MVI   KBRDY,C'3'
                               2462 *         TBN   SBYTE4,SSW24
                               2463 *         JF    *+11
                               2464 *         MVI   DRIVE#,DR4            SET FOR DRIVE 4
                               2465 *         MVI   KBRDY,C'4'
   2371 C0 87 0000             2466 SLDRVR    B     *-*                   RETURN TO CALLER
```



```
@ OF DDDF
@ OF DDCF

IS IT SCAN   HIT?

INCREMENT SCAN DDCF FIELD


IS LAST SCAN FLAG SET?
RETURN IF NOT

OVERLAY MVI  INST


RESET SCAN HIT FLAG
RETURN

OVERLAY INSTRUCTION
SET SCAN HIT FLAG
READ IN 1 RECORD
READ IN VTOC ENTRY THAT RESULTED
IN THE SCAN HIT.


RELOAD XR1
RETURN TO CALLER
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               2468 ************
                               2469 * WINRW   *
                               2470 ************************************************************************
                               2471 *  SUBROUTINE: READ, WRITE OR SCAN N RECORDS ON 3340                   *
                               2472 *                ACCESS FORMAT:                                        *
                               2473 *       B     WINRW          BRANCH TO SUBROUTINE                     *
                               2474 *       DC    XL1            FLAG                                     *
                               2475 *       DC    AL2(*-*)       @ OF DISK DRIVE DATA FIELD               *
                               2476 *       DC    AL2(*-*)       @ OF DISK DRIVE CONTROL FIELD            *
                               2477 *                                                                     *
                               2478 *       FLAG BITS (NO MORE THAN ONE BIT ON AT A TIME)                 *
                               2479 *             BIT                                                     *
                               2480 *             0-      SEEK AND READ                                   *
                               2481 *             1-      SEEK AND WRITE                                  *
                               2482 *             2-      SEEK AND SCAN READ                              *
                               2483 *                                                                     *
                               2484 *       VALUES OF BYTE 'DRIVE#:                                       *
                               2485 *             DRIVE 1          'DRIVE#'= X'C0'                        *
                               2486 *             DRIVE 2          'DRIVE#'= X'C8'                        *
                               2487 *             DRIVE 3          'DRIVE#'= X'D0'                        *
                               2488 *             DRIVE 4          'DRIVE#'= X'D8'                        *
                               2489 *                                                                     *
                               2490 ************************************************************************
                               2491
                               2491
   2375 0000000000000000  237E 2492 DDCFE   DC    10IL1'0'
   237D 0000                   2492
   237F 0000              2380 2493 TDDDR   DC    IL2'0'
                          2381 2494 QUITFG  EQU   *
   2381 0000              2382 2495 TDDCR   DC    IL2'0'
                          2383 2496 TDDDF   EQU   *
   2383 0000000000000000  238B 2497          DC    9IL1'0'
   238B 00                     2497
                          238C 2498 TDDCF   EQU   *
   238C 0000000000        2390 2499          DC    5IL1'0'
   2391 238C              2392 2500 TDDCF@  DC    AL2(TDDCF)
   2393 2383              2394 2501 TDDDF@  DC    AL2(TDDDF)
                          2395 2502 OUTREC  EQU   *
   2395 0000000000        2399 2503          DC    5IL1'0'
   239A 0C8F              239B 2504 LINKM@  DC    AL2(LINKM)
                               2505
                               2505
                               2505
   239C 34 08 2522             2506 WINRW    ST    WINRWR+3,ARR          SAVE ADDRESS
   23A0 34 01 2AB2             2507          ST    ADDR,XR1              SAVE XR1
   23A4 35 01 2522             2508          L     WINRWR+3,XR1          LOAD POINTER REGISTER
   23A8 0E 01 2522 2BDD        2509          ALC   WINRWR+3(2),X5        SET RETURN ADDRESS TO NEXT INST
                               2510
   23AE 3C 0A 2BEA             2511          MVI   ICTR,10               INITIALIZE COUNTER
   23B2 1C 01 23E0 04          2512          MVC   MOV1+5(2),4(XR1)      OVERLAY MVC INST
   23B7 0C 01 251E 23E8        2513          MVC   MV14+3(2),MOV1+5      OVERLAY MOVE INSTRUCTON
   23BD 0E 01 23E0 2BDD        2514          ALC   MOV1+5(2),X5          CHANGE POINTER
   23C3 0E 01 23E0 2BD9        2515          ALC   MOV1+5(2),X3
   23C9 0C 01 23D8 23EC        2516          MVC   MVC10+3(2),MOV1+5     OVERLAY KEY AND DATA LENGTHS
   23CF 0E 01 23E0 0A03        2517          ALC   MOV1+5(2),ONE
   23D5 0C 02 0000 2B77        2518 MVC10    MVC   *-*(3),X256
   23DB 0C 09 237E 0000        2519 MOV1     MVC   DDCFE(10),*-*         STORE DDCF IN ALTERNATE PLACE
   23E1 0C 01 24B8 23E0        2520          MVC   MOV2+3(2),MOV1+5      OVERLAY MOVE INSTRUCTION
   23E7 0D 03 2379 2B74        2521          CLC   DDCFE-5(4),C33H18     TRYING TO ADD TOO FAR?
   23ED C0 84 2735             2522          DH    TOOFAR
                               2523
   23F1 78 20 00               2524          TBN   0(,XR1),X'20'         IS IT SCAN HEAD REQUEST?
   23F4 C0 10 24D9             2525          BT    SCANRD
                               2526                                                                  *
                               2527 *                                                                *
                               2528 *        THIS SECTION OVERLAYS I/O INSTRUCTIONS FOR CORRECT DRIVE *
                               2529 *                                                                *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2530
  23F8 0C 00 246F 234E   2531        MVC   SIO1+1(1),DRIVE#    OVERLAY SIO INSTRUCTION
  23FE 0C 00 246C 234E   2532        MVC   SIO5+1(1),DRIVE#    OVERLAY SIO INST
  2404 0C 00 2472 234E   2533        MVC   TIO4+1(1),DRIVE#    OVERLAY TIO INST
  240A 3A 02 2472        2534        SBN   TIO4+1,X'02'
  240E 0C 00 24AF 234E   2535        MVC   SIO7+1(1),DRIVE#    OVERLAY SIO INST
  2414 0C 00 24B2 234E   2536        MVC   TIO5+1(1),DRIVE#    OVERLAY TIO INST
  241A 3A 01 24B2        2537        SBN   TIO5+1,X'01'
  241E 0C 00 2468 234E   2538        MVC   TIO1+1(1),DRIVE#    OVERLAY TIO INST
  2424 0C 00 2476 234E   2539        MVC   TIO7+1(1),DRIVE#    OVERLAY TIO INST
                         2540
  242A 78 40 00          2541        TBN   0(,XR1),X'40'       SEE  IF READ OR WRITE REQUEST
  242D F2 10 07          2542        JT    **10
  2430 3A 01 246F        2543        SBN   SIO1+1,X'01'        OVERLAY FOR READ
  2434 F2 87 2A          2544        J     RTRY1               JUMP IF WRITE
  2437 3A 02 246F        2545        SBN   SIO1+1,X'02'        OVERLAY FOR WRITE
  243B 0C 01 24A0 23E0   2546        MVC   CLI1+3(2),MOV1+5    OVERLAY CLI INST
  2441 0C 01 2489 23E0   2547        MVC   MOV3+3(2),MOV1+5    OVERLAY MVC INST
  2447 0C 00 2490 246C   2548        MVC   SIO8+1(1),SIO5+1    OVERLAY SIO INST
  244D 0C 00 2493 246C   2549        MVC   SIO9+1(1),SIO5+1    OVERLAY SIO INST
  2453 3A 01 2493        2550        SBN   SIO9+1,X'01'        FURTHER OVERLAY SIO INST
  2457 0C 00 2496 234E   2551        MVC   TIO8+1(1),DRIVE#    OVERLAY TIO INST
  245D 3A 02 2496        2552        SBN   TIO8+1,X'02'
                         2553
                      2461 2554 RTRY1  EQU   *
                         2555
                         2556
  2461 71 C4 02          2556        LIO   2(,XR1),DDDR        LOAD DISK DRIVE DATA REGISTER
  2464 71 C6 04          2557        LIO   4(,XR1),DDCR        LOAD DISK DRIVE CONTROL REGISTER
                         2558
  2467 C1 00 26B1        2559 TIO1   TIO   HALT1,*-*           TEST FOR DEVICE NOT READY
  246B F3 00 00          2560 SIO5   SIO   X'00',*-*           SEEK
                         2561
                      246E 2562 DRTRN2 EQU   *
                         2563
  246E F3 00 00          2564 SIO1   SIO   X'00',*-*           READ OR WRITE N RECORDS
  2471 C1 00 2471        2565 TIO4   TIO   *,*-*               TEST FOR ADAPTER NOT BUSY
  2475 C1 00 2703        2566 TIO7   TIO   HALT2,*-*           TEST FOR NOT READY DURING INST
                         2567
  2479 38 02 246F        2568        TBN   SIO1+1,X'02'        IS IT WRITE INST?
  247D F2 90 97          2569        JF    WINRWT              IF NOT, RETURN TO CALLER
                         2570
  2480 0C 00 249A 234E   2571        MVC   TIO19+1(1),DRIVE#   OVERLAY TIO
  2486 0C 09 0000 237E   2572 MOV3   MVC   *-*(10),DDCFE
  248C 71 C4 02          2573        LIO   2(,XR1),DDDR        RELOAD DDDR
  248F F3 00 00          2574 SIO8   SIO   0,*-*               SEEK
                      2492 2575 DRTRN3 EQU   *
  2492 F3 00 03          2576 SIO9   SIO   3,*-*               READ VERIFY
  2495 C1 00 2495        2577 TIO8   TIO   *,*-*               WAIT TILL DRIVE NOT BUSY
  2499 C1 00 24D1        2578 TIO19  TIO   CHK1,*-*            UNIT CHECK?
  249D 3D FF 0000        2579 CLI1   CLI   *-*,X'FF'           SUCCESSFUL READ VERIFY?
  24A1 F2 81 73          2580        JE    WINRWT
                         2581
  24A4 0F 00 2BEA 0A03   2582 BRTRY1 SLC   ICTR(1),ONE         IS THIS THE 10TH TIME?
  24AA C0 81 2699        2583        BZ    EE2                 IF YES GO TO END ROUTINE
  24AE F3 00 01          2584 SIO7   SIO   X'01',*-*           RECALIBRATE
  24B1 C1 00 24E1        2585 TIO5   TIO   *,*-*               WAIT FOR SEEK NOT BUSY
  24B5 C0 09 0000 237E   2586 MOV2   MVC   *-*(10),DDCFE      RELOAD DDCF FIELD
                         2587
  24BB 7D 20 00          2588        CLI   0(,XR1),X'20'       IS IT A SCAN READ?
  24BE F2 81 3E          2589        JE    TIO9-6              IF SO, RETURN TO THAT SECTION
  24C1 38 FF 25E1        2590        TBN   WRTVFY,X'FF'        IS IT WRITE VERIFY?
  24C5 3B FF 25E1        2591        SBF   WRTVFY,X'FF'
  24C9 C0 10 2486        2592        BT    MOV3                IF SO, THAN RETURN TO THAT SECTION
  24CD C0 87 24D1        2593        B     RTRY1               RETRY DISK OPERATION
                         2594
  24D1 3C FF 25E1        2595 CHK1   MVI   WRTVFY,X'FF'
  24D5 C0 87 2703        2596        B     HALT2
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         2597
                         2597
                         2597
  24D9 0C 00 250D 234E   2598 SCANRD MVC   SIO10+1(1),DRIVE#    OVERLAY SIO INSTR
  24DF 3A 03 250D        2599        SBN   SIO10+1,X'03'
  24E3 0C 00 250A 234E   2600        MVC   SIO11+1(1),DRIVE#   OVERLAY SIO INST
  24E9 0C 00 2506 234E   2601        MVC   TIO9+1(1),DRIVE#    OVERLAY TIO INSTR
  24EF 0C 00 2510 234E   2602        MVC   TIO10+1(1),DRIVE#   OVERLAY TIO INSTR
  24F5 3A 02 2510        2603        SBN   TIO10+1,X'02'
  24F9 0C 00 2514 234E   2604        MVC   TIO11+1(1),DRIVE#   OVERLAY TIO INSTR
  24FF 71 C4 02          2605        LIO   2(,XR1),DDDR        LOAD DDDR
  2502 71 C6 04          2606        LIO   4(,XR1),DDCR        LOAD DDCR
  2505 C1 00 26B1        2607 TIO9   TIO   HALT1,*-*           TEST FOR DEVICE NOT READY
  2509 F3 00 00          2608 SIO11  SIO   X'00',*-*           SEEK
                         2609
                      250C 2610 DRTRN1 EQU   *
  250C F3 00 0C          2611 SIO10  SIO   X'0C',*-*           EXECUTE SCAN READ
  250F C1 00 250F        2612 TIO10  TIO   *,*-*               WAIT UNTIL DONE
  2513 C1 00 2703        2613 TIO11  TIO   HALT2,*-*           TEST FOR UNIT CHECK
                         2614
                         2614
  2517 35 01 2AB2        2615 WINRWT L     ADDR,XR1
  251B 3C 00 0000        2616 MVI4   MVI   *-*,0               ZER OUT FLAG BYTE BEFORE RETURNING
  251F C0 87 0000        2617 WINRWR B     *-*                 RETURN TO CALLER
                         2618
                         2618
                         2619 *
                         2620 *      THIS SECTION FINDS THE ALTERNATE TRACK ADDRESS SEEKS TO IT     *
                         2621 *      AND RETURNS CONTROL; OR, WHEN COMING OFF AN ALTERNATE TRACK,   *
                         2622 *      IT GETS THE PROGRAM BACK TO THE RIGHT TRACK.                   *
                         2623 *                                                                     *
                         2624
                         2624
  2523 34 08 254C        2625 DEFTRK ST    DEFTKR+3,ARR        SAVE ADDRESS
  2527 0F 00 2BEA 0A03   2626        SLC   ICTR(1),ONE         DECREMENT LOOP COUNTER
  252D C0 81 2699        2627        BZ    EE2                 QUIT IF 10 TIMES
  2531 3D 0D 0B67        2628        CLI   DEVTE7,X'0D'        COMPARE BYTE 7
  2535 F2 81 15          2629        JE    TODTRK              IF='0D' THEN SEEK TO ALTERNATE
                         2630
  2538 0C 01 2541 251E   2631        MVC   MVI5+3(2),MVI4+3    OVERLAY INTSTRUCTION TO ZERO DDCF
  253E 3C 00 0000        2632 MVI5   MVI   *-*,0               FLAG BYTE.
                         2633
  2542 3D 0E 0B67        2634        CLI   DEVTE7,X'0E'
  2546 F2 81 7D          2635        JE    FRDTRK
  2549 C0 87 0000        2636 DEFTKR B     *-*                 RETURN TO CALLER
                         2637
  254D 0C 00 2584 234E   2638 TODTRK MVC   TIO15+1(1),DRIVE#   OVERLAY TOP ONST
  2553 0C 00 2588 234E   2639        MVC   SIO2+1(1),DRIVE#    OVERLAY SIO INST
  2559 3A 01 2588        2640        SBN   SIO2+1,X'01'
  255D 0C 00 25A0 2588   2641        MVC   SIO4+1(1),SIO2+1
  2563 0C 00 258F 234E   2642        MVC   SIO3+1(1),DRIVE#    OVERLAY SIO INST
  2569 0C 01 25AC 23E0   2643        MVC   MVC2+3(2),MOV1+5    PUT DDCF ADDRES IN MOVE INST
  256F 0F 01 25AC 28DD   2644        SLC   MVC2+3(2),X5        ADJUST ADDRESS
  2575 0C 00 259C 2584   2645        MVC   TIO2+1(1),TIO15+1
                         2646
                         2646
  257B 30 C4 2380        2647        SNS   TDDDR,DIDR          SAVE CONTENTS OF DDDR
  257F 31 C4 2394        2648        LIO   TDDDF@,DDDR         LOAD DDDR WITH TEMPORARY VALUE
  2583 C1 00 26B1        2649 TIO15  TIO   HALT1,*-*           SEE IF DEVICE IS READY
  2587 F3 00 01          2650 SIO2   SIO   X'01',*-*           READ HA AND R0 FIELDS
  258A 31 C6 2394        2651        LIO   TDDDF@,DDDR         CHANGE THE DDCF FOR SEEK
  258E F3 00 00          2652 SIO3   SIO   X'00',*-*           SEEK TO ALTERNATE TRACK
  2591 0C 04 2399 2387   2653        MVC   OUTREC+4(5),TDDDF+4
  2597 31 C4 2394        2654        LIO   TDDDF@,DDDR
  259B C1 00 26B1        2655 TIO2   TIO   HALT1,*-*
  259F F3 00 01          2656 SIO4   SIO   X'01',*-*           READ HA & R0 OF ALT TRACK
  25A2 71 C6 04          2657        LIO   4(,XR1),DDCR        RELOAD DDCR
  25A5 31 C4 2380        2658        LIO   TDDDR,DDDR          RELOAD DDDR
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   25A9 0C 04 0000 2387        2659 MVC2   MVC   *-*(5),TDDDF+4      MOVE CORRECT HIGH ORDER 5 BYTES
                               2660 *                                INTO DDCF FIELD
                               2661
   25AF 7D 20 00               2662         CLI   0(,XR1),X'20'
   25B2 C0 81 250C             2663         BE    DRTRN1              RETURN TO SEEK IN SCANRD SECTION
   25B6 38 FF 25E1             2664         TBN   WRTVFY,X'FF'        FROM WRITE VERIFY?
   25BA 3B FF 25E1             2665         SBF   WRTVFY,X'FF'        RESET FLAG
   25BE C0 10 2492             2666         BT    DRTRN3
   25C2 C0 87 246E             2667         B     DRTRN2              RETURN TO SEEK IN RD,WRT,OR SK SCT
                               2668
                         25C6  2669 FRDTRK EQU   *
   25C6 7D 20 00               2670         CLI   0(,XR1),X'20'       IS IT A SCAN READ?
   25C9 C0 81 2505             2671         BE    TIO9                IF SO, RETURN TO THAT SECTION
   25CD 38 FF 25E1             2672         TBN   WRTVFY,X'FF'        IS IT A WRITE VERIFY?
   25D1 3B FF 25E1             2673         SBF   WRTVFY,X'FF'
   25D5 C0 10 248F             2674         BT    SIO8                IF SO, RETURN TO THAT SECTION
   25D9 C0 87 2467             2675         B     TIO1                RETURN TO READ OR WRITE SECTION
                               2676 *
                               2677 *              SENSE DIAGNOSTIC 24 BYTES SUBROUTINE
                               2678 *
                               2679 *
   25DD 0B60             25DE  2680 DGSNS@ DC    AL2(DGSNSB)
   25DF 0000             25E0  2681 TEM1   DC    IL2'0'
   25E1 00               25E1  2682 WRTVFY DC    IL1'0'
                               2683
   25E2 34 08 2606             2684 SNS24  ST    SNS24R+3,ARR        SAVE ADDRESS
   25E6 30 C5 0A14             2685         SNS   STATE,X'C5'         DIAGNOSTIC SENSE
   25EA 30 C4 25E0             2686         SNS   TEM1,DDDR           SAVE DDDR
   25EE 31 C4 25DE             2687         LIO   DGSNS@,DDDR         LOAD DDDR
   25F2 0C 00 25FD 234E        2688         MVC   SIO6+1(1),DRIVE#    OVERLAY INST
   25F8 3A 01 25FD             2689         SBN   SIO6+1,X'01'        CONTINUE OVERLAY
   25FC F3 00 07               2690 SIO6   SIO   X'07',*-*           SENSE DIAGNOSTIC 24 BYTES
                               2691
   25FF 31 C4 25E0             2692         LIO   TEM1,DDDR           RELOAD DDDR
   2603 C0 87 0000             2693 SNS24R B     *-*                 RETURN TO CALLER
                               2694
                               2694
   2607 34 08 267C             2695 SNSAP  ST    SNSAPR+3,ARR        SAVE RETURN ADDRESS
   260B 34 01 2ACE             2696         ST    TEMP6,XR1           SAVE INDEX REGISTERS
   260F 34 02 219A             2697         ST    TEMP4,XR2
   2613 C2 01 0B60             2698         LA    DGSNSB,XR1          INITIALIZE ADDRESS POINTERS
   2617 C2 02 0B08             2699         LA    DGS2B+2,XR2
                               2700 *
                               2701 *              FOLLOWING ROUTINE UNPACKS THE 24 BYTE DIAGNOSTIC READ
                               2702 *              TO BE PRINTED
                               2703 *
   261B 3C 06 2B0E             2704         MVI   CTR1,6              INITIALIZE DO LOOP COUNTERS
   261F 3C 04 2B0F             2705 LOOP13 MVI   CTR2,4
   2623 34 01 2631             2706 LOOP14 ST    UP1,XR1             SET UNPACK ADDRESSES
   2627 34 02 2633             2707         ST    UP2,XR2
   262B C0 87 021E             2708         B     UNPACK              TO DCP UNPACK ROUTINE
   262F 01               262F  2709         DC    IL1'1'
   2630 0000             2631  2710 UP1    DC    AL2(*-*)
   2632 0000             2633  2711 UP2    DC    AL2(*-*)
   2634 BC 40 01               2712         MVI   1(,XR2),C' '        INSERT BLANK BETWEEN BYTES
   2637 D2 01 01 01            2713         LA    1(,XR1),XR1         INCREMENT ADDRESS POINTERS
   263A E2 02 03               2714         LA    3(,XR2),XR2
   263D 0F 00 2B0F 0A03        2715         SLC   CTR2(1),ONE         DECREMENT LOOP COUNTER
   2643 C0 01 2623             2716         BNZ   LOOP14
   2647 BC 02 01 0B09          2717         MVC   1(3,XR2),BLNK       INSERT 4 BLANKS BETWEEN EVERY 4
                               2718 *                                BYTES
   264C E2 02 03               2719         LA    3(,XR2),XR2
   2650 0F 00 2B0E 0A03        2720         SLC   CTR1(1),ONE         DECREMENT LOOP COUNTER
   2655 C0 01 261F             2721         BNZ   LOOP13
                               2722
   2659 C0 87 021A             2723         B     PRINT               TO DCP PRINT RTN
   265D 02               265D  2724         DC    XL1'02'             FLAG
   265E 2D               265E  2725         DC    AL1(EDMS2-EDMS2B)   LENGTH
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   265F 2D25             2660 2726         DC    AL2(EDMS2)          PRINT ADDRESS
                               2727
   2661 C0 87 021A             2728         B     PRINT
   2665 02               2665  2729         DC    XL1'02'             FLAG (NO HEADING)
   2666 56               2666  2730         DC    AL1(HDG1-HDG1B)     LENGTH
   2667 2CD3             2668  2731         DC    AL2(HDG1)           ADDRESS
                               2732
   2669 C0 87 021A             2733         B     PRINT
   266D 06               266D  2734         DC    XL1'06'             FLAG
   266E 56               266E  2735         DC    AL1(DGSNS2-DGS2B)   LENGTH
   266F 0B5F             2670  2736 DGPRT@ DC    AL2(DGSNS2)         ADDRESS
                               2737
   2671 35 01 2ACE             2738         L     TEMP6,XR1           RESTORE INDEX REGISTERS
   2675 35 02 219A             2739         L     TEMP4,XR2
   2679 C0 87 0000             2740 SNSAPR B     *-*                 RETURN TO CALLER
                               2741
                               2741
*  267D C0 87 021A             2742 EE1    B     PRINT               PRINT 'ADAPTER CHECK'
*  2681 C2               2681  2743         DC    XL1'C2'             FLAG
*  2682 15               2682  2744         DC    AL1(ERMS1-ERMS1B)   LENGTH
*  2683 2C7D             2684  2745         DC    AL2(ERMS1)          ADDRESS
   2685 FFFF             2686  2746         DC    XL2'FFFF'           ID
   2687 C0 87 25E2             2747         B     SNS24
   268B C0 87 2607             2748         B     SNSAP
   268F C0 87 0222             2749         B     HALT                TO DCP HALT   ROUTINE
   2693 FFFF             2694  2750         DC    XL2'FFFF'           FLAG
   2695 C0 87 0C8F             2751         B     LINKM               TERMINATE SECTION
                               2752
                               2752
   2699 C0 87 021A             2753 EE2    B     PRINT
   269D C2               269D  2754         DC    XL1'C2'             FLAG
   269E 25               269E  2755         DC    AL1(EDMS1-EDMS1B)   LENGTH
   269F 2CF8             26A0  2756         DC    AL2(EDMS1)          PRINT ADDRESS
   26A1 FFFE             26A2  2757         DC    XL2'FFFE'           ID
   26A3 C0 87 2607             2758         B     SNSAP
   26A7 C0 87 0222             2759         B     HALT                BRANCH TO DCP HALT ROUTINE
   26AB FFFE             26AC  2760         DC    XL2'FFFE'           HALT ID
   26AD C0 87 0C8F             2761         B     LINKM               TERMINATE SECTION
                               2762
                               2763 *                                                        *
                               2764 *                                                        *
                               2765 *              DEVICE NOT READY OR ERROR SUBROUTINE      *
                               2766 *              *                 *                       *
                         26B1  2767 HALT1  EQU   *
   26B1 34 08 2702             2768         ST    HALT1R+3,ARR        STORE RETURN ADDRESS
   26B5 0F 01 2702 2BDB        2769         SLC   HALT1R+3(2),X4      RETURN TO TIO INSTRUCTION THAT
                               2770 *                                CALLED IT
   26BB C0 87 25E2             2771         B     SNS24               SENSE DIAGNOSTIC 24 BYTES
   26BF 38 10 0A13             2772 HALT1A TBN   STATE-1,X'10'        CHECK TO SEE WHAT DRIVE UNIT CHECK
   26C3 F2 90 04               2773         JF    *+7                 OCCURRED AND PUT IT IN MESSAGE
   26C6 3C F4 2C50             2774         MVI   ERMSG-24,C'4'
   26CA 38 20 0A13             2775         TBN   STATE-1,X'20'
   26CE F2 90 04               2776         JF    *+7
   26D1 3C F3 2C50             2777         MVI   ERMSG-24,C'3'
   26D5 38 40 0A13             2778         TBN   STATE-1,X'40'
   26D9 F2 90 04               2779         JF    *+7
   26DC 3C F2 2C50             2780         MVI   ERMS(-24,C'2'
   26E0 38 80 0A13             2781         TBN   STATE-1,X'80'
   26E4 F2 90 04               2782         JF    *+7
   26E7 3C F1 2C50             2783         MVI   ERMSG-24,C'1'
   26EB C0 87 021A             2784         B     PRINT               TO DCP PRINT ROUTINE
   26EF C6               26EF  2785         DC    XL1'C6'             FLAG
   26F0 24               26F0  2786         DC    AL1(ERMSG-ERMSGB)   LENGTH
   26F1 2C68             26F2  2787         DC    AL2(ERMSG)          MSG @
   26F3 FFFC             26F4  2788         DC    XL2'FFFC'           HEADING
                               2789
   26F5 C0 87 2607             2790         B     SNSAP               PRINT WHAT YOU HAVE SENSED
                               2791
```

DD62 3340 CE DISK EDITOR MOD 12

```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT
                               2792          B      HALT                TO DCP HALT ROUTINE
    26F9 C0 87 0222       26FE 2793          DC     XL2'FFFC'           HEADING
    26FD FFFC                  2794
                               2795 HALT1R   B      *-*                 RETURN TO CALLER
    26FF C0 87 0000            2796
                               2796
                               2796
                               2796
                          2703 2797 HALT2    EQU    *
    2703 C0 87 25E2            2798          B      SNS24
    2707 38 01 0A14            2799          TBN    STATE,X'01'         CHECK IF ANY CHECKS OCCURRED
    270B C0 10 267D            2800          BT     EE1
                               2801                                     SEE IF DEFECTIVE TRACK. IF IT IS
    270F 39 02 0B60            2802          TBF    DBYTE0,TRKCC
    2713 39 01 0B61            2803          TBF    DBYTE1,OPINCP       THEN READ ALTERNATE TRACK LOCATION,
    2717 C0 90 2523            2804          BF     DEFTRK              SEEK TO IT, AND CONTINUE OPERATION.
                               2805 *
                               2806                                     IF ANY OF THESE
    2718 39 25 0B60            2807          TBF    DBYTE0,X'25'            BITS ARE ON
    271F 39 1C 0B61            2808          TBF    DBYTE1,X'1C'                 THEN RETRY OPERATION
    2723 39 78 0B62            2809          TBF    DBYTE2,X'78'
    2727 C0 90 24A4            2810          BF     BRTRY1
                               2811
                               2811                                     AFTER HALT1, TERMINATE SECTION
    272B 0C 01 2702 239B       2812          MVC    HALT1R+3(2),LINKM@  PRINT 'DEVICE NOT READY OR CHECK'
    2731 C0 87 26BF            2813          B      HALT1A
                               2814
                               2814
                               2814
                               2814                                     PRINT 'NO ROOM LEFT ...'
    2735 C0 87 021A            2815 TOOFAR   B      PRINT
    2739 C6               2739 2816          DC     XL1'C6'
    273A 4E               273A 2817          DC     AL1(ERR14-ERR14B)
    273B 2E72             273C 2818          DC     AL2(ERR14)
    273D FFEE             273E 2819          DC     XL2'FFEE'           HALT   -EE-
    273F C0 87 0222            2820          B      HALT
    2743 FFEE             2744 2821          DC     XL2'FFEE'
    2745 C0 87 0BCB            2822          B      EDITAA
```


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```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT
                               2824 ****************************************************************
                               2825 *   INPUT ROUTINES                                             *
                               2826 *                                                              *
                               2827 *       THE FOLLOWING ROUTINES WILL ALLOW                      *
                               2828 *       INPUT RECORDS TO BE READ.                              *
                               2829 *                                                              *
                               2830 *       SSW18 = 1442 AS INPUT DEVICE                           *
                               2831 *       SSW17 = 3741 AS INPUT DEVICE                           *
                               2832 *       SSW1A = MFCU AS INPUT DEVICE                           *
                               2833 *       NO SETTING = 5471 AS INPUT DEVICE                      *
                               2834 ****************************************************************
                               2835
    2749 34 08 27EC            2836 RECORD   ST     XEXITR+3,ARR        SAVE RETURN ADDRESS
    274D C2 02 0A80            2837 TRYAGN   LA     READIN,XR2          SET XR2 TO POINT TO READIN
    2751 BC 40 5F              2838          MVI    95(,XR2),C' '       BLANK INPUT BUFFER
    2754 AC 5E 5E 5F           2839          MVC    94(95,XR2),95(,XR2)
                               2840
    2758 38 F0 27F5            2841          SBF    USECRT,X'F0'        RESET USECRT FLAG
    275C 3C 02 2AAC            2842          MVI    CD1OR2,2            SET FLAG FOR READING UNCOMPRESS DATA
                               2843
    2760 38 01 020D            2844          TBN    SWITCH+3,SSW2F      IF SSW 2F ON, DO FE7 PROCEDURE
    2764 F2 90 1A              2845          JF     CK18                IF OFF, NORMAL PROCESSING
    2767 34 01 2AB2            2846          ST     ADDR,XR1            SAVE XR1
    276B 0C 01 2774 3FFF       2847          MVC    GOOUT+3(2),X3FFF    SET UP LINKAGE TO FE7 ROUTINE
    2771 C0 87 0000            2848 GOOUT    B      *-*                 GO TO OUT IN FE7
    2775 35 01 2AB2            2849          L      ADDR,XR1            RESTORE REGISTERS
    2779 C2 02 0A80            2850          LA     READIN,XR2
    277D C0 87 27C1            2851          B      XEXIT               RETURN TO CALLER
                               2852
    2781 38 80 020B            2853 CK18     TBN    SWITCH+1,SSW18      TEST SSW 18
    2785 C0 10 29EB            2854          BT     LD1442              IF ON, USE THE 1442 AS INPUT.
    2789 38 01 020A            2855          TBN    SWITCH,SSW17        TEST SSW 17
    278D F2 10 DD              2856          JT     LD3741              IF ON, USE THE 3741 AS INPUT.
    2790 38 20 020B            2857          TBN    SWITCH+1,SSW1A      TEST SSW 1A,
    2794 C0 10 2984            2858          BT     MFCU                IF ON, USE THE MFCU AS INPUT.
    2798 38 10 020B            2859          TBN    SWITCH+1,SSW1B      IS SSW1B ON
    279C F2 10 08              2860          JT     CLE55               IF SO USE PROGRAM E55 AS INPUT
    279F 3A F0 27F5            2861          SBN    USECRT,X'F0'        USE THE 5471 FOR INPUT
    27A3 C0 87 27F6            2862          B      LD5471              IF NO SWITCHES ON USE 5471 FOR INPUT
                               2863
    27A7 34 01 2AB2            2864 CLE55    ST     ADDR,XR1            SAVE ADDRESS IN XR1
    27AB 0C 01 27B4 7001       2865          MVC    BE55+3(2),X'7001'   GO TO 7001 AND GET ADDRESS TO BRANCH
    27B1 C0 87 0000            2866 BE55     B      *-*                 BRANCH TO E55
    27B5 C2 02 0A80            2867          LA     READIN,XR2          RESTORE XR2
    27B9 35 01 2AB2            2868          L      ADDR,XR1            RESTORE XR1
    27BD 3C 02 2AAC            2869          MVI    CD1OR2,2            SET FLAG FOR UNCOMPRESSED FORMAT
                               2870
    27C1 38 0F 2AAD            2871 XEXIT    TBN    ADDFLG,X'0F'        ADD MODE SWITCH ON?
    27C5 F2 90 21              2872          JF     XEXITR              IF NOT RETURN TO CALLER
    27C8 C0 87 0B8A            2873          B      SET0                SET DDDF FIELD TO ZERO
    27CC 6C 5F DF 5F           2874          MVC    223(96,XR1),95(,XR2)  PUT CARD IMAGE IN TO DISK FIELD
    27D0 3D 02 2AAC            2875          CLI    CD1OR2,2            IS IT IN UNCOMPRESSED FORMAT?
    27D4 F2 81 12              2876          JE     XEXITR              IF YES, RETURN TO CALLER
    27D7 38 01 020D            2877          TBN    SWITCH+3,SSW2F      SKIP IF CALLED BY FE7 OR CCC
    27DB F2 10 0B              2878          JT     XEXITR
    27DE 38 01 020A            2879          TBN    SWITCH,SSW17        USING 3741 THEN RECORDS IN
    27E2 F2 10 04              2880          JT     XEXITR              COMPRESS FORM
                               2881
    27E5 AC 07 5F 4F           2882          MVC    95(8,XR2),79(,XR2)  ADJUST ID AND SEQ # FIELDS
    27E9 C0 87 0000            2883 XEXITR   B      *-*                 RETURN TO CALLER
                               2884
                               2884
                               2884
                               2884
    27ED 5050             27EE 2885 X80      DC     XL2'5050'           FOR 2560 READ LENGTH (80)
    27EF 0A80             27F0 2886 CARD1@   DC     AL2(READIN)         ADDRESS OF FIRST CARD READIN AREA
    27F1 3900             27F2 2887 BUF14    DC     XL2'3900'
                          27F2 2888 CARD2@   EQU    BUF14               ADDRESS OF 2ND CARD READIN AREA
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  27F3 0000              27F4 2889 STATUX DC    XL2'0'
  27F5 00                27F5 2890 USECRT DC    IL1'0'              SWITCH FOR NOT PRINTING ON 5471
                              2891
                              2891
                              2891
                              2891
                              2892 ********************************************************************
                              2893 *    5471 INPUT ROUTINE                                            *
                              2894 *                                                                  *
                              2895 *    CODE TO READ RECORD FROM THE 5471 PRINTER/KEYBOARD            *
                              2896 ********************************************************************
                              2897
                              27F6 2898 LD5471 EQU   *
  27F6 C0 87 234F                   2899        B     SELDRV              SET DRIVE # IN DISPLAY
  27FA 35 02 2821                   2900 RTRY   L     XEXT1+3,XR2         LOAD THE @ OF READ BUFFER
  27FE AC 83 83 84                  2901        MVC   131(132,XR2),132(,XR2) CLEAR BUFFER
  2802 F3 18 41                     2902        SIO   X'41',X'18'         START CARRIAGE RETURN + RESET PRT
  2805 F3 10 11                     2903 NXTCHR SIO   X'11',X'10'         PROCEED IND ON + RESET REG KEY
  2808 30 11 2BF2                   2904 RESNS  SNS   DAT,X'11'           CHARACTER KEYED
  280C 38 40 2BF2                   2905        TBN   DAT,X'40'           END OR CANCEL KEYED
  2810 F2 90 13                     2906        JF    TSTDAT              NO
  2813 38 20 2BF2                   2907        TBN   DAT,X'20'           CANCEL KEYED
  2817 C0 10 27FA                   2908        BT    RTRY                YES
  2818 F3 10 01                     2909        SIO   1,X'10'            RESET REQUEST KEY
  281E C2 02 0A80                   2910 XEXT1  LA    READIN,XR2          LOAD @ OF BUFFER
  2822 C0 87 2855                   2911        B     DORD                CHECK FOR INPUT
  2826 38 08 2BF2                   2912 TSTDAT TBN   DAT,X'08'           DATA KEYED
  282A C0 90 2608                   2913        BF    RESNS               NO
  282E 38 04 2BF2                   2914        TBN   DAT,X'04'           RETURN KEY PRESSED
  2832 C0 10 27FA                   2915        BT    RTRY                YES
  2836 8C 00 00 2BF1                2916        MVC   0(1,XR2),DAT-1
  283B 31 18 2BF2                   2917        LIO   DAT,X'18'           MOVE CHARACTER TO BE PRINTED
  283F F3 18 81                     2918        SIO   X'81',X'18'         PRINT CHARACTER
  2842 E2 02 01                     2919        LA    1(,XR2),XR2         MOVE TO NEXT CHARACTER
  2845 34 02 2BF2                   2920        ST    TSTN,XR2            STORE CONTENTS OF REG
  2849 3D E0 2BF2                   2921        CLI   TSTN,X'E0'
  284D C0 81 281E                   2922        BE    XEXT1
  2851 C0 87 2805                   2923        B     NXTCHR
  2855 F3 18 40                     2924 DORD   SIO   X'40',X'18'         RETURN CARRIAGE
  2858 3D 40 0B03                   2925 DOREAD CLI   READIN+131,C' '     CHECK FOR BLANK INPUT
  285C F2 01 0A                     2926        JNE   NOTBLK
  285F 0D 82 0B02 0B03              2927        CLC   READIN+130(131),READIN+131
  2865 C0 81 27FA                   2928        BE    RTRY
  2869 C0 87 27C1                   2929 NOTBLK B     XEXIT
                                    2930
                                    2930
                                    2930
                                    2930
                                    2931 ********************************************************
                                    2932 *                                                      *
                                    2933 *          3741 INPUT ROUTINE                          *
                                    2934 *                                                      *
                                    2935 ********************************************************
                              286D  2936 LD3741 EQU   *
  286D 38 10 2AA2                   2937        TBN   F3741,X'10'         HAVE WE READ THE LAST RECORD
  2871 F2 90 0D                     2938        JF    DOSIO               JUMP IF NOT
  2874 8C 01 01 2AA9                2939        MVC   1(2,XR2),SLAMP      MOVE IN A '/&'
  2879 3B FF 2AA2                   2940        SBF   F3741,X'FF'         TURN OFF ALL FLAGS
  287D C0 87 2927                   2941        B     EOJ1                GO END IT
  2881 31 41 2983                   2942 DOSIO  LIO   FUNBT1,X'41'        LOAD THE FUNCTION BYTE
  2885 30 43 2981                   2943        SNS   SNBYT2,X'43'        SENSE I/O TRANSFER LINES
  2889 38 04 2980                   2944        TBN   SNBYT2-1,X'04'      ARE WE READY
  288D F2 90 DA                     2945        JF    ERR11               NO ERROR
  2890 38 02 2980                   2946        TBN   SNBYT2-1,X'02'      TEST FOR READ BIT ON
  2894 F2 10 1C                     2947        JT    CONT11              LOOP UNTIL READ BIT IS ON
  2897 C0 87 021A                   2948        B     PRINT               PRINT MSG' 3741 NOT IN READ MODE'
  289B C1                     289B  2949        DC    XL1'C1'             SPACE
  289C 1D                     289C  2950        DC    IL1'29'             LENGTH
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  289D 3661              289E 2951        DC    AL2(RDMD)           MSG @
  289F FFF1              28A0 2952        DC    XL2'FFF1'           HALT INDICATOR
  28A1 C0 87 021A              2953        B     PRINT               PRINT INFO MSG
  28A5 06                28A5 2954        DC    XL1'06'             SPACE
  28A6 45                28A6 2955        DC    IL1'69'             LENGTH
  28A7 36A6              28A8 2956        DC    AL2(SETUP)          MSG @
  28A9 C0 87 0222              2957        B     HALT                INDICATE 'F1' ON STIK LIT
  28AD FFF1              28AE 2958        DC    XL2'FFF1'
  28AF C0 87 2881              2959        B     DOSIO               RETURN
  28B3 F3 43 08                2960 CONT11 SIO   X'08',X'43'          NORMAL RESPONSE TO 3741
  28B6 3C 01 2AAC              2961        MVI   CD1OR2,1            SET FOR COMPRESS
  28BA 31 44 27F0              2962        LIO   CARD1@,X'44'        PUT READ @ IN DSAR
  28BE 31 42 297F              2963        LIO   LENCT2,X'42'        PUT 255-LENGTH IN LC REG
  28C2 F3 41 00                2964        SIO   0,X'41'             READ NEXT RECORD
  28C5 C1 42 28C5              2965        TIO   *,X'42'             TEST UNTIL 3741 NOT BUSY
  28C9 30 42 29B1              2966        SNS   SNBYT2,X'42'        GET THE STATUS BYTE
  28CD 39 0A 2980              2967        TBF   SNBYT2-1,X'0A'      PARITY READ ERROR OR LCR OVFLW
  28D1 C0 90 296A              2968        BF    ERR11               HALT IF EITHER CONDITION EXIST
  28D5 F3 43 08                2969        SIO   X'08',X'43'          NORMAL RESPONSE TO 3741
  28D8 38 01 2AA2              2970        TBN   F3741,X'01'         ADD FLAG ON
  28DC F2 10 2D                2971        JT    EOJCHK
  28DF BD 5B 00                2972        CLI   0(,XR2),C'$'        CONTROL CARD READ
  28E2 F2 01 04                2973        JNE   *+7                 JUMP IF NOT
  28E5 3A 08 2AA2              2974        SBN   F3741,X'08'         SET CONTROL FLAG ON
  28E9 BD 61 00                2975        CLI   0(,XR2),C'/'        CONTROL CARD READ
  28EC F2 01 0A                2976        JNE   CTLREC              ASSUME A CONTROL RECORD
  28EF BD 50 01                2977        CLI   1(,XR2),C'&'        TERMINATOR RECORD?
  28F2 F2 81 39                2978        JE    FIN                 GO FINISH READING
  28F5 3A 08 2AA2              2979        SBN   F3741,X'08'         SET CONTROL RECORD BIT
  28F9 38 08 2AA2              2980 CTLREC TBN   F3741,X'08'         SET CONTROL FLAG ON
  28FD F2 10 0C                2981        JT    EOJCHK
  2900 3A 01 2AA2              2982        SBN   F3741,X'01'         SET THE ADD AND REPLACE FLAGS ON
  2904 3C F1 2AA3              2983        MVI   FADD,C'1'           SET FORCED ADD FLAG
  2908 C0 87 0D2F              2984        B     RTRN2               RETURN TO PROCESS 1ST RECORD
  290C 30 43 2981              2985 EOJCHK SNS   SNBYT2,X'43'        SENSE I/O TRANSFER LINES
  2910 38 02 2980              2986        TBN   SNBYT2-1,X'02'      READ BIT ON
  2914 F2 10 13                2987        JT    CDEXIT              RETURN
  2917 38 08 2981              2988        TBN   SNBYT2,X'08'        END OF JOB
  291B C0 90 290C              2989        BF    EOJCHK
  291F 3A 10 2AA2              2990        SBN   F3741,X'10'         TURN ON LAST RECORD
  2923 C0 87 27C1              2991        B     XEXIT               RETURN
  2927 F3 43 08                2992 EOJ1   SIO   X'08',X'43'          NORMAL RESPONSE TO 3741
  292A C0 87 27C1              2993 CDEXIT B     XEXIT                 RETURN TO CALLER
  292E 30 43 2981              2994 FIN    SNS   SNBYT2,X'43'          SENSE I/O TRANSFER LINES
  2932 38 02 2980              2995        TBN   SNBYT2-1,X'02'        READ BIT ON
  2936 F2 10 0C                2996        JT    NXT                   RETURN
  2939 38 08 2981              2997        TBN   SNBYT2,X'08'          END OF JOB
  293D C0 10 2927              2998        BT    EOJ1
  2941 C0 87 292E              2999        B     FIN                 LOOP
  2945 F3 43 08                3000 NXT    SIO   X'08',X'43'          NORMAL RESPONSE TO 3741
  2948 31 44 27F2              3001        LIO   CARD2@,X'44'        PUT READ @ IN DSAR
  294C 31 42 297F              3002        LIO   LENCT2,X'42'        PUT 255-LENGTH IN LC REG
  2950 F3 41 00                3003        SIO   0,X'41'             READ NEXT RECORD
  2953 C1 42 2953              3004        TIO   *,X'42'             TEST UNTIL 3741 NOT BUSY
  2957 30 42 2981              3005        SNS   SNBYT2,X'42'        GET THE STATUS BYTE
  295B 39 0A 2980              3006        TBF   SNBYT2-1,X'0A'      PARITY READ ERROR OR LCR OVFLW
  295F C0 90 296A              3007        BF    ERR11               HALT IF EITHER CONDITION EXIST
  2963 F3 43 08                3008        SIO   X'08',X'43'          NORMAL RESPONSE TO 3741
  2966 C0 87 292E              3009        B     FIN                   LOOP TO TEST
  296A C0 87 021A              3010 ERR11  B     PRINT               BRANCH TO PRINT MFCU NOT READY OR
                               3011 *                                ERROR.
  296E 46                296E  3012        DC    XL1'46'             FLAGS
  296F 23                296F  3013        DC    IL1'35'             LENGTH
  2970 29E7              2971  3014        DC    AL2(ERRORC)         ADDRESS OF LAST PRINT CHARACTER
  2972 FFEC              2973  3015        DC    XL2'FFEC'           MESSAGE IDENTIFICATION
  2974 C0 87 0222              3016        B     HALT                  ISSUE HALT 'EC'
  2978 FFEC              2979  3017        DC    XL2'FFEC'
  297A C0 87 2881              3018        B     DOSIO                 GO TRY START I/O
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   297E 007F             297F 3019 LENCT2 DC    XL2'007F'
   2980 0000             2981 3020 SNBYT2 DC    XL2'0'
   2982 4000             2983 3021 FUNBT1 DC    XL2'4000'
                              3022 ************************************************************
                              3023 *              MFCU INPUT ROUTINE                          *
                              3024 ************************************************************
                              3025
   2984 C1 F0 29A7            3026 MFCU   TIO   ERR,X'F0'          TEST FOR NOT READY OR ERROR
   2988 31 F5 27F0            3027        LIO   CARD1@,X'F5'       LOAD DATA READIN ADDRESS
   298C F3 F1 00              3028        SIO   X'00',X'F1'        READ CARD INTO I/O AREA
   298F C1 F1 298F            3029        TIO   *,X'F1'            WAIT
   2993 30 F3 27F4            3030        SNS   STATUX,X'F3'       SENSE DEVICE STATUS
   2997 39 86 27F4            3031        TBF   STATUX,X'86'       TEST FOR READ OR FEED CHECK
   299B 3C 02 2AAC            3032        MVI   CD1UR2,2           SET FOR UNCOMPRESSED DATA
   299F C0 10 2A0C            3033        BT    XEXT
   29A3 C0 87 2984            3034        B     MFCU
                              3035
   29A7 34 08 29C4            3036 ERR    ST    ERR1+3,ARR         STORE RETURN ADDRESS
   29AB 0F 01 29C4 2BDB       3037        SLC   ERR1+3(2),4                AND ADJUST IT
   29B1 C0 87 021A            3038        B     PRINT              BRANCH TO PRINT MFCU NOT READY OR
                              3039 *                               ERROR.
   29B5 46                29B5 3040        DC    XL1'46'            FLAGS
   29B6 23                29B6 3041        DC    XL1'35'            LENGTH
   29B7 29E7              29B8 3042        DC    AL2(ERRORC)        ADDRESS OF LAST PRINT CHARACTER
   29B9 FFEC              29BA 3043        DC    XL2'FFEC'          MESSAGE IDENTIFICATION
   29BB C0 87 0222            3044        B     HALT               BRANCH TO DCP HALT
   29BF FFEC              29C0 3045        DC    XL2'FFFC'          HALT ID
   29C1 C0 87 0000            3046 ERR1   B     *-*                RETURN TO TIO
                              3047
   29C5 C1D3E3C5D9D5C1E3 29E7 3048 ERRORC DC    CL35'ALTERNATE LOADER NOT READY OR ERROR'
   29CD C540D3D6C1C4C5D9      3048
   29D5 40D5D6E340D9C5C1      3048
   29DD C4E840D6D940C5D9      3048
   29E5 D9D6D9                3048
                              3049
                              3049
                              3049
                              3049
                              3050 ************************************************************
                              3051 *              1442 INPUT ROUTINE                          *
                              3052 ************************************************************
                              3053
   29E8 31 54 27F0            3054 LD1442 LIO   CARD1@,X'54'
   29EC 3C 01 2AAC            3055        MVI   CD1UR2,1           SET FLAG FOR COMPRESSED DATA
   29F0 C0 87 2A10            3056        B     RD1442
   29F4 BD E7 4C              3057        CLI   76(,XR2),C'X'      TEST FOR A 96 BYTE RECORD
   29F7 C0 01 2A0C            3058        BNE   XEXT
   29FB 31 54 27F2            3059        LIO   BUF14,X'54'        IF SO THEN READ SECOND
   29FF 3C 02 2AAC            3060        MVI   CD1UR2,2           SET FLAG FOR UNCOMPRESSED DATA
   2A03 C0 87 2A10            3061        B     RD1442             CARD AND MOVE 20 BYTES
   2A07 8C 13 5F 3913         3062        MVC   95(20,XR2),CARD2A+19 TO MAKE A 96 BYTE RECORD
   2A0C C0 87 2858            3063 XEXT   B     DOREAD             CHECK INPUT
                              3064
   2A10 34 08 2A2A            3065 RD1442 ST    X1442,ARR
   2A14 C1 50 29A7            3066 DX14   TIO   ERR,X'50'          TEST FOR NOT READY OR ERROR
   2A18 F3 51 00              3067        SIO   X'00',X'51'        READ CARD INTO I/O AREA
   2A1B C1 52 2A18            3068        TIO   *,X'52'            WAIT
   2A1F 30 53 27F4            3069        SNS   STATUX,X'53'       SENSE DEVICE STATUS
   2A23 39 93 27F4            3070        TBF   STATUX,X'93'       TEST FOR READ OR FEED CHECK
   2A27 C0 10 0000            3071        BT    *-*
                         2A2A 3072 X1442   EQU   *-4
   2A2B C0 87 2A14            3073        B     DX14
                              3074
                              3074
                              3074
                              3074
                              3074
                              3074
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              3075 ************************************************************
                              3076 *              5471 PRINT ROUTINE                          *
                              3077 ************************************************************
   2A2F 34 08 2A76            3078 PRINT1 EQU   *
   2A33 3B F1 27F5            3079        ST    PRTEND+3,ARR       STORE THE RETURN @
   2A37 34 01 219A            3080        SBF   USECRT,X'F1'       SET OFF USECRT
   2A3B 35 01 2A76            3081        ST    TEMP4,XR1          SAVE THE CONTENTS OF XR1
   2A3F 39 01 020A            3082        L     PRTEND+3,XR1       LOAD @ OF THE PRINTER PARM LIST
   2A43 39 A0 020B            3083        TBF   SWITCH,SSW17       ARE WE USING 3741
   2A47 F2 10 03              3084        TBF   SWITCH+1,SSW18+SSW1A ARE WE USING 5424 OR 1442
   2A4A F2 87 1B              3085 NODS   BT    DS471              NO,THEN JUMP
   2A4D 3A F0 27F5            3086        J     PASPRM             YES,DON'T PRINT ON 5471
   2A51 1C 00 2A64 00         3087 DS471  SBN   USECRT,X'F0'       SET BIT FOR 5471
   2A56 1C 00 2A65 01         3088        MVC   PRTPRM(1),0(,XR1)  BUILD
   2A5B 1C 01 2A67 03         3089        MVC   PRTPRM+1(1),1(,XR1)      PARM LIST
   2A60 C0 87 021A            3090        MVC   PRTPRM+3(2),3(,XR1)            FOR 5471 OR PRINTER
                              3091        B     PRINT              GO PRINT
   2A64 00000000         2A64 3092 PRTPRM EQU   *                 PRINTER PARM LIST
   2A68 D2 01 06              3093        DC    4XL1'00'
   2A6B 34 01 2A76            3094 PASPRM LA    4(,XR1),XR1        POINT TO 1ST INSTRUCTION PASSED PARM
   2A6F 35 01 219A            3095        ST    PRTEND+3,XR1       STORE THAT @ INTO RETURN BRANCH
   2A73 C0 87 0000            3096        L     TEMP4,XR1          RESTORE XR1 TO ORIGINAL VALUE
                              3097 PRTEND B     *-*                RETURN TO CALLER
                              3098 ************************************************************
                              3099 * THIS ROUTINE WILL SET UP THE PRINTER SO THAT THE FIRST SIX POSITIONS*
                              3100 * OF THE PRINT DATA IS NOT LOSSED WHEN PRINTING ON THE ALTERNATE PRINT*
                              3101 * DEVICE.                                                    *
                              3102 ************************************************************
   2A77 34 08 2A99            3103 PRINT2 EQU   *
   2A7B 36 04 0208            3104        ST    RTRN6+3,ARR        STORE THE RETURN @
   2A7F F2 10 09              3105        TBN   SWITCH-2,SSW05     TEST FOR ALTERNATE PRINT DEVICE
   2A82 0C 5F 08D8 0ADF       3106        BT    PRT2               YES,LOAD AT X'880'
   2A86 F2 87 06              3107        MVC   X87C+95(95),READIN+95 MOVE IN DATA TO BE PRINTED
   2A8B 0C 5A 08DA 0ADA       3108        J     PRT3               JUMP AROUND
   2A91 C0 87 021A            3109 PRT2   MVC   X880+90(91),READIN+90 MOVE IN DATA TO BE PRINTED
                              3110 PRT3   B     PRINT              GO PRINT
   2A95 26                2A95 3111        DC    XL1'26'            FLAG
   2A96 C0 87 0000            3112 RTRN6  B     *-*                RETURN TO CALLER
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         3114 *********
                         3115 * DC'S  *
                         3116 ********************************************************************************
                         3117
                         3117
                         3117
                         3117
   2A9A 00               2A9A 3118 PFLAG  DC    IL1'0'          THESE
   2A9B 00               2A9B 3119 NWRTFG DC    IL1'0'             MUST
   2A9C 00               2A9C 3120 CPUDFG DC    IL1'0'                REMAIN
   2A9D 00               2A9D 3121 SCDFG  DC    IL1'0'                   TOGETHER.
   2A9E 00               2A9E 3122 LWRT   DC    IL1'0'                      ZEROED
   2A9F 00               2A9F 3123 DFLAG  DC    IL1'0'                         AT ABOUT
   2AA0 00               2AA0 3124 DCPFG  DC    IL1'0'                               RTRN2
                         3125
   2AA1 00               2AA1 3126 LSTSCN DC    IL1'0'
   2AA2 00               2AA2 3127 F3741  DC    IL1'0'
   2AA3 F0               2AA3 3128 FADD   DC    CL1'0'
   2AA4 5BC1C4C4         2AA7 3129 DADD   DC    CL4'$ADD'
   2AA8 6150             2AA9 3130 SLAMP  DC    CL2'/&'
   2AAA 00               2AAA 3131 CPUFG  DC    IL1'0'
   2AAB 00               2AAB 3132 FSTCPU DC    IL1'0'
   2AAC 02               2AAC 3133 CD1DR2 DC    IL1'2'
   2AAD 00               2AAD 3134 ADDFLG DC    IL1'0'
   2AAE 00               2AAE 3135 CFIGFG DC    IL1'0'
   2AAF 0000             2AB0 3136 VTOC#  DC    IL2'0'
   2AB1 0000             2AB2 3137 ADDR   DC    IL2'0'
   2AB3 00               2AB3 3138 CARSAV DC    IL1'0'
   2AB4 00               2AB4 3139 HARSAV DC    IL1'0'
   2AB5 0000             2AB6 3140 WORK   DC    IL2'0'
   2AB7 0000             2AB8 3141 CL3    DC    IL2'0'
   2AB9 0000             2ABA 3142 HL3    DC    IL2'0'
   2ABB 0000             2ABC 3143 CLW    DC    IL2'0'
   2ABD 0000             2ABE 3144 HLW    DC    IL2'0'
   2ABF 0000             2AC0 3145 CPW    DC    IL2'0'
   2AC1 0000             2AC2 3146 HPW    DC    IL2'0'
   2AC3 00FF             2AC4 3147 CKER   DC    XL2'00FF'
   2AC5 0000             2AC6 3148 COUNT  DC    IL2'0'
   2AC7 40404040         2ACA 3149 SAVEID DC    CL4'    '
                         2ACA 3150 TEMP5  EQU   SAVEID
   2ACB 0000             2ACC 3151 TEMP2  DC    IL2'0'
   2ACD 0000             2ACE 3152 TEMP6  DC    IL2'0'
   2ACF 0000             2AD0 3153 TEMP7  DC    IL2'0'
   2AD1 F0F0F0F0         2AD4 3154 DO     DC    CL4'0000'
   2AD5 C4F0             2AD6 3155 DDO    DC    CL2'D0'
   2AD7 F0F0F0F0         2ADA 3156 LSTDCD DC    CL4'0000'
   2ADB F1               2ADB 3157 D1     DC    CL1'1'
   2ADC F0F4F8           2ADE 3158 D48    DC    CL3'048'
   2ADF F1F2F0           2AE1 3159 D120   DC    CL3'120'
   2AE2 F7F6F8           2AE4 3160 MAXPGM DC    CL3'768'
   2AE5 D7D5             2AE6 3161 PN     DC    CL2'PN'
   2AE7 D4C5             2AE8 3162 ME     DC    CL2'ME'
   2AE9 E240             2AEA 3163 SB     DC    CL2'S '
   2AEB C3D7E440         2AEE 3164 CPUIDZ DC    CL4'CPU '
   2AEF 616140C3C8C1C9D5 2AF6 3165 CHNID  DC    CL8'// CHAIN'
   2AF7 E2E2E640         2AFA 3166 SSWID  DC    CL4'SSW '
   2AFB E4C4E340         2AFE 3167 UDTID  DC    CL4'UDT '
   2AFF D6D3C4           2B01 3168 OLD    DC    CL3'OLD'
   2B02 C3D6             2B03 3169 FIGCON DC    CL2'CO'
   2B04 C3D4             2B05 3170 CMPCON DC    CL2'CM'
   2B06 C3F1             2B07 3171 WINID  DC    CL2'C1'
   2B08 F0F0F0F0         2B0B 3172 SEQCTR DC    CL4'0000'
   2B0C 0000             2B0D 3173 RCTR   DC    IL2'0'
   2B0E 0C               2B0E 3174 CTR1   DC    IL1'0'
   2B0F 00               2B0F 3175 CTR2   DC    IL1'0'
   2B10 8001             2B11 3176 XREG   DC    XL2'8001'
   2B12 0003             2B13 3177 SVPREQ DC    XL2'0003'
   2B14 C6C6C1           2B16 3178 FFA    DC    CL3'FFA'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   2B17 C6C6C2           2B19 3179 FFB    DC    CL3'FFB'
   2B1A C6C6C6           2B1C 3180 DCPID  DC    CL3'FFF'
   2B1D F06B6B40         2B20 3181 DTAHDR DC    CL4'0,, '
   2B21 0003001102       2B25 3182 C3H172 DC    XL5'0003001102'
   2B26 0003001001       2B2A 3183 C3H161 DC    XL5'0003001001'
   2B2B 0003001002       2B2F 3184 C3H162 DC    XL5'0003001002'
   2B30 0003001003       2B34 3185 C3H163 DC    XL5'0003001003'
   2B35 0003001004       2B39 3186 C3H164 DC    XL5'0003001004'
   2B3A 0003001005       2B3E 3187 C3H165 DC    XL5'0003001005'
   2B3F 0003000001       2B43 3188 C3H0   DC    XL5'0003000001'
   2B44 0004000001       2B48 3189 C4H0R1 DC    XL5'0004000001'
   2B49 0002000001       2B4D 3190 C2H0R1 DC    XL5'0002000001'
   2B4E 000003000F       2B52 3191 C3H15  DC    XL5'000003000F'
   2B53 000000001B       2B57 3192 C0H027 DC    XL5'000000001B'
   2B58 0000000201       2B5C 3193 C0H2R1 DC    XL5'0000000201'
   2B5D 0003001101       2B61 3194 FFALOC DC    XL5'0003001101'
   2B62 0000000030       2B66 3195 CMIDLC DC    XL5'0000000030'
   2B67 0000000030       2B6B 3196 C0H048 DC    XL5'0000000030'
   2B6C 0001000001       2B70 3197 C1H0R1 DC    XL5'0001000001'
   2B71 00210012         2B74 3198 C33H18 DC    XL4'00210012'
                         2B47 3199 ZERO   EQU   C4H0R1-1
   2B75 000100           2B77 3200 X256   DC    IL3'256'
   2B78 4A               2B78 3201 X74    DC    IL1'74'
   2B79 005F             2B7A 3202 X95    DC    IL2'95'
   2B7B 0200             2B7C 3203 X200   DC    XL2'0200'
   2B7D C1C3E3           2B7F 3204        DC    CL3'ACT'
   2B80 00               2B80 3205 ACT0   DC    XL1'00'
   2B81 0013             2B82 3206 X19    DC    IL2'19'
                         2B83 3207 VTIMB  EQU   *
   2B83 C1C3E3           2B85 3208        DC    CL3'ACT'
   2B86 00000000000000000 2B9F 3209 VTIM   DC    26IL1'0'
   2B8E 00000000000000000       3209
   2B96 00000000000000000       3209
   2B9E 0000                    3209
                         2B98 3210 SCTR   EQU   VTIMB+21
   2BA0 000000000000     2BA5 3211 NAS    DC    6IL1'0'
                         2BA6 3212 DDCFB  EQU   *
   2BA6 00000000000000001 2BAF 3213 DDCF   DC    XL10'0C000000000000010000'
   2BAE 0000                    3213
                         2BAB 3214 DDCFM  EQU   DDCFB+5
                         2BB0 3215 DDCFRB EQU   *
   2BB0 00000000000000001 2BB9 3216 DDCFR  DC    XL10'00000000000000010000'
   2BB8 0000                    3216
                         2BB5 3217 DDCFRM EQU   DDCFRB+5
                         2BBA 3218 DDCFSB EQU   *
   2BBA 00000000000000001 2BC3 3219 DDCFS  DC    XL10'00000000000C00010000'
   2BC2 0000                    3219
                         2BBF 3220 DDCFSM EQU   DDCFSB+5
                         2BC4 3221 DDCFTB EQU   *
   2BC4 00000000000000001 2BCD 3222 DDCFT  DC    XL10'00000000000C00010000'
   2BCC 0000                    3222
                         2BC9 3223 DDCFTM EQU   DDCFTB+5
   2BCE 0000             2BCF 3224 SECT#  DC    IL2'0'
   2BD0 0000000000       2BD4 3225 XLOC   DC    5IL1'0'
   2BD5 00               2BD5 3226 CMID   DC    IL1'0'
   2BD6 0002             2BD7 3227 X2     DC    IL2'2'
   2BD8 0003             2BD9 3228 X3     DC    IL2'3'
   2BDA 0004             2BDB 3229 X4     DC    IL2'4'
   2BDC 0005             2BDD 3230 X5     DC    IL2'5'
   2BDE 0006             2BDF 3231 X6     DC    IL2'6'
   2BE0 0008             2BE1 3232 X8     DC    IL2'8'
   2BE2 000C             2BE3 3233 X12    DC    IL2'12'
   2BE4 002F             2BE5 3234 X47    DC    IL2'47'
   2BE6 0030             2BE7 3235 X48    DC    IL2'48'
   2BE8 0057             2BE9 3236 X87    DC    IL2'87'
   2BEA 00               2BEA 3237 ICTR   DC    IL1'0'
   2BEB 00               2BEB 3238 LCTR   DC    IL1'0'
   2BEC 00               2BEC 3239 KCTR   DC    IL1'0'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2BED 00               2BED 3240 MCTR   DC    IL1'0'
   2BEE 00               2BEE 3241 FRDRV# DC    IL1'0'
   2BEF 00               2BEF 3242 TODRV# DC    IL1'0'
   2BF0 00               2BF0 3243 DELFG  DC    IL1'0'
   2BF1 0000             2BF2 3244 TSTN   DC    XL2'0'
   2BF3 27C1             2BF4 3245 EXITA  DC    AL2(XEXIT)
   2BF5 C4C5             2BF6 3246 DEL    DC    CL2'DE'
   2BF7 C4E4             2BF8 3247 DU     DC    CL2'DU'
                         2BF8 3248 VMSGB  EQU   *-1
   2BF9 D5D64B40D6C640D7 2C17 3249 VTOC1# DC    CL31'NO. OF PGM. ENTRIES LEFT IS XXX'
   2C01 C7D44B40C5D5E3D9       3249
   2C09 C9C5E240D3C5C6E3       3249
   2C11 40C9E240E7E7E7         3249
   2C18 6B40E2D7C1C3C540 2C3B  3250 SPACE# DC    CL36', SPACE AVAILABLE FOR PGMS. IS XXXXX'
   2C20 C1E5C1C9D3C1C2D3       3250
   2C28 C540C6D6D940D7C7       3250
   2C30 D4E24B40C9E240E7       3250
   2C38 E7E7E7E7               3250
   2C3C 40E2C5C3E3D6D9E2 2C44  3251 VMSG   DC    CL9' SECTORS.'
   2C44 4B                     3251
                         2C44  3252 ERMSGB EQU   *-1
   2C45 F3F3F4F040C4D9C9 2C68  3253 ERMSG  DC    CL36'3340 DRIVE X NOT READY OR UNIT CHECK'
   2C4D E5C540E740D5D6E3       3253
   2C55 40D9C5C1C4E840D6       3253
   2C5D D940E4D5C9E340C3       3253
   2C65 C8C5C3D2               3253
                         2C68  3254 ERMS1B EQU   *-1
   2C69 C1C4C1D7E3C5D940 2C7D  3255 ERMS1  DC    CL21'ADAPTER CHECK ON 3340'
   2C71 C3C8C5C3D240D6D5       3255
   2C79 40F3F3F4F0             3255
                         2C7D  3256 HDG1B  EQU   *-1
   2C7E F0F040404040404040 2CAA 3257       DC    CL45'00       03    04       07    08       11    '
   2C86 40F0F340404040F0       3257
   2C8E F4404040404040404      3257
   2C96 F0F7404040F0F8         3257
   2C9E 4040404040404F1        3257
   2CA6 F140404040             3257
   2CAB F1F2404040404040 2CD3  3258 HDG1   DC    CL41'12       15    16       19    20       23'
   2CB3 40F1F5404040F1         3258
   2CEB F6404040404040C0       3258
   2CC3 F1F9404040F2F0         3258
   2CCB 40404C4040404F2        3258
   2CD3 F3                     3258
                         2CD3  3259 EDMS1B EQU   *-1
   2CD4 F3F3F4F040C6C1C9 2CF8  3260 EDMS1  DC    CL37'3340 FAILED TO EXECUTE A SIO 10 TIMES'
   2CDC D3C5C440E3D640C5       3260
   2CE4 E7C5C3E4E3C540C1       3260
   2CEC 40E2C9D640F1F040       3260
   2CF4 E3C9D4C5E2             3260
                         2CF8  3261 EDMS2B EQU   *-1
   2CF9 E3C8C540C9D5C6D6 2D25  3262 EDMS2  DC    CL45'THE INFORMATION BELOW IS THE 24 BYTE DIAG SNS'
   2D01 D9D4C1E3C9D6D540       3262
   2D09 C2C5D3D6E640C9E2       3262
   2D11 40E3C8C540F2F440       3262
   2D19 C2E8E3C540C4C9C1       3262
   2D21 C740E2D5E2             3262
                         2D25  3263 ERR3B  EQU   *-1
   2D26 C9D5E5C1D3C9C440 2D4E  3264       DC    CL41'INVALID HEADER CARD- CORRECT HEADER CARD '
   2D2E C8C5C1C4C5D940C3       3264
   2D36 C1D9C46C40C3D6D9       3264
   2D3E D9C5C3E340C8C5C1       3264
   2D46 C4C5D940C3C1D9C4       3264
   2D4E 40                     3264
   2D4F C1C5C440D9C5E3D9 2D57  3265 ERR3   DC    CL9'AND RETRY'
   2D57 E8                     3265
                         2D57  3266 ERR8B  EQU   *-1
   2D58 E3C8C540C6C6C140 2D86  3267 ERR8   DC    CL47'THE FFA DECK OR A CPU MODULE HAS TOO MANY BYTES'
   2D60 C4C5C3D240D6D940       3267
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2D68 C140C3D7E440D4D6       3267
   2D70 C4E4D3C540C8C1E2       3267
   2D78 40E3D6D640D4C1D5       3267
   2D80 E840C2E8E3C5E2         3267
                         2D86  3268 ERR9B  EQU   *-1
   2D87 C9D5E5C1D3C9C440 2D86  3269 ERR9   DC    CL48'INVALID CHARACTERS IN DRIVE FIELD OF $DUP OPTION'
   2D8F C3C8C1D9C1C3E3C5       3269
   2D97 D9E240C9D540C4D9       3269
   2D9F C9E5C540C6C9C5D3       3269
   2DA7 C440D6C6405BC4E4       3269
   2DAF D740D6D7E3C9D6D5       3269
                         2DB6  3270 ERR10B EQU   *-1
   2DB7 D4C9E2E2C9D5C740 2DE3  3271       DC    CL45'MISSING UDT OR CPU CARD.  INSERT CARD IN DECK'
   2DBF E4C4E340D6D940C3       3271
   2DC7 D7E440C3C1D9C44B       3271
   2DCF 4040C9D5E2C5D9E3       3271
   2DD7 40C3C1D9C440C9D5       3271
   2DDF 40C4C5C3D2             3271
   2DE4 40C1D5C440C1C4C4 2DF6  3272 ERR10  DC    CL19' AND ADD DECK OVER.'
   2DEC 40C4C5C3D240D6E5       3272
   2DF4 C5D94B                 3272
                         2DF6  3273 ERRE8B EQU   *-1
   2DF7 E3C8C540C6D6D3D3 2E24  3274 ERRE8  DC    CL46'THE FOLLOWING CHAIN IMAGE DATA CARD IS INVALID'
   2DFF D6E6C9D5C740C3C8       3274
   2E07 C1C9D540C9D4C1C7       3274
   2E0F C540C4C1E3C140C3       3274
   2E17 C1D9C440C9E240C9       3274
   2E1F D5E5C1D3C9C4           3274
                         2E24  3275 ERR14B EQU   *-1
   2E25 D5D640D9D6D6D440 2E53  3276       DC    CL47'NO ROOM LEFT ON DATA MODULE - DO A $CMP BEFORE '
   2E2D D3C5C6E340D6D540       3276
   2E35 C4C1E3C140D4D6C4       3276
   2E3D E4D3C5406040C4D6       3276
   2E45 40C1405BC3D4D740       3276
   2E4D C2C5C6D6D9C540         3276
   2E54 C1C4C4C9D5C740D6 2E72  3277 ERR14  DC    CL31'ADDING OR REPPING ANY PROGRAMS.'
   2E5C D940D9C5D7D7C9D5       3277
   2E64 C740C1D5E840D7D9       3277
   2E6C D6C7D9C1D4E24B         3277
                         2E72  3278 ERMS7B EQU   *-1
   2E73 C5D9D9D6D940C9D5 2E98  3279 ERMS7  DC    CL38'ERROR IN MESSAGE, RETYPE AND HIT END  '
   2E7B 40D4C5E2E2C1C7C5       3279
   2E83 6B40D9C5E3E8D7C5       3279
   2E8B 40C1D5C440C8C9E3       3279
   2E93 40C5D5C44040           3279
                         2E98  3280 ERR5B  EQU   *-1
   2E99 C3C1D9C440E2E8D5 2EBA  3281 ERR5   DC    CL34'CARD SYNTAX ERROR - CARD READ WAS:'
   2EA1 E3C1E740C5D9D9D6       3281
   2EA9 D9406040C3C1D9C4       3281
   2EB1 40D9C5C1C440E6C1       3281
   2EB9 E27A                   3281
                         2EBA  3282 ERR6B  EQU   *-1
   2EBB C9D5E5C1D3C9C440 2EE1  3283 ERR6A  DC    CL39'INVALID SEQUENCE # ON CARD - SEQ # XXXX'
   2EC3 E2C5D8E4C5D5C3C5       3283
   2ECB 407B40D6D540C3C1       3283
   2ED3 D9C440604DE2C5D5       3283
   2EDB 407B40E7E7E7E7         3283
   2EE2 40E6C1E240D9C5C1 2EF6  3284 ERR6C  DC    CL21' WAS READ, AND # XXXX'
   2EEA C4B840C1D5C4407B       3284
   2EF2 40E7E7E7E7             3284
   2EF7 4040E6C1E240C5E7 2F04  3285 ERR6   DC    CL14'  WAS EXPECTED'
   2EFF D7C5C3E3C5C4           3285
                         2F04  3286 ERR7B  EQU   *-1
   2F05 C9D5E5C1D3C9C440 2F21  3287 ERR7A  DC    CL29'INVALID ID - ID READ WAS XXXX'
   2F0D C9C4406040C9C440       3287
   2F15 D9C5C1C440E6C1E2       3287
   2F1D 40E7E7E7E7             3287
   2F22 6B40C9C440C5E7D7 2F37  3288 ERR7   DC    CL22', ID EXPECTED WAS XXXX'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2F2A C5C3E3C5C440E6C1       3288
   2F32 E240E7E7E7E7           3288
                         2F37  3289 ERR4B  EQU   *-1
   2F38 C9D5E5C1D3C9C440 2F56  3290 ERR4   DC    CL31'INVALID SYSTEM TEST HEADER CARD'
   2F40 E2E8E2E3C5D440E3       3290
   2F48 C5E2E340C8C5C1C4       3290
   2F50 C5D940C3C1D9C4         3290
                         2F56  3291 SCERRB EQU   *-1
   2F57 E2C3C1D540C5D9D9 2F84  3292 SCERR  DC    CL46'SCAN ERROR- HIT SYSTEM RESET,START, THEN RETRY'
   2F5F D6D96040C8C9E340       3292
   2F67 E2E8E2E3C5D440D9       3292
   2F6F C5E2C5E36BE2E3C1       3292
   2F77 D9E36B40E3C8C5D5       3292
   2F7F 40D9C5E3D9E8           3292
                         2F84  3293 SZERRB EQU   *-1
   2F85 C4C1E3C140D4D6C4 2F9A  3294 SZERRC DC    CL22'DATA MODULE ON DRIVE X'
   2F8D E4D3C540D6D540C4       3294
   2F95 D9C9E5C540E7           3294
   2F9E 40C9E240D5D6E340 2FC8  3295         DC    CL46' IS NOT A 12 M BYTE PACK.  IF YOU WISH TO CONT'
   2FA3 C140F1F240D440C2       3295
   2FAB E8E3C540D7C1C3D2       3295
   2FB3 4B4040C9C640E8D6       3295
   2FBB E440E6C9E2C840E3       3295
   2FC3 D640C3D6D5E3           3295
   2FC9 C9D5E4C56B40D9C5 2FDD  3296 SZERR  DC    CL21'INUE, RESET THE HALT.'
   2FD1 E2C5E340E3C8C540       3296
   2FD9 C8C1D3E34B             3296
                         2FDD  3297 CERRB  EQU   *-1
   2FDE C5D9D9D6D940C9D5 300E  3298         DC    CL49'ERROR IN DCP CONFIGURE RECORD.  RECORD IS PRINTED'
   2FE6 40C4C3D740C3D6D5       3298
   2FEE C6C9C7E4D9C540D9       3298
   2FF6 C5C3D6D9C44B4040       3298
   2FFE D9C5C3D6D9C440C9       3298
   3006 E240D7D9C9D5E3C5       3298
   300E C4                     3298
   300F 40C2C5D3D6E67A   3015  3299 CERR   DC    CL7' BELOW:'
                         3015  3300 KBRDYB EQU   *-1
   3016 D9C5C1C4E86DC4C9 3029  3301 KBRDY  DC    CL20'READY-DISK I/O ON DX'
   301E E2D240C961D640D6       3301
   3026 D540C4E7               3301
                         3029  3302 MSPB   EQU   *-1
   302A E2C5C540D7D9C9D5 3034  3303 MSP    DC    CL11'SEE PRINTER'
   3032 E3C5D9                 3303
                         3034  3304 TERMB  EQU   *-1
   3035 E2C5C3E3C9D6D540 3046  3305 TERM   DC    CL18'SECTION TERMINATED'
   303D E3C5D9D4C9D5C1E3       3305
   3045 C5C4                   3305
                         3046  3306 STRTMB EQU   *-1
   3047 F14B4040E3E4D9D5 3072  3307         DC    CL44'1.  TURN ON SSW TO SELECT INPUT DEVICE.   17'
   304F 40D6D540E2E2E640       3307
   3057 E3D640E2C5D3C5C3       3307
   305F E340C9D5D7E4E340       3307
   3067 C4C5E5C9C3C54B40       3307
   306F 4040F1F7               3307
   3073 6040F3F7F4F14040 309E  3308         DC    CL44'- 3741    18- 1442    1A-MFCU    NONE- 5471 '
   307B 4040F1F86040F1F4       3308
   3083 F4F240404040F1C1       3308
   308B 60D4C6C3E4404040       3308
   3093 40D5D6D5C56040F5       3308
   309B F4F7F140               3308
   309F 40               309F  3309 STRTMS DC     CL1' '
                         309F  3310 STRTAB EQU   *-1
   30A0 F24B4040C4C9E2D2 30CD  3311         DC    CL46'2.  DISK DRIVE 1 WILL BE USED.  IF DRIVE 2 IS '
   30A8 4CC4D9C9E5C540F1       3311
   30B0 40E6C9D3D34CC2C5       3311
   30B8 40E4E2C5C44B4040       3311
   30C0 C9C640C4D9C9E5C5       3311
   30C8 40F240C9E240           3311
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   30CE C4C5E2C9D9C5C440 30E2  3312 STRTA  DC    CL21'DESIRED SET ON SSW22.'
   30D6 E2C5E340D6D540E2       3312
   30DE E2E6F2F246             3312
   30E3 C4C5D3C5E3C5C4   30E9  3313 PGMDEL DC    CL7'DELETED'
                         30EA  3314 ADMSG  EQU   *
   30EA 4040404040404040 3138  3315         DC    79XL1'40'
   30F2 4040404040404040       3315
   30FA 4040404040404040       3315
   3102 4040404040404040       3315
   310A 4040404040404040       3315
   3112 4040404040404040       3315
   311A 4040404040404040       3315
   3122 4040404040404040       3315
   312A 4040404040404040       3315
   3132 40404040404040         3315
                         3139  3316 ADMSGE EQU   *
   3139 C1C4C4C5C46060   313F  3317 ADDED  DC    CL7'ADDED--'
   3140 C4C9C1C7D5D6E2E3 315F  3318 DCPP   DC    CL32'DIAGNOSTIC CONTROL PROG---MOD 12'
   3148 C9C340C3D6D5E3D9       3318
   3150 D6D340D7D9D6C760       3318
   3158 6060D4D6C440F1F2       3318
   3160 0A80             3161  3319 READAD DC    AL2(READIN)
   3162 C4C9E2E2C9D5C740 3175  3320 ERR0   DC    CL20'MISSING CONTROL CARD'
   316A C3D6D5E3D9D6D340       3320
   3172 C3C1D9C4               3320
   3176 40C9D540C5D9D9D6 317E  3321 ERR2   DC    CL9' IN ERROR'
   317E D9                     3321
   317F D5D640E2D7C1C3C5 31A3  3322 ERROR6 DC    CL37'NO SPACE AVAILABLE TO ADD NEW PROGRAM'
   3187 40C1E5C1C9D3C1C2       3322
   318F D3C540E3D640C1C4       3322
   3197 C440D5C5E640D7D9       3322
   319F D6C7D9C1D4             3322
   31A4 40E7E7E740D5D6E3 31B3  3323 MSG02  DC    CL16' XXX NOT ON DISK'
   31AC 40D6D540C4C9E2D2       3323
                         31B3  3324 MENU1A EQU   *-1
   31B4 C5D5E3C5D940D6D5 31D9  3325 MENU1  DC    CL38'ENTER ONE OF THE FOLLOWING OPTIONS:    '
   31BC C540D6C640E3C8C5       3325
   31C4 40C6D6D3D3D6E6C9       3325
   31CC D5C740D6D7E3C9D6       3325
   31D4 D5E27A404040           3325
                         31D9  3326 MENU1B EQU   *-1
   31DA 6150404040404040 3201  3327 MENU11 DC    CL40'/&          - TERMINATE OPERATION -    '
   31E2 4040404040606040E3     3327
   31EA C5D9D4C9D5C1E3C5       3327
   31F2 40D6D7C5D9C1E3C9       3327
   31FA D6D5406040404040       3327
                         3201  3328 MENU1C EQU   *-1
   3202 5BC3D4D740404040 3229  3329 MENU12 DC    CL40'$CMP        - COMPRESS -               '
   320A 4040404040606040C3     3329
   3212 D6D4D7D9C5E2E240       3329
   321A 6040404040404040       3329
   3222 4040404040404040       3329
                         3229  3330 MENU1D EQU   *-1
   322A 5BC3D6D5C6C9C740 3251  3331 MENU13 DC    CL40'$CONFIG     - CONFIGURE -              '
   3232 4040404040606040C3     3331
   323A D6D5C6C9C7E4D9C5       3331
   3242 4060404040404040       3331
   324A 4040404040404040       3331
                         3251  3332 MENU1E EQU   *-1
   3252 5BD3E2E340404040 3279  3333 MENU14 DC    CL40'$LST        - LIST -                   '
   325A 4040404040606040D3     3333
   3262 C9E2E340606040404040   3333
   326A 4040404040404040       3333
   3272 4040404040404C40       3333
                         3279  3334 MENU1F EQU   *-1
   327A 5BC4C5D3E7E7E76B 32A1  3335 MENU15 DC    CL40'$DELXXX,XXX  XXX= ID OF PGM(S) TO DELETE'
   3282 E7E7E74040E7E7E7       3335
   328A 7E40C9C440D6C640       3335
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3292 D7C7D44DE25D40E3      3335
   329A D640C4C5D3C5E3C5      3335
                         32A1 3336 MENU1G EQU   *-1
   32A2 5BC4E4D740C6C6E3 32C9 3337 MENU16 DC    CL40'$DUP FFTT FF= FROM MODULE; TT= TO MODULE'
   32AA E340C6C67E40C6D9      3337
   32B2 D6D440D4D6C4E4D3      3337
   32BA C55E40E3E37E40E3      3337
   32C2 D640D4D6C4E4D3C5      3337
                         32C9 3338 MENU1H EQU   *-1
   32CA 5BD9C5D7E7E7E740 32F1 3339 MENU17 DC    CL40'$REPXXX      XXX= ID OF PROGRAM TO REP  '
   32D2 404040404E7E7E7       3339
   32DA 7E40C9C440D6C640      3339
   32E2 D7D9D6C7D9C1D440      3339
   32EA E3D640D9C5D74040      3339
                         32F1 3340 MENU1I EQU   *-1
   32F2 C4C5D7D9C5E2E240 3319 3341 MENU18 DC    CL40'DEPRESS -END- KEY TO INPUT RESPONSE    '
   32FA 60C5D5C46040D2C5      3341
   3302 E840E3D640C9D5D7      3341
   330A E4E340D9C5E2D7D6      3341
   3312 D5E2C54040404040      3341
                         3319 3342 MENU2B EQU   *-1
   331A C5D5E3C5D940C3D6 333F 3343 MENU2  DC    CL38'ENTER CONFIGURE RECORD, OPTIONS ARE:  '
   3322 D5C6C9C7E4D9C540      3343
   332A D9C5C3D6D9C46640      3343
   3332 D6D7E3C9D6D5E240      3343
   333A C1D9C57A4040          3343
                         333F 3344 MENU2C EQU   *-1
   3340 C3D7E440484E4C40 3367 3345 MEN22  DC    CL40'CPU ...        (EXAMPLE - CPU G,8000,0)  '
   3348 4040404040404DC5      3345
   3350 E7C1D4D7D3C54060      3345
   3358 40C3D7E440C76BF8      3345
   3360 F0F0F06BF05D4040      3345
                         3367 3346 MENU2D EQU   *-1
   3368 E4C4E3404B4B4B40 338F 3347 MEN23  DC    CL40'UDT ...        (EXAMPLE - UDT C1-2,E0,..)'
   3370 404040404040DC5       3347
   3378 E7C1D4D7D3C54060      3347
   3380 40E4C4E340C3F160      3347
   3388 F26BC5F06B4B4E5D      3347
                         338F 3348 MENU2E EQU   *-1
   3390 E4C4E3E74B4B4B40 33B7 3349 MEN24  DC    CL40'UDTX...        (EXAMPLE - UDTX14,51,...)  '
   3398 4040404040404DC5      3349
   33A0 E7C1D4D7D3C54060      3349
   33A8 40E4C4E3E7F1F46B      3349
   33B0 F5F16B4B4B4B5D40      3349
                         33B7 3350 MENU2F EQU   *-1
   33B8 616140C3C8C1C9D5 33E7 3351 MEN25  DC    CL48'// CHAIN 048  CR  // CHAIN 120  DR  // CHAIN STD'
   33C0 40F0F4F84040D6D9      3351
   33C8 4040616140C3C8C1      3351
   33D0 C9D540F1F2F04040      3351
   33D8 D6D94040616140C3      3351
   33E0 C8C1C9D540E2E3C4      3351
                         33E7 3352 MENU2H EQU   *-1
   33E8 E740404040404040 340F 3353 MEN27  DC    CL40'X        (RETURN TO THE MAIN OPTION MENU)'
   33F0 4DD9C5E3E4D9D540      3353
   33F8 E3D640E3C8C540D4      3353
   3400 C1C9D540D6D7E3C9      3353
   3408 D6D540D4C5D5E45D      3353
                         340F 3354 MENU4B EQU   *-1
   3410 C5D5E3C5D940C3C8 3435 3355 MENU4  DC    CL38'ENTER CHAIN IMAGE CARD (48 HEX DIGITS)'
   3418 C1C9D540C9D4C1C7      3355
   3420 C540C3C1D9C4404D      3355
   3428 F4F840C8C5E740C4      3355
   3430 C9C7C9E3E25D          3355
                         3435 3356 MENU5B EQU   *-1
   3436 C5D5E3C5D940D6D5 344D 3357        DC    CL24'ENTER ONE REPLACE RECORD'
   343E C540D9C5D7D3C1C3      3357
   3446 C540D9C5C3D6D9C4      3357
   344E 4040404040404040 345B 3358 REPWHO DC    CL14'              '     $REPXXX IS INSERTED HERE
```


DD62 3340 CE DISK EDITOR MOD 12

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3456 404040404040          3358
                         345B 3359 MENU5D EQU   *-1
   345C E3C8C540C6D6D3D3 3483 3360 MENU53 DC    CL40'THE FOLLOWING ARE EXAMPLES:            '
   3464 D6E6C9D5C740C1D9      3360
   346C C540C5E7C1D4D7D3      3360
   3474 C5E27A4040404040      3360
   347C 4040404040404040      3360
                         3483 3361 MENU5E EQU   *-1
   3484 5C404B4B4B4B4040 34AB 3362 MENU54 DC    CL40'* ....         (ADD THE DESIRED COMMENT)'
   348C 4040404040404040      3362
   3494 C1C4C440E3C8C540      3362
   349C C4C5E2C9D9C5C440      3362
   34A4 C3D6D4D4C5D5E35D      3362
                         34AB 3363 MENU5F EQU   *-1
   34AC D940E7E7E7E740E7 34D3 3364 MENU55 DC    CL40'R XXXX XXXXXX....                      '
   34B4 E7E7E7E7E74B4B4B      3364
   34BC 4B40404040404040      3364
   34C4 4040404040404040      3364
   34CC 4040404040404040      3364
                         34D3 3365 MENU5G EQU   *-1
   34D4 E2E2E640F1C36BF1 34FB 3366 MENU56 DC    CL40'SSW 1C,1D      (TURNS ON SSW 1C AND 1D)'
   34DC C440404040404040      3366
   34E4 4DE3E4D9D5E240D6      3366
   34EC D540E2E2E640F1C3      3366
   34F4 40C1D5C440F1C45D      3366
                         34FB 3367 MENU5H EQU   *-1
   34FC C540404040DC3C1 3523 3368 MENU57 DC    CL40'E    (CAUSES REPS TO BE WRITTEN ON DISK)'
   3504 E4E2C5E240D9C5D7      3368
   350C E240E3D640C2C540      3368
   3514 E6D9C9E3E3C5D540      3368
   351C D6D540C4C9E2D25D      3368
                         3523 3369 MENU5I EQU   *-1
   3524 E740404040404040 354B 3370 MENU58 DC    CL40'X      (RETURN TO THE MAIN OPTION MENU)'
   352C 4DD9C5E3E4D9D540      3370
   3534 E3D640E3C8C540D4      3370
   353C C1C9D540D6D7E3C9      3370
   3544 D6D540D4C5D5E45D      3370
                         354B 3371 REMB   EQU   *-1
   354C C3D6D5C6C9C7E4D9 3571 3372        DC    CL38'CONFIGURE CHANGES COMPLETE ON DISK.    '
   3554 C540C3C8C1D5C7C5      3372
   355C E240C3D6D4D7D3C5      3372
   3564 E3C540D6D540C4C9      3372
   356C E2D24B404040          3372
   3572 40E8D6E440D4E4E2 3599 3373 REM    DC    CL40' YOU MUST IPL CCP TO PUT THEM IN EFFECT.'
   357A E340C9D7D340C4C3      3373
   3582 D740E3D640D7E4E3      3373
   358A 40E3C8C5D440C9D5      3373
   3592 40C5C6C6C5C3E34B      3373
                         3599 3374 REMB2  EQU   *-1
   359A 40E3E8D7C540E740 35C1 3375        DC    CL40' TYPE X AND DEPRESS END TO RETURN TO MAI'
   35A2 C1D5C440C4C5D7D9      3375
   35AA C5E2E240C5D5C440      3375
   35B2 E3D640D9C5E3E4D9      3375
   35BA D540E3D640D4C1C9      3375
   35C2 D540D6D7E3C9D6D5 35D0 3376 REM2   DC    CL15'N OPTION MENU. '
   35CA 40D4C5D5E44B40        3376
                         35D0 3377 MCTLB  EQU   *-1
   35D1 C5D9D9D6D940          3378        DC    CL6'ERROR '
   35D7 C9D540D6D7E3C9D6 35F7 3379 MCTL   DC    CL33'IN OPTION -- RETYPE & HIT END   '
   35DF D54060604DD9C5E3      3379
   35E7 E8D7C5405040C8C9      3379
   35EF E340C5D5C4404040      3379
   35F7 40                    3379
                         35F7 3380 MADDB  EQU   *-1
   35F8 5BC1C4C440C9D5E5 3604 3381        DC    CL13'$ADD INVALID '
   3600 C1D3C9C440            3381
   3606 E6C8C5D540E4E2C9 361D 3382 MADD   DC    CL25'WHEN USING 5471 FOR INPUT'
   360E D5C740F5F4F7F140      3382
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   3615 C6D6D940C9D5D7E4       3382
   361D E3                     3382
                        361D   3383 MENU5C EQU  *-1
   361E C5D5E3C5D940D5C5 3636  3384        DC   CL25'ENTER NEXT REPLACE RECORD'
   3626 E7E340D9C5D7D3C1       3384
   362E C3C540D9C5C3D6D9       3384
   3636 C4                     3384
   3637 4040404040404040 3644  3385 REPWH1 DC   CL14'              '   $REPXXX IS INSERTED HERE
   363F 40404040404040         3385
   3645 F3F7F4F140C9E240 3661  3386 RDMD   DC   CL29'3741 IS NOT IN THE READ MODE.'
   364D D5D6E340C9D540E3       3386
   3655 C8C540D9C5C1C440       3386
   365D D4D6C4C54B             3386
   3662 D7E4E340F3F7F4F1 368E  3387        DC   CL45'PUT 3741 INTO READ MODE (SEE USERS GUIDE '
   366A 40C9D5E3D640D9C5       3387
   3672 C1C440D4D6C4C540       3387
   367A 4DE2C5C540E4E2C5       3387
   3682 D9E240C7E4C9C4C5       3387
   368A 4040404040             3387
   368F C2D3D6C3D240F1F0 36A6  3388 SETUP  DC   CL24'BLOCK 10) AND RESET HALT'
   3697 5D40C1D5C440D9C5       3388
   369F E2C5E340C8C1D3E3       3388
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3390 ***********
                         3391 * EQUATES *
                         3392 ************************************************************************
                         3393
                         3393
                    007F 3394 MSGBGN EQU   X'7F'
                    345B 3395 MENU51 EQU   REPWHO
                    0008 3396 ARR    EQU   X'08'
                    0216 3397 LINK   EQU   X'216'
                    021A 3398 PRINT  EQU   X'21A'
                    0001 3399 XR1    EQU   X'01'
                    0002 3400 XR2    EQU   X'02'
                    0222 3401 HALT   EQU   X'222'
                    020A 3402 SBYTE2 EQU   X'020A'
                    0B60 3403 DBYTE0 EQU   DGSNSB
                    0B61 3404 DBYTE1 EQU   DGSNSB+1
                    0B62 3405 DBYTE2 EQU   DGSNSB+2
                    0B67 3406 DBYTE7 EQU   DGSNSB+7
                    0002 3407 TRKCC  EQU   X'02'
                    0001 3408 OPINCP EQU   X'01'
                    0212 3409 TEST   EQU   X'212'
                    021E 3410 UNPACK EQU   X'21E'
                    0226 3411 PACK   EQU   X'226'
                    022A 3412 LOAD   EQU   X'22A'
                    00C4 3413 DDDR   EQU   X'C4'
                    00C6 3414 DDCR   EQU   X'C6'
                    020A 3415 SWITCH EQU   X'020A'
                    3FFF 3416 X3FFF  EQU   X'3FFF'
                    3900 3417 CARD2A EQU   X'3900'
                    00C0 3418 IAR1   EQU   X'C0'
                    0018 3419 SIOI   EQU   X'18'
                    0879 3420 CRTFLG EQU   X'879'
                    0001 3421 SSW07  EQU   X'01'
                    0020 3422 SSW22  EQU   X'20'
                    0010 3423 SSW23  EQU   X'10'
                    0008 3424 SSW24  EQU   X'08'
                    0080 3425 SSW18  EQU   X'80'
                    0001 3426 SSW17  EQU   X'01'
                    0020 3427 SSW1A  EQU   X'20'
                    0010 3428 SSW1B  EQU   X'10'
                    0001 3429 SSW2F  EQU   X'01'
                    00C0 3430 DR1    EQU   X'C0'
                    00C8 3431 DR2    EQU   X'C8'
                    00D0 3432 DR3    EQU   X'D0'
                    00D8 3433 DR4    EQU   X'D8'
                    0020 3434 P1IAR  EQU   X'20'
                    0010 3435 IAR    EQU   16
                    0080 3436 SNSDR1 EQU   X'80'
                    0040 3437 SNSDR2 EQU   X'40'
                    0020 3438 SNSDR3 EQU   X'20'
                    0010 3439 SNSDR4 EQU   X'10'
                    0A07 3440 OPUDT  EQU   X'A07'   SECTION PREFACE UNIT TABLE-3
                    022F 3441 QTAB   EQU   X'22F'   FIRST BYTE OF UDT TABLE-3
                    0232 3442 UTAB   EQU   X'232'   FIRST BYTE OF UDT TABLE
                    0211 3443 RPFX   EQU   X'211'
                    0080 3444 BIT0   EQU   X'80'
                    0040 3445 BIT1   EQU   X'40'
                    0020 3446 BIT2   EQU   X'20'
                    0010 3447 BIT3   EQU   X'10'
                    0208 3448 SBYTE0 EQU   X'208'
                    020C 3449 SBYTE4 EQU   X'20C'
                    0A02 3450 SPFLGS EQU   X'A02'   SECTION PREFACE FLAGS
                    0003 3451 H1     EQU   X'03'    HALT DISPLAY 1
                    003F 3452 HA     EQU   X'3F'    HALT DISPLAY A
                    003B 3453 HH     EQU   X'3B'    HALT DISPLAY H
                    0000 3454 L1     EQU   00
                    0028 3455 L2     EQU   40
                    0050 3456 L3     EQU   80
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         0078 3457 L4      EQU   120
                         00A0 3458 L5      EQU   160
                         00C8 3459 L6      EQU   200
                         00F0 3460 L7      EQU   240
                         0118 3461 L8      EQU   280
                         0140 3462 L9      EQU   320
                         0168 3463 L10     EQU   360
                         0190 3464 L11     EQU   400
                         01B8 3465 L12     EQU   440
                         0A6F 3466 IDLOC   EQU   SAVID-5
                         0900 3467 X900    EQU   X'900'
                         28CD 3468 WRT#    EQU   DDCFT
                         2BF2 3469 DAT     EQU   TSTN
                         087C 3470 X87C    EQU   X'87C'
                         0880 3471 X880    EQU   X'880'
                         0004 3472 SSW05   EQU   X'04'
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3474 ************************************************************
                         3475 *
                         3476 *        E N D   C A R D       R O U T I N E
                         3477 *
                         3478 ************************************************************
   36A7 40               36A7 3479 ENDROU DC    CL1' '
   36A8 1C 16 0016 FF    3480      MVC   22(23),LENGTH-ENDROU+127(,XR1)
                                                 SET UP PROGRAM RESTART
                         3481 *
   36AD 4C 01 D8 022F    3482      MVC   LM@-ENDROU+128(2,XR1),X'22F'
                         3483 *                  SET MESSAGE ADDRESS IN PRINT LINKAGE
                         3484      TBN   SPFLGS,BIT0       BRANCH IF NO UDT ENTRIES
   36B2 38 80 0A02       3485      JT    LDEND
   36B6 F2 10 3F         3486      LA    QPUDT,XR2         POINT XR2 AT SECTION PREFACE UDT(-3)
   36B9 C2 02 0A07       3487 UFIND1 LA  QTAB,XR1          POINT XR1 AT DCP UNIT TABLE (-3)
   36BD C2 01 022F       3488      LA    3(,XR2),XR2       INCREMENT SPUT POINTER +3
   36C1 E2 02 03         3489 UFIND2 LA  3(,XR1),XR1       INCREMENT POINTER BY THREE
   36C4 D2 01 03         3490      CLC   0(1,XR1),0(,XR2)  BRANCH IF NOT PROPER UDT
   36C7 6D 00 00 00      3491      JNE   UFIND4
   36CB F2 01 15         3492      MVC   2(1,XR2),2(,XR1)  LOAD SECTION PREFACE OPTION
   36CE 9C 00 02 02      3493      MNN   1(,XR2),1(,XR1)     BITS
   36D2 98 03 01 01      3494      SBN   1(,XR2),BIT2      SET ASSIGNED FLAG
   36D6 BA 20 01         3495 UFIND3 TBN 1(,XR2),BIT3      (UFIND3 CHECK)
   36D9 B8 10 01         3496      BF    X900+UFIND1-ENDROU  IF NOT LAST ENTRY, GO LOAD NEXT
   36DC C0 90 0916       3497      J     LDEND             OTHERWISE - GO START SECTION
   36E0 F2 87 15         3498 UFIND4 TBN 1(,XR1),BIT3      CHECK FOR LAST DCP ENTRY
   36E3 78 10 01         3499      BF    X900+UFIND2-ENDROU  CONTINUE IF NOT LAST ENTRY
   36E6 C0 90 091D       3500      TBF   1(,XR2),BIT1      SKIP ERROR HALT IF REQUIRED FLAG
   36EA B9 40 01         3501      BT    X900+UFIND3-ENDROU  NOT ON
   36ED C0 10 0932       3502 HLT1 HPL   H1,HH           *UDT CANNOT BE SATISFIED
   36F1 F0 3B 03         3503      B     X900+UFIND3-ENDROU  BYPASS ERROR IF HALT RESET
   36F4 C0 87 0932       3504 LDEND B    PRINT             TO PRINT HEADING
   36F8 C0 87 021A       3505      DC    XL1'47'
   36FC 47               3506      DC    IL1'14'
   36FD 0E               3507 LM@  DC    AL2(*-*)
   36FE 0000             3508      DC    XL2'FF00'
   3700 FF00             3509      TBF   SEYTEC,SSW07
   3702 39 01 0208       3510      TBF   X'1FD',X'08'
   3706 39 08 01FD       3511      JF    *+06
   370A F2 90 03         3512 HLTA HPL   HA,HH
   370D F0 3B 3F         0A03 3513 USING RNUM,XR2
                         3514      LA    RNUM,XR2          SAVE FIRST ROUTINE PREFIX AND
   3710 C2 02 0A03       3515      L     4(,XR2),XR1
   3714 B5 01 04         3516      MVC   RNUM(1,XR2),0(,XR1)  LOAD CURRENT ROUTINE NUMBER
   3717 9C 00 00 00      3517      MVC   RPFX(4),3(,XR1)
   371B 1C 03 0211 03    3518      B     TEST              CHECK DATA SWITCHES
   3720 C0 87 0212       3519      B     4(,XR1)           START DIAGNUSTIC SECTION
   3724 D0 87 04         3727 3520 LENGTH EQU  *
```

DD62 3340 CE DISK EDITOR MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3522 ********************************************************************************
                         3523 *     IF FLAG OCCURS ON THIS ORG YOU HAVE EXPANDED INTO X'3900'.
                         3524 *     3900-39FF IS THE BUFFER FOR SECOND CARD FOR 2560 AND 1442.
                         3525 *     3A00- ON  IS RESERVED FOR USE BY THE MLTA CONFIGURATOR PROGRAM
                         3526 *     'FE7'.
   7E27                  3527          ORG   X'8000'-X'3900'+*
                         3528 *
                         3529 *
                         3530 *
                         3531 *
   4800                  3532          ORG   X'4800'
                    4800 3533 DDDF     EQU   *             WORK FIELD
   4800                 77FF 3534          DS    48CL256
                    4900 3535 DDDF1    EQU   DDDF+256
```


DD62 3340 CE DISK EDITOR MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         3537          TREP
                         3538          TREP
                         3539          TREP
                         3540          TREP
                         3541          TREP
                         3542          TREP
                         3543          TREP
                         3544          TREP
                         3545          TREP
                         3546          TREP
                         3547          TREP
                         3548          TREP
                         3549          TREP
                         3550 *                JEB
                    0B9D 3551          END   SETDSK
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
AA07	A	004	0BF2	0111	0108 0186 0233
AA18	A	004	1F7E	2040	2038
AA19	A	003	1F75	2037	2043
AA20	A	004	1F97	2046	2058
ACTO	A	001	2B80	3205	0565 1634 1732 1756 2386
ADDCPU	A	001	116F	0630	0749
ADDED	A	007	313F	3317	0264
ADDFFA	A	001	116B	0627	0299
ADDFLG	A	001	2AAD	3134	0101* 0262* 0775* 1106* 2871
ADDR	A	002	2AB2	3137	1956* 1964 2033* 2060 2507* 2615 2846* 2849 2864* 2868
ADDR1	A	002	1F58	2025	2032* 2059
ADDTST	A	001	0CA5	0199	0164
ADMSG	A	001	30EA	3314	0264* 0265* 0266* 0569 0570 0759 0762* 0763* 0764* 0767 0927* 0928* 1076* 1077* 1078* 1079* 1083 1272*
ADMSGE	A	001	3139	3316	0767 0768 1083 1084
ARR	C	001	0008	3396	0042 0047 0705 1589 1688 2027 2094 2150 2202 2249 2288 2321 2366 2449 2506 2625 2684 2695 2768 2836 3036 3065 3079 3104
AST	A	003	2275	2362	2389
ASTRK	A	001	12F1	0788	0764
BB1	A	004	1873	1344	1331
BE55	A	004	27B1	2866	2865*
BIT0	C	001	0080	3444	3484
BIT1	C	001	0040	3445	3500
BIT2	C	001	0020	3446	3494
BIT3	C	001	0010	3447	3495 3498
BLNK	A	006	0B09	0034	0282 0789 0803 2717
BRTRY1	A	006	24A4	2582	2810
BUF14	A	002	27F2	2887	2888 3059
CALCAD	A	004	19C3	1469	1432
CAL12	A	001	1A87	1527	1470
CARD1@	A	002	27F0	2886	2962 3027 3054
CARD2@	A	002	27F2	2888	3001
CARD2A	C	001	3900	3417	3062
CARSAV	A	001	2AB3	3138	1566* 1580
CDEXIT	A	004	292A	2993	2987
CD1OR2	A	001	2AAC	3133	0394 2029 2842* 2869* 2875 2961* 3032* 3055* 3060*
CERR	A	007	3015	3299	1995 1996
CERRB	A	001	2FDD	3297	1995
CFGEND	A	004	1F28	1988	1876 1878
CFGERR	A	004	1F30	1993	1885
CFGPGM	A	001	1D97	1836	0207
CFIGFG	A	001	2AAE	3135	0899 1048 1837* 1988*
CFRT	A	004	1DBD	1848	1049
CFRTRN	A	004	1F00	1972	0900
CFRT3	A	004	1DED	1873	1977 1986 2000
CHK1	A	004	24D1	2595	2578
CHNERR	A	004	15AD	1040	0847 0858
CHNID	A	008	2AF6	3165	0374 1880
CKER	A	002	2AC4	3147	1568
CKM	A	004	0DED	0313	0306 0310
CK18	A	004	2781	2853	2845
CLE55	A	004	27A7	2864	2860
CLI1	A	004	249D	2579	2546*
CLI2	A	003	0D95	0289	0286* 0288* 0291
CLW	A	002	2ABC	3143	1492* 1499
CL3	A	002	2AB8	3141	1472* 1475 1529* 1532
CMCNT1	A	005	1CB2	1743	1730
CMCNT2	A	006	20F8	2162	2158
CMCNT3	A	006	2108	2166	2161
CMCNT4	A	004	1D70	1810	1802 1818
CMID	A	001	2BD5	3226	0728 0730 0732
CMIDLC	A	005	2B66	3195	0674 0683 0715* 0746*
CMLOOP	A	006	1F9B	2047	2052
CMPCON	A	002	2805	3170	0214
CMPPGM	A	001	1C69	1717	0215
CMPRS1	A	004	1F59	2027	0409 0649 0952

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
COMPXT	A	004	2028	2083	2027* 2068 2072
CONTA4	A	004	209A	2126	2131
CONTA5	A	004	208C	2123	2111
CONTA6	A	004	2082	2132	2128
CONTA7	A	004	0EB3	0383	0347
CONTA8	A	006	21F1	2271	2259 2265
CONTA9	A	004	1311	0797	0790
CONTB2	A	001	0E07	0327	0304
CONTC3	A	004	10FE	0580	0527 0548
CONTC5	A	006	0FE3	0493	0486
CONTC9	A	006	12AA	0759	0509 0592
CONTD9	A	005	10E6	0573	0561
CONTE1	A	005	0DD2	0305	0301
CONTE2	A	003	0E70	C363	0355
CONTE5	A	004	2331	2427	2413
CONTE6	A	001	0DAA	0295	0281 0283
CONTF3	A	004	175C	1230	1209 1213
CONTG1	A	005	123C	0717	0713
CONTG2	A	004	1258	0725	0718
CONTG3	A	004	129E	0749	0744
CONTG4	A	006	11EC	0674	0667
CONTI1	A	003	2883	2960	2947
CONVRT	A	004	202E	2094	0360 1229
CONVTR	A	004	20B6	2134	2094*
COUNT	A	002	2AC6	3148	1474* 1476* 1484* 1489* 1492 1498* 1504* 1508 1513* 1516* 1531* 1533* 1538* 1543* 1546
CPCNT1	A	004	1FEB	2067	2030
CPUDFG	A	001	2A9C	3120	0529 0874 0882* 0887*
CPUFG	A	001	2AAA	3131	0268 0517 0628* 0666 0671* 0735* 0751* 0992 1010 1025
CPUIDZ	A	004	2AEE	3164	0372 0566
CPUPG	A	001	121D	0704	0269 0313
CPUPGR	A	004	12A6	0752	0705*
CPW	A	002	2AC0	3145	1508* 1547* 1566 1568
CRTFLG	C	001	0879	3420	
CTLREC	A	004	28F9	2980	2976
CTR1	A	001	2B0E	3174	2704* 2720*
CTR2	A	001	2B0F	3175	2705* 2715*
COH027	A	005	2B57	3192	1397 1424 1449
COH048	A	005	2B6B	3196	0568 0746
COH2R1	A	005	2B5C	3193	1415
C1H0R1	A	005	2B70	3197	0715
C2H0R1	A	005	2B4D	3190	0601 1627 1721 2373
C3H0	A	005	2B43	3188	0541 0546 1145
C3H15	A	005	2B52	3191	0532 0534 0809 0889 0936 1840 1841 1895
C3H161	A	005	2B2A	3183	2289 2323
C3H162	A	005	2B2F	3184	0578 1679
C3H163	A	005	2B34	3185	0526
C3H164	A	005	2B39	3186	0547 1118
C3H165	A	005	2B3E	3187	0552
C3H172	A	005	2B25	3182	0303 0525
C33H18	A	004	2B74	3198	2521
C4H0R1	A	005	2B48	3189	0600 1396 1406 2302 3199
DADD	A	004	2AA7	3129	
DAT	A	002	2BF2	3469	2904* 2905 2907 2912 2914 2916 2917
DBYTE0	A	001	0B60	3403	2802 2807
DBYTE1	A	001	0B61	3404	2803 2808
DBYTE2	A	001	0B62	3405	1388 1394 2809
DBYTE7	A	001	0B67	3406	2628 2634
DCPCD1	A	004	1319	0800	0368 1215
DCPCD2	A	004	1383	0834	0375 1881
DCPCD3	A	003	13F5	0872	0371 1887
DCPCD4	A	004	141D	0885	0373 1883
DCPCN2	A	004	1440	0899	0876 0879
DCPCN4	A	005	1406	0878	0873
DCPCT1	A	001	C0F1	0314	0958
DCPERR	A	004	1599	1029	0530

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
DCPFG	A	001	2AA0	3124	0263 0263* 0367 0515 0801 0901 0924* 0950* 1127* 1140 1212 1257 1260*
DCPID	A	003	2B1C	3180	0913 1115 1125
DCPP	A	032	315F	3318	0926 0928
DDCF	A	010	2BAF	3213	0432* 0469* 0496* 0553* 0575* 0580* 0670* 0675* 0938* 1119* 1259* 1277* 1290* 1416* 1425* 1440* 1695* 1723* 1766* 1783* 2374* 2402* 2405* 2429*
DDCFB	A	001	2BA6	3212	0436 0474 0503 0558 0591 0680 0943 1123 1281 1300 1420 1429 1444 1701 1727 1770 1788 2411 2433 3214
DDCFE	A	001	237E	2492	2519* 2521 2572 2586
DDCFM	A	001	2BAB	3214	0303* 0319* 0442 0455 0526* 0547* 0552* 0578* 0601* 0669* 0674* 0936* 0937* 1118* 1415* 1424* 1627* 1679* 1704 1721* 1739 1744 1776 2373* 2416
DDCFR	A	010	2BB9	3216	1745* 1750* 2290* 2324*
DDCFRB	A	001	2BB0	3215	1754 2294 2331 3217
DDCFRM	A	001	2BB5	3217	1744* 1748 2289* 2323*
DDCFS	A	010	2BC3	3219	0810* 0890* 1897* 2159* 2162* 2163* 2166 2206 2208*
DDCFSB	A	001	2BBA	3218	0814 0897 1902 2171 2215 3220
DDCFSM	A	001	2BEF	3220	0800* 0809* 0834* 0881* 0886* 0889* 1214* 1895* 1896* 2154* 2179 2204* 2205* 2224 2228
DDCFT	A	010	2BCD	3222	1146* 2166* 2206* 2209* 3468
DDCFTB	A	001	2BC4	3221	1252 2176 2221 3223
DDCFTM	A	001	2BC9	3223	1145* 1149 1255 1265 1322* 1780 2155* 2181 2226
DDCFX	A	001	2198	2246	2253* 2256 2258* 2261 2263* 2264* 2267* 2268* 2269* 2272
DDCR	C	001	00C6	3414	2557* 2606* 2651* 2657*
DDDF	A	001	4800	3533	0043* 0044 0044* 0103 0338 0435 0470* 0473 0493* 0494* 0502 0551 0557 0585* 0586* 0590 0602* 0603* 0632 0679 0722 0770 0942 0946 1108 1122 1169 1251 1272 1275* 1280 1293 1294* 1295* 1299 1320 1419 1428 1433* 1434* 1437* 1438* 1443 1580* 1581* 1696 1700 1719 1726 1753 1769 1787 1838 2170 2175 2214 2220 2293 2296 2298 2326* 2330 2383* 2384 2384* 2386* 2387* 2389 2391* 2392 2392* 2410 2432 3535
DDDF1	A	001	4900	3535	0497* 0498 0498* 1293*
DDDR	C	001	00C4	3413	2556* 2573* 2605* 2647 2648* 2654* 2658* 2686 2687* 2692*
DDO	A	002	2AD6	3155	0743
DE	A	004	0CEF	0220	0217
DEFTKR	A	004	2549	2636	2625*
DEFTRK	A	004	2523	2625	2804
DEL	A	002	2BF6	3246	0208
DELFG	A	001	2BF0	3243	1075* 1091* 1112 1283 1314
DELPGM	A	001	1608	1090	0211
DEL1	A	001	15E1	1073	1284
DEL2	A	003	1601	1086	1315
DEST	A	002	2063	2109	2101* 2117* 2127
DFLAG	A	001	2A9F	3123	0280* 0308* 0346 0383 0388 0405
DGPRT@	A	002	2670	2736	
DGSNS@	A	002	25DE	2680	2687
DGSNSB	A	001	0B60	0037	2680 2698 3403 3404 3405 3406
DGSNS1	A	024	0B77	0038	2062* 2063
DGSNS2	A	086	0E5F	0036	2735 2736
DGS2B	A	001	0B09	0035	2699 2735
DIV02	A	006	1A48	1503	1501 1506
DIV12	A	006	1A0E	1488	1486 1491
DORD	A	003	2855	2924	2911
DOREAD	A	004	2858	2925	3063
DOSIO	A	004	2881	2942	2938 2959 3018
DRIVE#	A	001	234E	2447	1385* 1391* 2211* 2217* 2395 2452* 2456* 2531 2532 2533 2535 2536 2538 2539 2551 2571 2598 2600 2601 2602 2604 2638 2639 2642 2688
DRTRN1	A	001	250C	2610	2663
DRTRN2	A	001	246E	2562	2667
DRTRN3	A	001	2492	2575	2666
DR1	C	001	00C0	3430	1363 2452
DR2	C	001	00C8	3431	1366 2456
DR3	C	001	00D0	3432	1369
DR4	C	001	00D8	3433	1372
DSKDUP	A	004	1877	1355	0219

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
DTAHDR	A	004	2B20	3181	0305
DU	A	002	2BF8	3247	0216
DUPERR	A	004	19B5	1459	1360 1374 1383
DUPROC	A	006	18D2	1382	1377
DV02	A	006	1ABF	1542	1540 1545
DX14	A	004	2A14	3066	3073
D0	A	004	2AD4	3154	0271 0276 0737 1007 1796
D1	A	001	2AD8	3157	0330 0351 0403 0633 0648 0721 0795 1637 1736 1773 1803
D120	A	003	2AE1	3159	0846
D48	A	003	2ADE	3158	0844 1811
D5471	A	004	2A4D	3087	3085
EDIT	A	001	0A00	0008	
EDITA	A	001	0B99	0054	0017
EDITAA	A	004	0BCB	0099	0085 0197 0971 0980 1038 1087 1204 1302 1317 1457 1465 1825 1989 2003 2822
EDMS1	A	037	2CF8	3260	2755 2756
EDMS1B	A	001	2CD3	3259	2755
EDMS2	A	045	2D25	3262	2725 2726
EDMS2E	A	001	2CF8	3261	2725
EE1	A	004	267D	2742	2800
EE2	A	004	2699	2753	2583 2627
ENCMP1	A	004	1D21	1783	1757
ENDROU	A	001	36A7	3479	0427 0427* 1245 1245* 3480 3482* 3496 3499 3501 3503
ENDRP	A	003	1776	1244	1207 1323
END1	A	001	232A	2423	2377
END2	A	001	11D4	0665	0639
END3	A	004	12A2	0751	0708 0731 0733
EOJCHK	A	004	290C	2985	2971 2981 2989
EOJ1	A	003	2927	2992	2941 2998
ERMSG	A	036	2C68	3253	2774* 2777* 2780* 2783* 2786 2787
ERMSGB	A	001	2C44	3252	2786
ERMS1	A	021	2C7D	3255	2744 2745
ERMS1B	A	001	2C68	3254	2744
ERMS7	A	038	2E98	3279	1327 1328
ERMS7B	A	001	2E72	3278	1327
ERR	A	004	29A7	3036	3026 3066
ERREB	A	046	2E24	3274	1042 1043
ERREBB	A	001	2DF6	3273	1042
ERRGRC	A	035	29E7	3048	3014 3042
ERROR6	A	037	31A3	3322	
ERR0	A	020	3175	3320	0182
ERR1	A	004	29C1	3046	3036* 3037*
ERR10	A	019	2DF6	3272	1031 1032
ERR10B	A	001	2DB6	3270	1031
ERR11	A	004	296A	3010	2945 2968 3007
ERR14	A	031	2E72	3277	2817 2818
ERR14B	A	001	2E24	3275	2817
ERR2	A	009	317F	3321	0229
ERR3	A	009	2D57	3265	0966 0967
ERR3B	A	001	2D25	3263	0966
ERR4	A	031	2F56	3290	0975 0976
ERR4B	A	001	2F37	3289	0975
ERR5	A	034	2EBA	3281	0612 0613 0984 0985 1335 1336
ERR5B	A	001	2E98	3280	0612 0984 1335
ERR6	A	014	2F04	3285	1001 1002
ERR6A	A	039	2EE1	3283	0996*
ERR6B	A	001	2EBA	3282	1001
ERR6C	A	021	2EF6	3284	0997*
ERR7	A	022	2F37	3288	1015* 1019 1020
ERR7A	A	029	2F21	3287	1014*
ERR7B	A	001	2F04	3286	1019
ERR8	A	047	2D86	3267	0689 0690
ERR8B	A	001	2D57	3266	0689
ERR9	A	048	2DB6	3269	1461 1462
ERR9B	A	001	2D86	3268	1461
EXITA	A	002	28F4	3245	

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CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
FADD	A	001	2AA3	3128	0176* 0275* 0710* 0918 0921* 2983*
FAS	A	003	2269	2359	1792 2296
FASINB	A	001	2267	2358	0318 0540 1159 1264 1265* 1401* 1404 1407 1790* 1792* 2302* 2303* 2304* 2361
FASINF	A	001	2272	2360	0317 0506* 0507* 1263* 1791* 2298* 2301* 2326 2376 2397
FASINM	A	001	226F	2361	1798 1801 1806 1810* 1814 1816
FASWR	A	004	1020	0515	0452 0685
FFA	A	003	2B16	3178	0298 0519
FFALOC	A	005	2B61	3194	0577 0669
FFB	A	003	2B19	3179	0300 0521
FIGCON	A	002	2B03	3169	0206
FIN	A	004	292E	2994	2978 2999 3009
FINCAL	A	006	1AF0	1566	1522
FLAG	A	001	1666	1131	1134
FLAGS	A	001	0C67	0171	0166 0919
FLAG1	A	001	17C5	1270	1273
FLAG2	A	001	0F99	0464	0467
FLAG3	A	001	0FBB	0477	0480
FRDRV#	A	001	2BEE	3241	1357* 1382 1385 2211
FRDTRK	A	001	25C6	2669	2635
FSTCPU	A	001	2AAB	3132	0560 0711 0712* 0745*
FUNBT1	A	002	2983	3021	2942
F3741	A	001	2AA2	3127	0102* 0425* 2937 2940* 2970 2974* 2979* 2980 2982* 2990*
GET1	A	004	0C42	0151	0153 0178 0225 0250
GET2	A	004	0D23	0257	0105 0259 1008
GET3	A	004	12CF	0771	0760 0773
GET4	A	004	14DD	0951	0954
GET5	A	004	117F	0636	0663 0723 0994 1012 1027
GET7	A	004	1385	0850	0845 0867
GOOUT	A	004	2771	2848	2847*
HA	C	001	003F	3452	3512
HALT	C	001	0222	3401	0096 0184 0195 0231 0618 0693 0969 0978 0989 1004 1022 1035 1050 1059 1341 1596 2001 2749 2759 2792 2820 2957 3016 3044
HALT1	A	001	26B1	2767	2559 2607 2649 2655
HALT1A	A	004	26BF	2772	2813
HALT1R	A	004	26FF	2795	2768* 2769* 2812*
HALT2	A	001	2703	2797	2566 2596 2613
HARSAV	A	001	2AB4	3139	1567* 1571* 1573* 1574* 1578* 1581
HDG1	A	041	2CD3	3258	2730 2731
HDG1B	A	001	2C7D	3256	2730
HDRDCP	A	004	146E	0921	0914
HERE	A	004	1E06	1571	1569
HERE1	A	004	1E1E	1578	1576
HH	C	001	0038	3453	3502 3512
HLTA	A	003	370D	3512	
HLT1	A	003	36F1	3502	
HLW	A	002	2ABE	3144	1493* 1521
HL3	A	002	2ABA	3142	1473* 1479 1480 1530* 1539 1542* 1544 1553
HPW	A	002	2AC2	3146	1514* 1515* 1521* 1552* 1555* 1573 1575
HT	C	001	0003	3451	3502
IAR	C	001	0010	3435	
IAR1	C	001	00C0	3418	
ICTR	A	001	2BEA	3237	0842* 0849* 0866* 0930* 0933* 0945* 0948* 1355* 1376* 2511* 2582* 2626*
IDLOC	A	096	0A6F	3466	0483 0484 0490 0519 0521 0598 0599
INCCL	A	006	21E1	2267	2262
INCHD	A	004	21CD	2261	2257
INVCD	A	004	1521	0982	0381 0641
INVCD1	A	004	1850	1325	1218 1220 1222 1225 1227
INVHDR	A	004	14F9	0964	0917 0920
INVID	A	00[illegible]	1572	1014	0401 0646 0792
INVSCD	A	004	150D	0973	0285 0290
INVSEQ	A	005	1541	0996	0277 0399 0644 0739 0794
KBRDY	A	020	3029	3301	0149 0150 2453* 2457*
KBRDYB	A	001	3015	3300	0149
KCTR	A	001	2BEC	3239	1628* 1674*
LCTR	A	001	2BEB	3238	0856* 0860* 1631* 1647* 1652 1670

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CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
LDEND	A	004	36F8	3504	3485 3497
LD1442	A	004	29E8	3054	2854
LD3741	A	001	286D	2936	2856
LD5471	A	001	27F6	2898	2862
LENCT2	A	002	297F	3019	2963 3002
LENGTH	A	001	3727	3520	0427 0427 0427* 1245 1245 1245* 3480
LINK	C	001	0216	3397	0193
LINKM	A	001	0C8F	0188	0168 0696 2504 2751 2761
LINKM@	A	002	239B	2504	2812
LM@	A	002	36FF	3507	3482*
LOAD	C	001	022A	3412	
LOOP1	A	004	0E32	0341	0336 0344 0352 0418 0621 0903 0993 1011 1026 1052
LOOP10	A	006	187B	1357	1380
LOOP11	A	004	2154	2208	2229
LOOP12	A	004	1B97	1630	1665 1681
LOOP13	A	004	261F	2705	2721
LOOP14	A	004	2623	2706	2716
LOOP16	A	004	1CC1	1747	1760 1781
LOOP17	A	006	20E2	2157	2184
LOOP18	A	004	1052	1798	1808
LOOP19	A	004	149A	0931	0934
LOOP2	A	004	0E2A	0338	0445
LOOP21	A	003	1E60	1916	1911 1920
LOOP22	A	003	1E7F	1927	1929
LOOP23	A	003	1E90	1933	1937
LOOP24	A	003	1EB1	1944	1950 1966
LOOP25	A	004	1E42	1906	1913
LOOP3	A	004	14C6	0947	0949
LOOP30	A	003	13C5	0857	0861
LOOP4	A	004	0F19	0413	0361 0369 0408 0798
LOOP5	A	004	1C7F	1723	1741
LOOP6	A	004	169F	1148	1151
LOOP7	A	006	0D8F	0288	0292
LOOP8	A	006	22EB	2399	2419
LOOP9	A	003	1364	0823	0828
LOP12A	A	004	1B9B	1631	1614*
LSCNT1	A	004	1B9F	1633	1640 1650
LSCNT2	A	004	1BDA	1652	1615* 1635
LSCNT3	A	004	1BEF	1658	1648
LSPGM1	A	004	1B6D	1618	1611 1613
LSPGM2	A	004	1B93	1628	
LSPG1A	A	004	1B7B	1621	1616*
LSPG1B	A	004	1B7F	1623	1617*
LSTCON	A	004	1C03	1667	1653
LSTDCD	A	004	2ADA	3156	0307* 0390
LSTPGM	A	001	1B4F	1609	0213
LSTRD	A	004	1C35	1688	1633
LSTRDR	A	004	1C46	1692	1688* 1690 1705
LSTSCN	A	001	2AA1	3126	2394* 2406* 2418
LWRITE	A	004	0F33	0424	0378 0386 0393 0395 0411
LWRT	A	001	2A9E	3122	0424* 0444 1105* 1656* 1663 1664*
L1	C	001	0000	3454	
L10	C	001	0168	3463	
L11	C	001	0190	3464	
L12	C	001	01B8	3465	
L2	C	001	0028	3455	
L3	C	001	0050	3456	
L4	C	001	0078	3457	
L5	C	001	00A0	3458	
L6	C	001	00C8	3459	
L7	C	001	00F0	3460	
L8	C	001	0118	3461	
L9	C	001	0140	3462	
MADD	A	025	361D	3382	0247 0248
MADDB	A	001	35F7	3380	0247
MAXPGM	A	003	2AE4	3160	1626 1720

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
MCTL	A	033	35F7	3379	0174 0175 0222 0223
MCTLB	A	001	35D0	3377	0174 0222
MCTR	A	001	2BED	3240	1625* 1678* 1689* 1694*
ME	A	002	2AE8	3162	0385
MENU1	A	038	31D9	3325	0113 0114
MENU1A	A	001	31B3	3324	0113
MENU1B	A	001	31D9	3326	0117
MENU1C	A	001	3201	3328	0121
MENU1D	A	001	3229	3330	0125
MENU1E	A	001	3251	3332	0129
MENU1F	A	001	3279	3334	0133
MENU1G	A	001	32A1	3336	0137
MENU1H	A	001	32C9	3338	0141
MENU1I	A	001	32F1	3340	0145
MENU11	A	040	3201	3327	0117 0118
MENU12	A	040	3229	3329	0121 0122
MENU13	A	040	3251	3331	0125 0126
MENU14	A	040	3279	3333	0129 0130
MENU15	A	040	32A1	3335	0133 0134
MENU16	A	040	32C9	3337	0137 0138
MENU17	A	040	32F1	3339	0141 0142
MENU18	A	040	3319	3341	0145 0146
MENU2	A	038	333F	3343	1850 1851
MENU2B	A	001	3319	3342	1850
MENU2C	A	001	333F	3344	1854
MENU2D	A	001	3367	3346	1858
MENU2E	A	001	338F	3348	1862
MENU2F	A	001	33B7	3350	1866
MENU2H	A	001	33E7	3352	1870
MENU4	A	038	3435	3355	0852 0853
MENU4B	A	001	340F	3354	0852
MENU5B	A	001	3435	3356	1174
MENU5C	A	001	361D	3383	1236
MENU5D	A	001	345B	3359	1178
MENU5E	A	001	3483	3361	1182
MENU5F	A	001	34AB	3363	1186
MENU5G	A	001	34D3	3365	1190
MENU5H	A	001	34FB	3367	1194
MENU5I	A	001	3523	3369	1198
MENU51	A	014	345B	3395	1174 1175
MENU53	A	040	3483	3360	1178 1179
MENU54	A	040	34AB	3362	1182 1183
MENU55	A	040	34D3	3364	1186 1187
MENU56	A	040	34FB	3366	1190 1191
MENU57	A	040	3523	3368	1194 1195
MENU58	A	040	354B	3370	1198 1199
MEN22	A	040	3367	3345	1854 1855
MEN23	A	040	338F	3347	1858 1859
MEN24	A	040	33B7	3349	1862 1863
MEN25	A	048	33E7	3351	1866 1867
MEN27	A	040	340F	3353	1870 1871
MFCU	A	004	2984	3026	2858 3034
MINUS1	A	002	0B9C	0056	2040 2130
MOV1	A	006	23D8	2519	2512* 2513 2514* 2515* 2516 2517* 2520 2546 2547 2643
MOV2	A	006	24B5	2586	2520*
MOV3	A	006	2486	2572	2547* 2592
MSGBGN	C	001	007F	3394	0427* 1245*
MSGO2	A	016	31B3	3323	1308* 1312
MSP	A	011	3034	3303	
MSPB	A	001	3029	3302	
MULT10	A	006	1A9D	1532	1534
MULT12	A	006	1A6E	1515	1517
MULT40	A	006	19E0	1475	1477
MVC1	A	006	22BE	2387	2380*
MVC10	A	006	23D5	2518	2516*
MVC2	A	006	25A9	2659	2643* 2644*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
MVC3	A	006	21B1	2253	2252* 2271
MVC4	A	006	21F7	2272	2271*
MVC6	A	006	21AB	2252	2251*
MVC8	A	004	2024	2081	2078* 2079*
MVC9	A	004	1EA3	1939	1932* 1935*
MVI1	A	004	232A	2424	2421*
MVI2	A	004	2335	2428	2427*
MVI3	A	003	200C	2076	2074* 2075* 2077* 2079
MVI4	A	004	251B	2616	2513* 2631
MVI5	A	004	253E	2632	2631*
NAS	A	001	2BA5	3211	0318* 0319 0454 0455* 0507 0534* 0535* 0541* 1159* 1450* 1453* 1743* 1764 1780* 1790 1841* 1843* 1972* 2155
NBLNK	A	004	1333	0808	0804
NEG3	A	002	1F54	2023	2054 2381
NEG4	A	002	1F56	2024	2055
NEXT	A	004	2057	2105	2119
NODS	A	003	2A47	3085	0109*
NOTBLK	A	004	2869	2929	2926
NOTDAT	A	004	0F0D	0409	0406
NOTSSW	A	005	0E8A	0370	0366
NOT12	A	001	1832	1587	1384* 1435 1469 1588*
NRWRT	A	004	0FB7	0476	0468
NSSW	A	003	1735	1217	1211
NWRT	A	006	112B	0598	0460
NWRTFG	A	001	2A9B	3119	0302* 0451 0957* 2153* 2164* 2183
NXT	A	003	2945	3000	2996
NXTCHR	A	003	2805	2903	2923
OLD	A	003	2B01	3168	0470 1275 1639 1729 1759
ONE	A	001	0A03	0015	0288 0416 0439 0505 0564 0573 0654 0860 0866 0933 0948 1144 1150 1160 1232 1263 1376 1476 1489 1504 1516 1533 1543 1647 1674 1689 1735 1772 1935 2050 2112 2117 2118 2163 2250 2254 2258 2264 2267 2517 2582 2626 2715 2720
OPINCP	C	001	0001	3408	2803
OUTREC	A	001	2395	2502	1410* 1431 1472 1473 1529 1530 2653*
PACK	C	001	0226	3411	0488 0725 2096 2106
PASPRM	A	003	2A68	3094	3086
PAUSE	A	004	0C9B	0195	0170
PFLAG	A	001	2A9A	3118	0311* 0392 0396* 0407 0410 2069
PGMDEL	A	007	30E9	3313	1077
PGNTF	A	006	1820	1308	1126 1135 1274
PN	A	002	2AE6	3161	0273 0717 0759
PNAS	A	001	20C7	2147	0532* 0533* 0540* 1158* 1449* 1450 1452* 1763* 1840* 1842* 1973* 2154
PRGID	A	003	1669	1132	1111* 1308
PRGID1	A	003	17C8	1271	1268*
PRGID2	A	003	0F9C	0465	0462*
PRINT	C	001	021A	3398	0087 0092 0179 0226 0610 0687 0765 0964 0973 0982 0999 1017 1029 1040 1054 1081 1309 1333 1459 1590 1658 1667 1820 1993 2723 2728 2733 2742 2753 2784 2815 2948 2953 3010 3038 3091 3110 3504
PRINT1	A	001	2A2F	3078	0111 0115 0119 0123 0127 0131 0135 0139 0143 0147 0172 0189 0220 0245 0850 1172 1176 1180 1184 1188 1192 1196 1234 1325 1848 1852 1856 1860 1864 1868 1978 1982
PRINT2	A	001	2A77	3103	0616 0987 1046 1339 1998
PRTBF	A	001	0A15	0027	1618* 1619 1619* 1620* 1621* 1623* 163C 1654* 1655 1655* 1661 1672* 1680*
PRTEND	A	004	2A73	3097	3079* 3082 3095*
PRTPRM	A	001	2A64	3092	3088* 3089* 3090*
PRT2	A	006	2A88	3109	3106
PRT3	A	004	2A91	3110	3108
PRWR	A	004	132C	0805	0802 0817
P1IAR	C	001	0020	3434	
QCPU	A	001	109E	0550	0518
QDCP	A	004	1053	0529	0516
QFFA	A	006	10F2	0577	0520
QFFB	A	006	1044	0525	0522
QPUDT	C	001	0A07	3440	3486

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
QTAB	C	001	022F	3441	3487
QUITFG	A	001	2381	2494	
RCTR	A	002	2B0D	3173	0331* 0339* 0414 0416* 0432 0438
RDFAS	A	004	2201	2286	0315 1400 1795 2372
RDFASR	A	004	223E	2306	2288* 2299
RDMD	A	029	3661	3386	2951
RDWRT	A	004	2140	2202	1398 1408
RDWRTR	A	004	2190	2230	2202*
RD1442	A	004	2A10	3065	3056 3061
READAD	A	002	3161	3319	2042 2057
READIN	A	001	0A80	0031	0032 0651* 0653 0660 0727 0818 0831 0862 1925 1969 2036 2044 2074 2092 2098 2099 2100 2100* 2102 2103* 2104* 2112* 2118* 2123* 2124 2124* 2125 2837 2850 2867 2886 2910 2925 2927 2927 3107 3109 3319
READ4	A	002	202D	2092	2101
RECORD	A	004	2749	2836	0151 0257 0341 0636 0771 0854 0947 0951 1201 1873
REM	A	040	3599	3373	1980 1981
REMB	A	001	354B	3371	1980
REMB2	A	001	3599	3374	1984
REM2	A	015	35D0	3376	1984 1985
REPERR	A	004	1153	0610	0357 0359
REPPGM	A	001	1614	1104	0205
REPWHO	A	014	345B	3358	1109* 1268 3395
REPWH1	A	014	3644	3385	1110* 1236 1237
RESNS	A	004	2808	2904	2913
RNUM	A	001	0003	0009	3513 3514 3516*
RPCNT1	A	004	1662	1130	1116
RPCNT2	A	005	1672	1137	1128
RPCNT3	A	005	16B2	1158	1141
RPCNT4	A	004	16C7	1168	1152
RPCNT5	A	006	17A5	1263	1258
RPCNT6	A	004	17FD	1292	1261
RPCNT7	A	006	17BB	1268	1113
RPFX	C	001	0211	3443	3517*
RTRN	A	003	0C4E	0163	0777 0779
RTRN1	A	006	0F75	0454	0523
RTRN2	A	001	0D2F	0261	0780 2984
RTRN3	A	001	16CF	1171	
RTRN3A	A	004	1707	1201	0902 1238 1344
RTRN6	A	004	2A96	3112	3104*
RTRY	A	004	27FA	2900	2908 2915 2928
RTRY1	A	001	2461	2554	2544 2593
RWRTN	A	001	20C8	2149	0538 0544 1162 1454 1778 1846 1974
RWRTNR	A	004	2134	2186	2150*
SAVEID	A	004	2ACA	3149	0297* 0400 0462 0567 0581 0582 0645 0741* 0762 0764 0791 0922* 0923* 1015 1092* 3150
SAVID	A	096	0A74	0028	0296* 0494 0586 0603 0740* 1137* 1295 3466
SAVID8	A	001	0A15	0026	0027 0925* 0926*
SB	A	002	2AEA	3163	
SBYTE0	C	001	0208	3448	3509
SBYTE2	C	001	020A	3402	
SBYTE4	C	001	020C	3449	2450 2454
SCANRD	A	006	2409	2598	2525
SCDFG	A	001	2A9D	3121	0293* 0485 2067
SCERR	A	046	2F84	3292	1056 1057
SCERR2	A	001	2F56	3291	1056
SCNERR	A	004	15CD	1054	0481
SCNVTC	A	004	227A	2366	0463 0476 1130 1269 1286
SCNVTE	A	004	2346	2435	2425
SCNVTR	A	004	234A	2436	2366* 2368 2370*
SCTR	A	001	2B98	3210	0329* 0438* 0439* 0542
SECT#	A	002	2BCF	3224	0536* 0542* 1139* 1143 1160* 1451* 1762* 1844* 2151
SELDRV	A	001	234F	2449	0100 1456 2899
SEQCHK	A	005	0EE7	0398	0389 0391
SEQCTR	A	004	2B06	3172	0271* 0330* 0351* 0398 0403* 0633* 0643 0648* 0721* 0737* 0738 0793 0795* 0955* 0997 1007

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SEQMV	A	004	1FF9	2071	
SETADD	A	004	0D13	0245	0201
SETDSK	A	001	0B9D	0079	3551
SETTO	A	004	0B7B	0042	0457 0584 1292 1784 2325
SETTOR	A	004	0B86	0045	0042*
SETUP	A	024	36A6	3388	2956
SETO	A	004	0B8A	0047	0563 0931 1321 2873
SETOR	A	004	0B95	0050	0047*
SIOI	C	001	0018	3419	
SIO1	A	003	246E	2564	2531* 2543* 2545* 2568
SIO10	A	003	250C	2611	2598* 2599*
SIO11	A	003	2509	2608	2600*
SIO2	A	003	2587	2650	2639* 2640* 2641
SIO3	A	003	258E	2652	2642*
SIO4	A	003	259F	2656	2641*
SIO5	A	003	2468	2560	2532* 2548 2549
SIO6	A	003	25FC	2690	2688* 2689*
SIO7	A	003	24AE	2584	2535*
SIO8	A	003	248F	2574	2548* 2674
SIO9	A	003	2492	2576	2549* 2550*
SIZER	A	004	1833	1588	1389 1395
SIZERR	A	004	184B	1598	1589*
SKDV02	A	006	1AD5	1546	1541
SKD02	A	006	1A5E	1508	1502
SKD12	A	006	1A24	1492	1487
SLAMP	A	002	2AA9	3130	2939
SLDRVR	A	004	2371	2466	2449* 2455
SNBYT2	A	002	2981	3020	2943* 2944 2946 2966* 2967 2985* 2986 2988 2994* 2995 2997 3005* 3006
SNSAP	A	004	2607	2695	2748 2758 2790
SNSAPR	A	004	2679	2740	2695*
SNSDR1	C	001	0080	3436	
SNSDR2	C	001	0040	3437	
SNSDR3	C	001	0020	3438	
SNSDR4	C	001	0010	3439	
SNS24	A	004	25E2	2684	1387 1393 2747 2771 2798
SNS24R	A	004	2603	2693	2684*
SPACE#	A	036	2C3B	3250	1796* 1803* 1811*
SPFLGS	C	001	0A02	3450	3484
SRCE	A	002	2061	2108	2105*
SSWID	A	004	2AFA	3166	0365 0816 1210
SSWO5	C	001	0004	3472	3105
SSWO7	C	001	0001	3421	3509
SSW1A	C	001	0020	3427	2857 3084
SSW1B	C	001	0010	3428	0104 2859
SSW17	C	001	0001	3426	0916 2855 2879 3083
SSW18	C	001	0080	3425	2853 3084
SSW2F	C	001	0001	3429	0084 0107 2844 2877
SSW22	C	001	0020	3422	2450 2454
SSW23	C	001	0010	3423	2450
SSW24	C	001	0008	3424	2450
SS1	A	004	1FA1	2048	2046* 2047 2050* 2051
SS2	A	004	1FA5	2049	2047*
STARTX	A	001	0000	0005	
STATE	A	002	0A14	0025	2685* 2772 2775 2778 2781 2799
STATUX	A	002	27F4	2889	3030* 3031 3069* 3070
STCNT	A	004	1D48	1795	1676 1733
STPFLD	A	004	2198	2249	0441 0682 1148 1254 1403 1703 1738 1747 1775 1805 1813 2178 2180 2223 2225 2415
STPFLR	A	004	21FD	2274	2249* 2250* 2251 2254*
STPSCT	A	001	213F	2200	1396* 1407* 2228
STP2	A	004	1209	0687	0656
STP3	A	004	1D8B	1820	1799 1817
STRSCT	A	001	213B	2199	1397* 1406* 2204
STRTA	A	021	20E2	3312	0094 0095
STRTAB	A	001	309F	3310	0094

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
STRTMB	A	001	3046	3306	0089
STRTMS	A	001	309F	3309	0089 0090
SVPREQ	A	002	2B13	3177	0083
SWITCH	C	001	020A	3415	0084 0104 0107 0916 2844 2853 2855 2857 2859 2877 2879 3083 3084 3105
SZERR	A	021	2FDD	3296	1592 1593
SZERRB	A	001	2F84	3293	1592
SZERRC	A	022	2F9A	3294	1386* 1392*
TDDCF	A	001	238C	2498	2500
TDDCF@	A	002	2392	2500	
TDDCR	A	002	2382	2495	
TDDDF	A	001	2383	2496	2501 2653 2659
TDDDF@	A	002	2394	2501	2648 2651 2654
TDDDR	A	002	2380	2493	2647* 2658
TEMADR	A	002	143D	0696	0841* 0869 0892*
TEMP1	A	002	20BB	2145	1143* 1144* 1150* 2126* 2127 2151* 2157 2160* 2162
TEMP2	A	002	2ACC	3151	2397* 2399 2401* 2405
TEMP3	A	002	2277	2363	0634* 0653* 0654* 0655 0720* 2367* 2435
TEMP4	A	002	219A	2247	2095* 2132 2697* 2739 3081* 3096
TEMP5	A	004	2ACA	3150	1626* 1637* 1675
TEMP6	A	002	2ACE	3152	2696* 2738
TEMP7	A	002	2AD0	3153	
TEMP8	A	002	1F52	2022	
TEMP9	A	001	1F50	2020	2035* 2065
TEM1	A	002	25E0	2681	2686* 2692
TERM	A	018	3046	3305	0191 0192
TERMB	A	001	3034	3304	0191
TEST	C	001	0212	3409	0099 3518
TEST1	A	004	18B5	1373	1365
TFI	A	005	0CB8	0206	0203
TIO1	A	004	2467	2559	2538* 2675
TIO10	A	004	250F	2612	2602* 2603*
TIO11	A	004	2513	2613	2604*
TIO15	A	004	2503	2649	2638* 2645
TIO18	A	004	2314	2413	2395* 2396*
TIO19	A	004	2499	2578	2571*
TIO2	A	004	2598	2655	2645*
TIO4	A	004	2471	2565	2533* 2534*
TIO5	A	004	24B1	2585	2536* 2537*
TIO7	A	004	2475	2566	2539*
TIO8	A	004	2495	2577	2551* 2552*
TIO9	A	004	2505	2607	2589 2601* 2671
TL	A	003	0CD0	0212	0209
TMADR	A	002	1347	0813	0808* 0830
TMADR1	A	002	1E38	1901	1893* 1904 1923 1940 1968
TODRV#	A	001	2BEF	3242	1357 1358* 1363* 1366* 1369* 1372* 1373 1382 1391 2217
TODTRK	A	006	254D	2638	2629
TOOFAR	A	004	2735	2815	2522
TRKCC	C	001	0002	3407	2802
TRYAGN	A	004	274D	2837	
TSTDAT	A	004	2826	2912	2906
TSTDCP	A	005	1454	0913	0274
TSTN	A	002	2BF2	3244	2920* 2921 3469
UDSCN	A	004	1E3B	1904	1921
UDTID	A	004	2AFE	3167	0370
UDTXP	A	004	1E1D	1893	0875
UFIND1	A	004	36BD	3487	3496
UFIND2	A	003	36C4	3489	3499
UFIND3	A	003	36D9	3495	3501 3503
UFIND4	A	003	36E3	3498	3491
UNPACK	C	001	021E	3410	2708
UP1	A	002	2631	2710	2706*
UP2	A	002	2633	2711	2707*
USECRT	A	001	27F5	2890	0177 0224 0249 1330 1976 1999 2841* 2861* 3080* 3087*
UTAB	C	001	0232	3442	0080
UTCNT1	A	004	1E74	1923	1918

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
UTCNT2	A	003	1EC7	1952	1945 1954
UTCNT3	A	004	1EF4	1968	1947
UTCNT4	A	003	1E4C	1909	1907 1914
UTCNT5	A	004	1ED5	1957	1962
UTCNT6	A	004	1EE9	1964	1959
VMSG	A	009	2C44	3251	1822 1823
VMSGB	A	001	2BF8	3248	1822
VTIM	A	001	2B9F	3209	0328* 0491 0493 0585 0602 1138* 1294
VTIMB	A	001	2B83	3207	0454* 0483* 0484* 0525* 0546* 0577* 0581* 0582* 0598* 0599* 0600* 1139 1246* 1264* 3210
VTNAS	A	001	20C1	2146	
VTOC#	A	002	2AB0	3136	0317* 0459 0505* 0506 1719* 1735* 1772* 1791
VTOC1#	A	031	2C17	3249	1675* 1720* 1736* 1773*
WCPUVT	A	004	10E8	0575	0571
WINID	A	002	2B07	3171	0878
WINRW	A	004	239C	2506	0433 0471 0500 0555 0588 0677 0811 0894 0940 1120 1249 1278 1297 1417 1426 1441 1698 1724 1751 1767 1785 1899 2168 2173 2212 2218 2291 2328 2408 2430
WINRWR	A	004	251F	2617	2506* 2508 2509*
WINRWT	A	004	2517	2615	2569 2580
WORK	A	002	2AB6	3140	1471* 1475* 1479* 1480* 1485 1488* 1490 1493 1499* 1500 1503* 1505 1515 1528* 1532* 1546* 1547
WRFAS	A	004	2242	2321	0508 1266 1793
WRFASR	A	004	2263	2333	2321*
WRITE	A	006	0F44	0432	0415
WRT#	A	010	2BCD	3468	1168* 1232* 1246 1319*
WRTREC	A	004	1984	1440	1436 1582
WRTVFY	A	001	25E1	2682	2590 2591* 2595* 2664 2665* 2672 26 3*
WRTVTC	A	004	0FEF	0496	0604
WRT1	A	006	1429	0889	0806 0832 0838 0870 0883 1970
WRT2	A	004	11F6	0677	0672
WRT3	A	004	111E	0588	0576
XEXIT	A	004	27C1	2871	2851 2929 2991 2993 3245
XEXITR	A	004	27E9	2883	2836* 2872 2876 2878 2880
XEXT	A	004	2A0C	3063	3033 3058
XEXT1	A	004	281E	2910	2900 2922
XHANDL	A	004	183A	1319	
XLOC	A	001	2BD4	3225	1322
XREG	A	002	2B11	3176	0082
XR1	C	001	0001	3399	0048 0049 0049 0103* 0333 0334 0335* 0338* 0413 0417* 0426 0427 0551* 0564 0565 0566 0567 0568 0569 0570 0573 0632* 0658 0660* 0661 0661* 0722* 0770* 0797 0805 0808 0816 0819 0819* 0820 0820* 0821 0823 0824 0824* 0826 0830* 0835 0836 0836 0840 0841 0844 0846 0864 0865 0865* 0869* 0880 0885 0892 0932* 0946* 1078 1079 1108* 1125 1137 1138 1158 1169* 1230 1233* 1244 1245 1320* 1634 1639 1642 1643 1644 1645 1691* 1696* 1718* 1729 1732 1743 1756 1759 1762 1763 1764 1838* 1893 1904* 1905 1905* 1906 1908 1909 1909* 1910 1912 1923* 1924 1924* 1927 1927* 1928 1931 1933 1933* 1939 1940* 1941 1941* 1942 1944 1946 1948 1948* 1956 1957 1960 1960* 1964* 1965 1965* 2032 2044* 2045 2053 2054* 2059* 2095 2102* 2105 2110 2113 2115 2115* 2116 2116* 2125* 2126 2129 2130* 2132* 2367 2368* 2379 2379* 2380 2381* 2421 2427 2435* 2507 2508* 2512 2524 2541 2556 2557 2573 2588 2605 2606 2615* 2657 2662 2670 2696 2698* 2706 2713 2713* 2738* 2846 2849* 2864 2868* 2874 3081 3082* 3088 3089 3090 3094 3094* 3095 3096* 3480 3482 3487* 3489 3489* 3490 3492 3493 3498 3515* 3516 3517 3519
XR2	C	001	0002	3400	0152 0153 0163 0165 0167 0169 0200 0202 0204 0206 0208 0210 0212 0214 0216 0218 0258 0258 0265 0266 0273 0276 0278 0282 0284 0289 0296 0297 0298 0300 0305 0307 0309 0333 0334 0343 0343 0349 0354 0356 0358 0363 0365 0370 0372 0374 0377 0380 0385 0390 0398 0400 0413 0426 0638 0640 0643 0645 0658 0707 0717 0738 0740 0741 0743 0772 0772 0776 0778 0789 0791 0793 0797 0803 0805 0816* 0825 0825* 0826 0827 0831* 0837 0840 0857 0859 0859* 0862* 0864 0872 0878 0880 0885 0913 0922 0923 0925 0927 0953 0955 0996 1014 1086 1088 1088* 1092 1109 1110 1111 1115 1203 1206 1208 1210 1217 1219 1221 1224 1226 1230 1359

DD62   3340 CE DISK EDITOR   MOD 12

CROSS-REFERENCE

```
SYMBOL  T LEN VALUE  DEFN    REFERENCES
                             1361  1364  1367  1370  1378  1378  1379  1379  1386  1392  1630* 1642
                             1643  1644  1645  1649  1649* 1875  1877  1880  1882  1884  1886  1894
                             1894* 1906  1916  1916* 1917  1919  1925* 1934  1934* 1936  1939  1942*
                             1949  1949* 1952  1952* 1953  1957  1958  1961  1961* 1965* 1969* 2033
                             2035  2036* 2037  2039  2040* 2041  2045* 2048  2048  2049  2049  2053
                             2055* 2056  2060* 2062  2063  2064  2065  2071  2071  2076  2080  2081
                             2081  2697  2699* 2707  2712  2714  2714* 2717  2719  2719* 2739* 2837*
                             2838  2839  2839  2850* 2867* 2874  2882  2882  2900* 2901  2901  2910*
                             2916  2919  2919* 2920  2939  2972  2975  2977  3057  3062  3486* 3488
                             3488* 3490  3492  3493  3494  3495  3500  3513  3514* 3515  3516
XR2WK   A 002  1F52   2021   2022  2041* 2042  2056* 2057
X12     A 002  2BE3   3233   1485  1488  1490
X1403   A 003  0A12   0021   1612
X1442   A 001  2A2A   3072   3065*
X19     A 002  2B82   3206
X2      A 002  2BD7   3227   1500  1503  1505  1539  1542  1544  2077
X200    A 002  2B7C   3203
X255    A 002  2279   2364   2399  2401
X256    A 003  2B77   3200   0335  0417  0655  0932  1233  1691  2518
X3      A 002  2BD9   3228   2515
X3FFF   C 001  3FFF   3416   2847
X4      A 002  2BDB   3229   0536  1844  2370  2769  3037
X47     A 002  2BE5   3234
X48     A 002  2BE7   3235   2157  2160
X5      A 002  2BDD   3230   2075  2509  2514  2644
X5203   A 003  0A0F   0020   1610
X6      A 002  2BDF   3231
X74     A 001  2B78   3201   0286
X8      A 002  2BE1   3232
X80     A 002  27EE   2885   0291
X87     A 002  2BE9   3236   2078
X87C    C 001  087C   3470   3107*
X880    C 001  0880   3471   3109*
X900    C 001  0900   3467   3496  3499  3501  3503
X95     A 002  2B7A   3202
ZERO    A 005  2B47   3199   0329  0459  0634  0720  1471  1484  1498  1514  1528  1538  1719  2268
                             2301  2376
ZOUT    A 006  2000   2074   2070
TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY =                0
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DD62   3340 CE DISK EDITOR   MOD 12

OBJECT CARD LISTING

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

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

•GBK•GBD̄•••PN•42  48216•EC•571872•  3340•CE•DISK•EDI  TOR•••••••MOD•12  84@@84@@••••••••  ••••••••DD620000
TD-YK7OH••&••B9U  ••<E••+•••+D&•••  ••••••••••••••••  ••••••••••••••••  ••••••••••••••••  •••••&•<DD620001
TA&%I&DA•&DA••••  ••••••••••••••••  ••••••••••••••••  ••••••••••••••••  ••••••••••••••••  •••••KIUDD620002
T+->2(•-.SLO•K|@  <"UT=K|"•/0••(•-  .WGO•"53="?"•/0•  ••&C""3S••T|2D•-  11K%J<*M,D3-A•-7  2DA-•L•MDD620003
T+-?_OH*BFUIR<I"  "@<BG•/YF&3C SOH*  BH?"OOH*BD%BGH4@  #"2D̄_+"@D̄Y%HAK••  8D•H.OA•(H3-A•-7  2U•&•6L%DC620004
T+-OY|•*D̄K<BGH̄S@  AITGROH*D̄.ODY<-G  •/2Y?•K-2H̄*BGH̄S@  AH̄CIJOH*D̄.ODY<XX  •/2Y?•K-2Y*BGH̄S@  AH̄CH•LLMDD620005
T+-1T2*BGH̄S@AH̄C.  1OH*D̄.OHY<1X•/2Y  ?A/&OH̄*BGI4W_P5'  -OHD<&,5$•|H̄AM$5  /•|HAC$5&•*BACH=  'P•D•P3DDD620006
T+-2;@YD4OH*D̄.OQ  X(¬*@@BD̄T+|•X'*•  &CD.•/OHĒJ/&1)¬"  -OH*BH?"-OH*.@%B  GH̄S@FDTAFOH*BE%B  G•SH•'A@DD620007
T+-3R"=G•/O?.?*D  A@YEY?)UA@-DG?M•  DO•DOEH4A•S%COHD  )V84A•S?6@-UG?M•  DO•DOB#7L•*BAF4=  (•&H•8CODD620008
T+-4MH̄OP•-J1ZT&D  BH̄"T2•&;'&•L•-J/  7OH*D̄.OQX(¬*8@B¬  5OA•<&%BG•/,FELE  ="=.•/OHS"=.•/O?  2OH*•4Z&DC620009
T+-5|H̄S@FITQ)+|•  X'*•&CD.•/2)I,N'  ¬Q<BACK<:C2D̄_COQ  D̄YBD̄-C•QO@CD".A&  1DA@%G3D8|3-|H̄D̄,  •DAH•=9@DD620010
T+-6H̄J&&OH̄O%D̄5H4  ACB,WO•DMNC3OH̄D̄+  (•5@D̄5<•AEMF'5•C  2•&*@@BD̄¬@Y*OT&N  &BOX2-KS'&D,••JM  (C•••O/•DD620011
T+-7ECR*,;•8•CR*  H̄•#5••<BAE&4(••6  PI=#••&6||•@D̄XK1  ¬BXJ¬.•<D̄2V>(•VY  ,E%BADO>(•VY,F¬H  ACLO•#:HDD620012
T+-8•"2D̄$C•&,D̄2%  V@Y*5T&<CH̄2C2•J<  %•2,ĒNTO|H̄Z='55.  2•&&@C2D̄ĒOH*KG*B  GH-D<•KD̄OHXH<AB>  VHW@•8H̄•DD620013
T+-8#C•&,D̄2>V|••  ,W-OAH̄9-,JOQOH̄O%  D̄63OAH̄O5%P''¬$E'  ¬P3QAH̄7¬2/OTB•M-  •|••,C*BGI4W_P5'  -OHD•¬H*DD620014
T+-96CTH'•BD̄¬@-E  >?;H•@-DH̄AT•,B2,  $OH*+<,7R•|HAE$5  ••*•ADN+'&•$••JE  LOH*-.?H̄GD̄$5*•<B  AD?D•$L•DD620015
T+-:1T&<CH̄?,2•&%  8"2D̄-OA•LF¬H̄GT84  C•2,=OHDL'Q4C•2,  >OHDMGQ4GA2,6OHD  L-#7E•<BAC3+'8OC  ••JM•NCDDD620016
T+-#%HL7OH̄Z"2•&W  (•&DD̄:<BAC3<'C2D̄  ¬@-D).&<D̄6V"••&#  X|&@D̄W%•AC3<'•SD̄  %O•D|<3,OH̄ZD̄(•5@  ,B@••P#-DD620017
T+-@X•JNAT&($H̄%,  ••JN2AT•,B2,$|&•  D̄X"H̄AA3-|H̄Z,2U•3  •/1'R|¬@D̄W%BAC3(  %P5'¬|K@,C*BAC4&  +•B%•6CDDD620018
T+-'SC&YC(-D,)@B  GCTH@"2D̄;+OD̄DYW1  ¬P5'<¬"@7I-O•H̄:@  ,C*BGH91•K••,Z-8  AH̄9-,C&8AH̄9-H̄•@B  GHR%•8KWDD620019
T+-=)H̄:%'"2D̄:O•D  +H̄T7"H̄Z?•-J•-C•&  ,UK>VC•&,ZK>,CH*  .:•4AH̄,•,J@BADK%  <•-=*H̄%X•/2I:•+¬  X934•8Z•DD620020
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DD62 3340 CE DISK EDITOR MOD 12

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-"Q =RaYDL|	,,00BK Q, *BGH91	K ,Z%BGHXY PE1	*|& |>aBAE*4< S>	IBWa< B>.BX ' BD	)aYD *IODD620021
T+/ LB*BG SQBEW8	,W-0*KA0,X01¬K(a	H)COAH:aa DX"C|9	I"UX"OH*TXDAH B>	WC-DD% YCC DS*SD	OC & K#MDD620022
T+/A+HWa,Z*BGHU.	/1HD|¬aDY|HA.C-	|HD,2DG (-Z?H1$	2-$%(-Z?H1X2-&L	/0*5C &,UK%VC &	,D2% 3.UDD620023
T+/BI(|HGD3T"HZ3	UAORC <-1S_K| M	-100CH:&,MTOAH:M	< K?|H'? /2CHC &	-12I?C &,ZK_CC D	,32% LH&DD620024
T+/CDW<BGH<-<AB>	JH4<<AB>,H3X2/6C	B M- C &,D2%=|	,,a5GH92 K ,ZTU	|HD?2DB, /0>HL D	NB-< =B%DD620025
T+/C"L <CH8A< -Q	D#MO BB,HL &+H6_	<EIa1DDO¬?3D8aY*	EL-DNB-<a B>?aY*	%C &,UK_/C &,D2%	?| 2JODD620026
T+/D:H:a< S>IH%U	< B>.H%, /0_8CA1	HGB>¬CE*H70Z40H*	TXDAH B>WOH*KD-0	EH8UH$00 H8%H* 0	DH9D a1ODD620027
T+/E5H4-<AB>,H44	<GD-*H9a<P4T¬BXL	/0"?OH*BF%HS.,,	"9*BGHX¬ /OHS"=P	/0B2+? DD%HAK	D<E% 1,&DD620028
T+/FOB2,$C DS)2_	GCH*XK$7E |HAK#7	T < AEKF(5a,Ea	AEMF(5%D2% AEPH	F<B%.H_? /1'R|	H- & $BODD620029
T+/G, KI7BYD* KI	7B-<(KI7H7¬2/DJ	%&MEE(-DH-)HA *B	GDPa8C2DDa/ JC &	,D2_/| ,,3?0HD,	2/0Y OC*DD620030
T+/HWC &,D2_W|	,,a&GH91 K ,Z%B	GHR%,R%BGDBC /OH	E1Sa_/?"YOH*BH?"	YOH*<T3&HDDW'aET	2 P% 1E8DD620031
T+/I/|| DY3-|HD%	#C2D,aZ FC &,RS_	OT&D<H>$2-J&< KI	7H4*F<B%.H_?B M-	OH*J-aBG S<BB_Y	,5L4 ;/%DD620032
T+/H*4B?NaYH:|¬M	,5¬HD<3Y|HDYD<B%	.H_K(5a,Ba AEMD	%POZ4P2OCH%Z$T&E	EH_$2 &Y:C2D,C &	,RS% a5%DD620033
T+/.PEaBGDOa#C2D	DOH* 4A<|4D9?H	AF OB<|&D2L1-<|M	< CC6H%, /OHE Ua	1+<HAK C /2)I,N*	¬Q< M3ODD620034
T+/<K-J.|+OaD,$5	/ <BACD:'OOC -&1	+OH*(.84CPO%IaYD	QT&($H%, JN2T&(	¬HO? JNAAT ,B2,	$$Ea 11HDD620035
T+/((P5" /OaR| -	,?3TOHDC2D S(&M	.B¬HAA61¬P5"2/"O	4 J(GC <,?S_K|	,OaBGH92 ,>U4	B SY LY DD620036
T+/+H=% AD23B -D	B4-DB4-DA¬M AO D	LOX1,)HA =HB 6O	A B'EOG -J(U(&D	LJaHBBYC2/:QaAZ>	"¬D 2,8DD620037
T+/|C"53="?="8-X	2-RN%BO%.(DM|LO	BH=Z(-%D7?HACM4	BB2,/O DN,LOEH=,	/2Y?AS64(*BGI4U	a<B? "# DD620038
T+/|=:#5 <BAEE7	S -D| B?,B-| J|	EO-HH-FO?+2"K L	| B?DB-| J+5(&D	M|¬HG(.5 "HAB3T	OHZC O#-DD620039
T+/&9OA ;G¬ G+Y4	AAK%Ga-D2$E'¬P30	FH#a:aBD*aY*<$E'	¬P30EH#a:C2D*C <	,?S_K| ,03&AEC7	/2< &A-DD620040
T+/J4XD B>'+ a	D,% &GO 8aBD-OI	PAaBGCTH(T8,G|H	ADT-A -,2UIQ'aBD	TO D<R"HAS330HD<	% SY "J%DD620041
T+/K?2L8% B,H+33	"HD %F Y4(O¬BV&	1P2OM<J 4CAa1+CE	¬| &,:%BGB8Y6 K_	7CO ,:-YCO DMW-O	CH:Y M/HDD620042

DD62 3340 CE DISK EDITOR MOD 12

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/LDH5HaAK>,| <	,,a&GH91 K ,ZTO	EH=,B M- OH*XK&a	H=YH a AE<%a"2D	-OH*XK*BGG5W' -.	J& O$ODD620043
T+/MV7K&CHO_¬||a	DWaBGC¬G /OHE1TH	_N""TOH*BH?"TCH*	.2aBG /,FG2'O"=L	/OHS"=L /O?.OH*	BF%H 7/HDD620044
T+/N-HS::"=P /2Z	7OH*BH?"V|& DD%B	ACT. /1E". <>8Na	< 2#6HO? /OHE1UY	?A|"WOH*BH?"WC&<	,B2Y)T4DD620045
T+/O$5<BACK<' BD	DOHD+<%BGDPa% 2a	/OOOC.3*D2%BG /,	F<2a7"=¬ /OHS"=*	' BDDOHD+<%BGDP"	/OH 'CGDD620046
T+/POF%R .¬$":%B	G S."%BGBa? /OH	EOS8>I|",OH*D)3-	|HD# DA6'OH*BH?"	,OH*+<%BG /,F.S=	D"=4 6K-DD620047
T+/QJOH*BH?"_OH*	N53%|H" aGCC5C Q	OaCCZGA&1DI8*G3D	8?aBG /YBL3D8?O%	GO D.2=HBACY|H"	% SY J&aDD620048
T+/R<2&Oa BD;+-a	D,*HAK %ATJ$ASO	F(U&F. HOE&Q8C2?	OOA P>84BAS%*a-D	TC &,D2%9| ,,aB	GH9O 4O8DD620049
T+/EG-D- H:R(-Q	,G< AFB aC2D-aY*	&OH*S;-CP2*&' AR	WOHDQHA1¬BXL¬GAC	,X1O< K?|H9-'C2D	-a-D OY<DD620050
T+/$EH&OAH.%,3Oa	AH.%H OODHaU,&3O	Ha7 /2F$HaU| KB	#B-| JE¬aY*NG &	-1O8<AB>VHWa| K?	|B-< N&ODD620051
T+/$'OH*-2CO Ha7	B M- OH*D.ODW(E?	/2Y? K-4-aBGHSa	AHCK,OH*D.ODY((|	/2Y? K-4=aBGHSa	AHCM RBYDD620052
T+/*8HaEGHSaFHCN	.OH*XK$7X <BABa>	'1&C2-N:'P C2-L:	(O<D=?HAC3-|HDC	2UBaaAB>"OH*LG$7	R < 9L8DD620053
T+/)3 J/&?M AO D	QM.5 A% AFEB'& .	-J/&?M GCHDQM<B	GHB9%P5'¬C- ,3&Y	C(-D,)aBGHSaFI3R	DOH# :T*DD620054
T+/;>EO)a1&A<¬"a	7I-8AH9-,3*BGH91	K ,1<BGHR%,2L4	|HDC2 &%a B>?|	DY|HGO 8AHXHH OO	DH9D JY8DD620055
T+/¬ZHWa<ABI?HaX	/2IBC HP2CJ$OH*	S;-A &D <ACC6K -	' A¬EaYEHC IHAS%	A| ,,aBGH91 K	,ZT- ¬DODD620056
T+/-UC2?OOA N8*B	GHXY PE1*| D,,aB	GB7-<"4X"K|a<GD-	*H9a<P4T¬BXL /2+	*&D- H:$ /O?.C H	1Z1C 2O*DD620057
T+/¬E*BG /YFE3F	3+ a,a< &E-G /O?	.| ,3*H K C /O>	HC &,2K?MOH*P)%B	GHSaFIS:Q+| X'¬H	&E< OYODD620058
T+/SE/OHEOSH>>?"	VOH*D)aBG S."9*B	GEO*a S?DC ,#S?	?| ,##7DA* AF$O	'a&$2 &&aOB???¬H	FO D E1-DD620059
T+/TNF.Ma2B???¬<	Fa-DD|(,##74A?H	AAC3OH=a' B??OHD	R_&a H=YH "HACHO	AA E% &QHOH*C;O4	H=a PH<DD620060
T+/U&H=#2-)Ya A%	2C TLS?>. ?W-L	/2PS+&<.Q%B&F3*	< B(+H=a% B=EA%B	GI;H9 O_SOI $<OO	CHLa =D&DD620061
T+/V.H4*< 2D#H5$	/2E OH*S LOOHW"	/2F$HWa< 2D#H4*	< 2O"HW# /2E |	TVOCDH:%,PCO H:"	/2< &-HDD620062
T+/WFXHAH B>WC &	,D2_P| ,,aBGH92	K ,ZT4 H9¬ JX	C| EHHCO KBH' A%	2aYDH| AHHCODKBH	a B% JB&DD620063
T+/XA,aBGH91 K	,Z-OCH<Q,N-OCH:&	-1TOEHaaaFKCG|BD	,Z*BGH<T /2(|OH*	.?a6G /,F<B66"*X	/O: *DHDD620064

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/X@234 F3.2-$4	< KD6H4*< KD8H9*	< KD:H9U@HB,FC-D	D_SD8CO D1-YCO D	R8 8AH,QD>-8AH,Q	D>-0 'QQDD620065
T+/Y7 K,FH4*(KD	6H=|2 -|2/1Q| KD	6H=<+ K,FB-<(KD	6H=| /Y+C DD?8,	FC DD?SD6C DD1S_	GC D 5EDDD620066
T+/Z2H,QD? 4AH,Q	,5"HB "HGE-@AH,Q	,508AH%QH 04AH,Q	,5@ BFU-< K, H%U	@CB,FC DDCS_GC-D	DOSY 22@DD620067
T+/D__-@ H%QH @	AFW6+ K,BH,#2/6U	< KD6H4*< KD8H9*	< KD:H9U@BS,FC-D	D_SD8CO D1-YCO D	EX&O 4/QDD620068
T+/,Y K,FH4*(KD	:H°*+ K,FB-<(KD	:H°¬ /D"C-DD_S,	FC DDOBD6	DOT4	H,Y =E4DD620069
T+/%T@YCO| HDO-O	H,<DOC_ H,&[K,	H%L2/ |2/0&:&BD	4B <D_B,B+1 D_C4	|H%.2/ |2/0&:DBD	4C ;JDDD620070
T+/_;K8 D%OO KBH	D_<BGFQ& ||@$<T&	HF4# /OHE1VU?7¬"	?OH*BH?"?OH* C-	BB-"2DA*8H YJ@/	&| D D$YDD620071
T+/>RF90@ J?$|D	$¬C1 F8 @& DLCG4	HU-DL|F HFC1-BVY	@KOZM| D,#&&BH%Y	D9 ODH:%,LLOBH=3	B -Y 69@DD620072
T+/?MELOBH=? /10	5L&HBH7"2 K@GHB,	HH__(-Q, *BAF9=	* -HFX DBIOMFZ=	*G32"CO ,:OYC@:D	#8-H E:-DD620073
T+/O|&%8GF9@' S?	,@YDS|D HUOO@BZH	HU30|HZ# /OHE P@	HU34|HZ8@ BD;O D	$V@BG /YK+ H,:"H	&ACO '/8DD620074
T+/1HG ZECO ,# Y	CC H%E2,HOHD)KCO	AH=4<AB>,H2@@Q Z	EOH*$V3&HGDU| B?	_B-|2-&-6 K_7OH*	CO RKUDD620075
T+/2E<E?_|B@,,@H	AK C /2+*-D- H:$	/2F$H:? /11FO-E	H OAH, ,JO&B.A*	D9 ODH:%,LLO H:"	/2< =&@DD620076
T+/3 XHAH B>WL&H	FHOG2-J9(-H,¬"H	A, 8AH, H O*-.A*	D6@BGHR%,D@BGGG@	*AB>VC-0DH#M,D30	H#U ¬$<DD620077
T+/3#OH*/W2>5|	,>*EGH92 K ,%D4	B S_"@-EEL&HFHOG	-J3AG D,31M*ABC	GCUODCS>V| ,,@B	GH9O 1Q<DD620078
T+/46&D- H:Q+ KD	OB-<GHBOPH_? /2F	$H:? /2CHC &,ZK?	IOH**OLO H:" /O_	8OH*TXDAH B>WC &	S$2# @8&DD620079
T+/51Z &OAHXHD% O	BHWUSE*BGHU. /2H	AAD %+2,M|KHS$|H	B<T4AHW"2-J F&BO	#H_? /2F$HW" /15	K|C L *DD620080
T+/6%HW@F<KO#H_#	/2F$HW@'HSI%@-H	DOH*)*<BG /YFLB1	DOH*.23Y|HD#B M-	C <-1S_KC <,ZB_	K| D JRODD620081
T+/7XH<*@AK>VC D	,327$OH*-2<BGHS@	AIT<"OH*D.ODY<6¬	/2Y? K~3T@BGHS@	AHC+7OH*D.ODO<=¬	/2Y)CDDD620082
T+/8S.0GY(" /2)	I7;* OHD¬H.7E <B	AG2S(AO*D'%BAD8+	'00C -J&)7;&'O D	¬<.5 @BAU"M4 J8	88-H L& DD620083
T+/9) OOCH# ,MTO	FH#@@ B?COH*TXH	B>:(&D:+(HA 64	A -.2 &(@9OGK &(	'& C2-&_'EOC -J9	BOH* LD%DD620084
T+/:GGU3S -F C	2-&>'EOC J9-OH*	;+3MAGTTK &|B -D	C4-DA¬M O D;¬71	, C3"GDLK &GS -D	+ A8 NKODD620085
T+/#LZ YC?M O D	;UFO 5 J884-D	D4-H ¬;* @YD&¬M	@YD74-DA8-HAOH*	;%;HB $5, < AG%*	4 KY $B4DD620086

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/+/@+%WO F°& G	2-&,K &GS -G /1#	N(&DD%_HB <BGG,D	5 J88O-HH-<BGEBU	@ K>V| M-1@BGH<-	8@B* ¬L8DD620087
T+/*|°*B&G;7 /2Y	? M85W*BGHS@F(3P	&OH*)#L?"HD# /0?	.OH*BFUH8<AP"9*B	GHX*8@B¬5OA)#*B	G SH $OYDD620088
T+/=D"=P /0?.	**7** (--H34	AHD32-Q*4 J*Q(H	D%SO G5AQO~HH6.7	& |HA #OD CQ8B90	4 /@ 2,4DD620089
T+/=M-4AG5H1Q*	BG7PB &,P4-H	¬Y-O G:Q¬YD8 &F	> DAC- ¬Y-YC|&&	¬Y% AG9_% -D (-D	¬NCQ $LHDD620090
T+/":/'OI H¬M-4	AG5H1Q* BG9*5 J'	Q(&HD%S1AB7)QTDE	B87;@8OB< E-¬MC4	|HZ72-LQ8C2DE@Z	G, * K.MDD620091
T+S 5L5"2/2-< B	+BYD+ B +H*6@"O	+ @ +H*< B VH=U		B VH :@ E;% ER	POH* DD(-->L&	AHRY 09 DD620092
T+SAOOH*BI-&H/&D	AC DH-ODAC D-Q2	_O-DHSC3TBY @ D	A(D-Q*BG SQB	G5 ¬HAH-8ABY<	H 74 5Z@DD620093
T+SB,EOG2 &|K &G	K &H+ KATB-<+ D	AB-| /2AP| H7OO	FB_8H7@HAB_*4 KB	#C&D-Q2B#@-H.¬	(-D @,@DD620094
T+SCWB93 /2BE(&D	/W%BG	C&HHL*	< KB#H@@ BD$C &	,?2CGC &,2K>VC&U	->2% *1&DD620095
T+SD/9"HDCLO?H@<		KB#H=¬2/1 < B?	CH.%| B?CB-<@C2D	$C ,3K?COH*TXHA	H B>:OH*TXCAH B?	DOH* JY<DD620096
T+SE*HR%,?@BGHR%	,2L% HZ? -KCSOH*		(-	/UOOCH#8/+30AH#@	<BK?(H@<@.2?C|B@	,3&O J@*DD620097
T+SFP B(+H=# /2+	*-D- H#Y< B(+H="	/2+*&D- H@L /2F	$H#" /2F$H@U(2>	=HL" -SEMOH*	L$HDD620098
T+SGK (-S 8	AH- H OOAH$ S O	AH$Q ODHR- 8	AH- H 340HRT2 -U	+ BFQ8-|2/2&'D2F	P@-H &EODD620099
T+SH(CLOAHR-+ KF	PB-|2/1 + KFNB-<	< KFPH4*@ KFQC D	/=SF6C & BFQOH*	C&HHUD<AB>5H2Y	@ B% &BMDD620100
T+SIH>*BGH92 K	,% 4BK HSE¬HAB&O	HHXIHB"HGE OAHXH	,JOODHW@,KCO HX	@ BIDOH* C&HHWQ	<AB% NZODD620101
T+SHC_K%DI ,>*B	GB7-<B4-.HX. /2+	*&D- H#C /O 1%G	S PE1	* "3&HH444 KI	7(&D OE&DD620102
T+SH=H44+ K((H'?	/2HAC &,D2_(| ,,04AHXH,J"HA/'H	A 3&AH%<6 J'M||	H"03=K|9H"OOCK <	,- O P$ODD620103
T+S.9 U-F (U-	FHXP2 &Y@ D/"CG9	H¬U/": DY&O H1M	TLTYCH1M< K,<HXH	(K,<HXX2A 4| K,	<HXU N9MDD620104
T+S<4||8,,"HGB-O	H:@D3C3"HDG /2+	*HD- H:$A B<1OH*	/W2>,|¬@DY* AH>%	4 K<_I |HGEL&	AH3- *RYDD620105
T+S(?| @ CO H:"	/2+*-D- H:Q5 KI	7OH* 4BB(4+L-	BC|H&BC3 H48@@L	Z+2 BC|H&BC3HH48	@@T $#<DD620106
T+S+DH*BG			H8OT-O CH@	4BBMS(DD%YMAIKH	+ KM *:4DD620107
T+SVHS?)| Y,:/O	AH= DC DVGS|-C-D	T8B?)C-DT8B?RC D	T63|-C-DT8 YCC H	B_7C UT¬- C D	U>B< ESDDD620108

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+S£-8 4CH7U,)<B	DI3N8H C DBLRC	U$2(+C U$B(+C	U*S(++-HU*-0 IH@	TL-0 I.HTLTYAI.H	< B£ 3ZYDD620109
T+SJ$EB(+C U)S(	+;D @/ G+-DU$"H	GHTYBIF@<KK-H="	< KKIH=< BK&IFO	< BKLIFO:KKLC	UVS< £3YDD620110
T+SKOLTYBIIR11 I	11-LA BE1@0 @0	0£U**D IO<8 SJ	?@ZBPC UWS(+C U	B(=**£B@0 @0	C0£).4DD620111
T+SLJIIPA BLJ¬@	HA*0@H=YH @B	AIZX3 GA BK1C U	B(=¬K @YD=+]@	V8L?"I;G DBKFOH*	UQL0 89<DD620112
T+SM<"2P/OH*X 00	I£4TLTYC1£4< BM	HH48< BMFH48< BM	£H48:SM£C VEB(	+**£B**QD0£ W£¬<	I< N-8DD620113
T+SNG 3A BM]C£	X 3MAH,H@ OH*	C£HIMO] B?DB-]	-KER]£4.R"HAE£O	AIMDVGTO 'C-_	X@YD "-MDD620114
T+SOB¬*BG < BO	DH48< BOHH48:KO	HC VYBOHC VT2(	+C DV,B]-CODV,B?	)C VXBOD<<£T-CG	DH9£ 3Y DD620115
T+SO'0£ W£¬< LG	FH9L3 <AB+RH8*	11B+MO£ W£¬< PG	FACGDH8 <A H8]	'H C -KM<+]@V8L?	"I;G =R%DD620116
T+SP80A UU%BGIF9	'H C -KME+]@V8L?	"I;G DBK]OH*URO_	- (-WATCEB/£	01BP-<*£V7-0 I¬4	TLTY 'I<DD620117
T+SQ3 KP'@0 G<*£	V8<£G 4BBR@(D	D3T£BHR,B £_-0-H	.B30FHO8@AB%](D	W<L£BIT] /OH; £	LT£DD620118
T+SR>?D A4-DA8-H	CC0 ,COYCO DWH8C	B £%I8-HCCO ,C-Y	CO DWG@BG /YB.K4	VOH*BF-IO.(] /OH	EAV@ OD*DD620119
T+SEZB5@5 K,+(£H	/W£BG C /OHEO/M	%¬¬""OH*V8%BGI-¬	/OHS""" /02]OH*	BF%HV.]T""%BGI-¬	/Oh 9Q%DD620120
T+S$UH?"=OH*<T3£	HIOH] K*BH'? /2P	S+A HD"H£AC34.E	8H YL@Z D]]<%MC/	B/]2U £@@S1£+H	HD"H :E DD620121
T+S*¬U £@@K1£OH*	BF%QU.FT""<BGI-¬	/OHS""3 /0 OH*	V8T-AB/L DBR'+£H	.QCUAB6G UBMT+KM	.QCU 6CYDD620122
T+S]EG _/+P-.Q%B	£IH£< K*BH9? /2E	"OH*BF%R+.X."#%B	G S."#%BGB@%4BB¬	%0-HH-.1 P:1;PV@	#@B* 6S@DD620123
T+S;N'LOEHD08 £H	(@Z E(DD%-0AI7£	""@BG 5 KD2O-H	H-<BGI@D8- H.OA	Z:C-A -,2D(48H H	.0A LL@DD620124
T+S¬£HQ£8D H.@/	H+? X'*BGI"Q4 KD	2C DX_G A0H* <H	BBY 5 KD2] HD,C-	HD72UBG /0>H$E"	¬P34 #T@DD620125
T+S-. SD%@YDK+ D	BC¬H£B3-A -,2D K	%A5']OH* EA£BY	9 <BGH4@5 S-	/,H+C/]<Q£¬<£DL	JH"H 7T8DD620126
T+S/F+D ,@?H£D3-	-H". DB¬:@1 A0-H	H-<BGHEM8E8?2OI	YBC-DH". DB¬:T	H"D1FB?2@1SA8-H	A(H QE%DD620127
T+SSAH"H'£B,20HD	YG%BGH P3FD '£ %	C@-DHCQH. -%COHD	X=%BGI@D8DBDS@Z	(T DAHDU#"2DSOH*	ZI3D 'SMDD620128
T+SS@£KWC<D<:-L-	DHQC2U(Y8 SW @/	*OH*BF%D](WG"@*B	G /YFJLEWOH*BH?"	1OH*Y-¬(CBCOAHDO	1JB* JA4DD620129
T+ST7@CE@HP"3£&C	A£STE<DHZ-LUHHQC	UBVD@4<H+ DDY?H	£.5]HAACYHHDH	'Q£C2 £D'M G2-LU	:BBY 104DD620130

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+SU2YT-HHD.2D 0	: KDS]]DDY@BGCK@	O£2WA+ HZ-]H£D3-	HHQG UBU<+/ DY%B	GI@G3£OT /2¬A<D<	Z-L- 1#UDD620131
T+SV_ SW @/ <+ -	Z-* £HK¬ /2U>@4<	H<M£X@TEBHP"3££C	A£SVL<DHZ-LUHHQC	UBVD@4<H<H+Z.%B	G /Y ;SUDD620132
T+SWYJS<Z9""%OH*	BH?"%OH*Y-£A" A	<GOHE*1'K¬O@"D	O¬DZT3C3I"£9/S¬	4] HD,< £H-3 /2W	D(- *A*DD620133
T+SXTH*£] KXDH'?	/OHEJS<Z9""%OH*	BH?"%OH* <GL8@P	R5*GT1MCL5%GD1)V	5)$T£(XEO*LY£($	R£<M 'LODD620134
T+SY;6)XO6LEMI"	@ KD%OH*DD.7XL<	AH-01NB¬2] HD,<B	GH/B<D5@9D@BGHE-	4BBYDON ZZ"(J <E	KH/% KCODD620135
T+SZR<E<X'CWLI"L	D OH*DEC£HHXQ	#@K¬5(D/WTMAHXQ	9 £HH+E BB"H£ "H	GF3,0I"M* BZU AO	HWM RQ<DD620136
T+SDM JOAHW*COH*	BF- CK £&4 KZ	6(£D/W%BG 4BBD	R+ £BB]H£B£1¬B(%	H7"HGA-1EB(YH6%B	G /Y J/MDD620137
T+S,]I%BG	COO@GD1FE £ B		C" A £DA	*2£DD620138
T+S%H]CO@]CD@]C	O@]C1@]L8@¬.O'"$	85'PM1;I O'¬U£FE	/£<]HO*XN8>.WE+L	D84CO4@LC5%]MO"G	O@] @2£DD620139
T+S_E@ B £	C1%$A1%$B1%$F@F_	,£ C ADB < D D	O £ - C A C <	D £ O £A£ C A £ NY DD620140
T+S> A H D	< CO $	-D O J £	O C £ £	/ AH £AH E@B <G	C80 "J%DD620141
T+S>#A]AO=<			A £	8:QDD620142
T+S76 A	£ - C £	A£ F - C ? C	NO B¬	A1<M]Y-DD620143
T+SO11+LN5U_5%R	5@¬MK4CE5:]R2*P	S£(]E1>(2;I 9=¬	XE4CS5@GC1MCA9*G	I4@GB4@N 1_$R£(¬	G5+H 320DD620144
T+S1%K4CI8UCX9=¬	X94CS1*]T5_XSK"]	3']A 1(XI9*N 94C	N5>(6*PA1+/ 5_V	9(PIB4CC2<PC4%G	DO)* =£ DD620145
T+S2X8@PR£<]H1*]	K£($N£]]3']CO@DA	£DA £DCO@4A £DC	O'DA £DA £DCO'4A	£DCO=DA £DA £DC	1@M JK-DD620146
T+S3S£DA @¬I £DA	£DA @¬N £DA @¬R	£DA £DA @¬V £DA	@?A £DA £DA @?]	3@"LO£<$A2)]E1DC	T5U =20DD620147
T+S4)1;¬E0=LT1MC	A£+.I5UC1@DCT2]L	E8>]H1MCI5*$D6)L	A8@XO5MCB1)]O9UC	I8UCT2<N @?J O>T	T1M 7TUDD620148
T+S5Q1<XA14CS5;.	I5;PA4@XD£<TEO*L	E6MCCO)XDQDCC5_X	R1*]T£<TEO*LE6MC	CO)XD£<GN1DCR1;]	R:+< 1$£DD620149
T+S6L2<N 1%$A£<L	EO'I 5_V OMCC5=J	5($D9(]E£<TA8UC	T5_R 5<GN:DCE:+]	E8%XN9*GL2*J O@T	A6*D 3R8CD620150
T+S7+0=]E6;I 2)N	1(XI9*N 1%XE4@J	5%R O@LU54CC5=]	I5_PM2;.S2)PG£+L	D84CO6MCC5=J O@G	RID% 43UDD620151
T+S8I&DCI5;.E6;(	O@GR1DCI5MCD1*]	K£<GN1DCA1<J 1<P	C4UCO9*PRK=]H1MC	F5_]L5>$I5*) O@T	A2)M : £DD620152

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DD62     3340 CE DISK EDITOR        MOD 12
                             OBJECT CARD LISTING
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

T+S9D&<XMO*¬E&<L  A8@E O@GR1DCI8UC  I5;PA4@XD5)R 6)$  O5DCL1*$T&($N&<L  A8@E 5($D9(|E&FA  1(U ¬KHDD620153
T+S9"&<E O@|M54C  61*$D6*N O*LD2)P  G&($R&(XE5'¬I5*)  O)PY&(¬R5%¬RO)L  SK@PR6)$R&<XN&(L  E8>H 3YHDD620154
T+S::C*¬E&4CR1;|  Y5@N O)PD&<TI84C  E5*J &<|A6*J 8>T  N8@GX&<PR6)$R&FA  O@GR1DCR1*GD&*$  A8XY $EYDD620155
T+S#52)PVO)|I1DC  S1)TU;)PC1MA#&($  N&<|A6*J CDCS1)/  ;4CX9=¬X&*$A&UC  R1*GDE4CA5*J ;4C  X9=* 5:-DD620156
T+S@094A 9%G$&<P  X5@PC8@PD_)PVO)|  I1DCI1DA-&<XD&(X  EO*J 9%G$&*¬X9=)  ,&<XD&<PX5@PC8@P  D&*O 4J*DD620157
T+S',O;I 9=¬X9@X  N9*GL2*J 8>TS&@P  M&*|E*>( 2<PA1<P  R&<|A6*LSO@GN&<P  R&)$R&DCH2;( 8>T  S&@P M,UDD620158
T+S=W5DCR1;.E86?  S8@GR86_ 8@TE5MC  R1;|R:<LA8@E 5($  D9(|E&($N&<LR2;P  E&*) 2;1 5)$T&<E  @¬¬ =$$DD620159
T+S"/&(J O>TT1MC  PO*|KK4A 2*R :($  U&*$I8%/ 8*N O*$  N8@XN9<N,&(XE8%P  T&*|H1MCHO)|TK@P  R&3& *OY(DD620160
T+T *6MCI5MCDO*)  O*$N1%XG9(XE&(X  EO*$R1D_ &(XLO*$  R1DCI8UCP6*XN8@P  D&<.E4*$H;_X&O*L  YU<& OT-DD620161
T+TAP2;.K&<V/5UC  G5MCD9=.E1MCP6*X  N8@PR8%PC8@XU5MC  T1)XM2)PA8&PD&M_  &*|U&)N 5_N 8>.  W&*< 6* DD620162
T+TBK5UCS1)|EO=(  2)PP9*( 1<PV2*|  EK4A &|G7QDC3*"L  1&DA &|G8&DC1*|L  2&DA &|GA&(LFO=J  &D  13DD620163
T+TC(&(PO5*N-&|P  4*"E &|1.&DCD2;.  K&<LR2;PE&|E 9%X  L44CE1MCU8%PDK4A  2*R 1(XI9*N @UC  I8U ;9*DD620164
T+TDH1<PS2)XE1DC  S1;( 5_N 8>.W@?I  .1<PL1;|E1DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &D  @OYDD620165
T+TEC&DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA O*LD1*J-&<L  IO** 2/5DD620166
T+TE=5)$S8@XC&<|  D5;|R5_( 5*XO16A  -U|LO1DC1@-D 5<X  S8%XN14CC5_PT&)$  L5<|A&*J 2)N 1)X  R5_U 3 -DD620167
T+TF95)R 8_¬AO@N  O;PA2)|AO_|E&*|  O&<GD1DCN1;R 5*X  O1*XA5DCX9=) 5)$  T&($N&<LI8_.L5;|  E6M  =DDD620168
T+TG45_PE&($F&*|  H1MCF5_|L5>$I5*)  5_¬T2)$N8%Z &DA  /MDA &DA &DA &DA  UDCT1)XM2)PA6@N  5_* NEGDD620169
T+TH?1)XA8@XO5MA  -&DA &E?C5() &DA  &DA &DA-&<|O5(¬  R1;.S&FA &DA &DA  &DA &DA &DASO*$  N1%U 7HYDD620170
T+TIU14A &DA &FA  O*$N1%XG9(XE&FA  &DA &DA &DA &DA  &E?L8>( &DA &DA  &DA-&(|E>( QDA  &D  E %DD620171
T+THV&DA &DA &DA  &DA &DA O@LE4=¬  X96?X9=) &*¬X979  2*J 5%K 5@-ML;I  )&*|O&<LE4@PT1N?  D9(* L -DD620172
T+T.-&<$F8=( 1%R  =&<$R5_J 5($D9(|  EPUCT879 8*R 5($  D9(|EO*XE5=¬X94A  &DA &*¬X979 2*J  5%U =Q&DD620173
T+T<$&(¬R5%¬RO)J  8*R 6*PP&DCD1)¬  R1;.S&FCE5*J-&(.  E:DCT5UCI5)¬U84C  R1;.P5_PS1MA &DA  1)M "ZODD620174
```

```
DD62     3340 CE DISK EDITOR        MOD 12
                             OBJECT CARD LISTING
CL  1 THROUGH 16  CL 17 THROUGH 32  CL 33 THROUGH 48  CL 49 THROUGH 64  CL 65 THROUGH 80  CL 81 THROUGH 96

T+T(D8@PR&<|O5*$  I1=LR1MCR1*|D6*J  ,&($P8@XO5;I O)X  E;UA O'¬U&D_.K4A  &DA &DA(1;¬A5(¬  LIM  ),HDD620175
T+T+JUDCC5=J 16?  8@|COE"A)&DCU1*(  K4_.&DA &DA &D7  E9@CM5*|E&FA 9<L  T&<|1G||,1¬A,K4_  )9<& #9&DD620176
T+T;(8=).K4_ &DA  &DA L*PXO)LP4@N  QDCU1*|X@¬J,*¬E  ,K4_.PMA/QMCC2<G  I5MCO*|/ &($R&DA  /UM  ETHDD620177
T+T&GO@TA2)N @¬.  O&DCO6MA QDE O@T  A2)N 8>)D94A &DA  &DA(6*PT9(XN&*|  D&*|H1MCMO*XN&($  P8@U KB4DD620178
T+TJB5_N 5<PN9E7  E5;|E6MCC2<GI5MC  I5<GG1MCCO)XD&D7  4=DCH1;) 1<XG2;|  SP*PN8@PR&($N1MC  R1)* 89 DD620179
T+TJ*4@GC1MCR1*|  D6*J &DA &DA &DA  &DA &*|H1MCF5_|  L5>$I5*) O)XE&<P  XO)LP4@PS;UA &DA  &D  *K@DD620180
T+TK8&DA &DA PDA  .K4_.&DA &DA &DA  L*GD1DCT2<N 1<P  S2)XE1DCC5_LM1)P  TP)V 9=¬X94CX9=¬  X9=* O3@DD620181
T+TL3K4_.K4A &DA  &DA &DA &DA &DA  &DA &DA 8>.W&IG  CE*GD&DA &CA &D7  T9(XN8UCO5MCS8>R  @*< *HUDD620182
T+TM>&<GN1DCI1E7  E&DA &D7CO;LS1;|  6*PP8UCT5UC81MC  W6*XT8@PN&($N&<L  I8_I)94A &DA &DA  (6*M 7:<DD620183
T+TNZ6=LR5MCT5UC  T2<N 5<GI5MCO5*|  I5_N 5<PN9E7C5_P  F2*¬U6*N O@TA5*¬  E8UCC5_LP4@PT1MC  O5M  )$YDD620184
T+TOU1<XS4U_ &DA  :;$U&(LU8>( 2)-  L&<LC5*CT5UCP9*(  8@TE5DCI5MCE1%$  EO=(.&*|Y5@N 94C  A5*& 79MDD620185
T+TP¬&<LE5*XE8>I  1)PD&*|D&(XE8*L  R5MCT5UCHO*XN&($  P8@XO5MCM1)PUK4C  E&)XO6MCI5MCO5*|  I5_M $B&DD620186
T+T&E&FA-&(XE8*T  P1MA&&<TI84CE5*J  &DA U&GD1DCI5;P  A4@XD&*$H1)N 9*.  I5*) *¬L7@MCF5_V  2)M N9&DD620187
T+TKN5*LT1)PT1)V  5*PX84CR1)¬LO*|  E&(XEO*$R1DA &DA  &DA &DA &DA &*¬  4@MC18UCN5>( 2)N  8@- MC-DD620188
T+TE&1MCR1*GD&(L  O1<N.5*LT&|)7*|E  2)PT5UCR1*GD&(L  O1<N L;.E1MCU8%P  R8UCG9<XD1MA &DA  O_< LL*DD620189
T+T$.5%|K&|GOPMC  A5*J 6*PS1;( 2<G  L64 *E- O"4OA6 H  ?*H H ?H&|@HBB-¬  B &H78-HC4-DC$&  |H OZODD620190
T+T*F JO* HBW <  A SY- $-& *B&BJ$  2/1N8D G U U)>M  AOA I<? # @BGBL.  /OHEJO8 |@ *&D  BBCU PL4DD620191
T+T*F JO* HBW <  A SY- $-& *B&BJ$  2/1N8D G U U)>M  AOA I<? # @BGBL.  /OHEJO8 |@ *&D  BBCU PL4DD620191
TG3*WB G*@Z C@C%  *O-HH *MAAIO ....  * OHJ @BG /.&/O6  ...............  ...............  ....;BYDD620192
****************  ****************  ****************  ****************  ****************  ****    DD620193
................  ................  ................  ................  ................  * ...   DD620194
* ............334  O CE DISK EDITOR                                                                 
****************  ****************  ****************  ****************  ****************  ****    DD620195
................  ................  ................  ................  ................  * ...   DD620196
* CONTROL RECORD  ........MEANING   AND USE ........
```

OBJECT CARD LISTING

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

*                                                                                  *     DD620197
* $DUP FFTT       COPY FROM DRIVE   FF TO DRIVE TT.   FF AND TT CAN B   E D1 ORD2.         *     DD620198
* $ADD            ADD A PROGRAM DE  CK OR DECKS.                                           *     DD620199
* $LST            LIST PROGRAMS ON  DISK.                                                  *     DD620200
* $DELXXX,YYY     DELETE PROGRAMS   XXX,YYY FROM DIS  K.                                   *     DD620201
* $REPXXX         ADD REP CARDS ET  C. TO A PROGRAM,    E  CARD MUST    FOLLOW REPS.       *     DD620202
* $CONFIG         TO CHANGE CPU, U  DT, OR CHAIN IMA  GE.  E CARD MUST  BE THE LAST CAR   D. *   DD620203
* $CMP            COMPRESS DISK                                                            *     DD620204
****************  ****************  ****************  ****************  ****************  ****   DD620205
EB95*E7*=¬DC"PH$  ="7M&F|   |   C    F%  ASC   R A    SO   Q                 17340630750  50476*#8DD620206
```

LAST PAGE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                            2 *
                            3         DECK  4
                            4         SEQ   0
                            5 DD9     START 0
                            6         TREP
                0000        7         ORG   X'A00'
                0A00        8
                            9 ************ SECTION PREFACE  ****************************************
                           10
0A00 DD90       0A01       11         DC    XL2'DD90'      PROGRAM ID
0A02 00         0A02       12         DC    XL1'0'         SECTION FLAGS
0A03 00         0A03       13         DC    XL1'0'         CURRENT ROUTINE NUMBER
0A04 0000       0A05       14         DC    XL2'0'         RESERVED
0A06 0A0D       0A07       15         DC    AL2(RTN1)      ADDRESS OF FIRST ROUTINE PREFIX
0A08 0000       0A09       16         DC    XL2'0'         RESERVED
0A0A C15000     0A0C       17 SPUT    DC    XL3'C15000'    SPUT
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                           19 *          ROUTINE NO. 01, READ HOME ADDRESS(EVEN, ODD)
                           20 *                        RECORD 0 ON ALL CYLINDERS AND
                           21 *                        INITIALIZE EACH TRACK WITH 48 SECTORS
                           22 *
                           23 *          USE SSW 13 TO CAUSE EACH READ HA & RO TO BE DONE 10 TIMES
                           24 *          IF AN ERROR OCCURS WHILE READING
                           25 *
                           26 *          USE SSW 14 TO CAUSE EACH READ HA & RO TO BE DONE 10 TIMES
                           27 *          WHEN THERE ARE NO ERRORS.
                           28 *
0A0D 01         0A0D       29 RTN1    DC    XL1'01'        ROUTINE NUMBER
0A0E 00         0A0E       30         DC    XL1'0'         ROUTINE FLAGS
0A0F FFFF       0A10       31         DC    XL2'FFFF'      LAST ROUTINE
                           32 *
                           33 *
                           34 *        BLANK OUT THE WRITE FIELD
                           35 *
                           36 *
0A11 F2 80 1E              37 JMP     JC    DONE,X'80'     DO THIS ONLY ONCE
0A14 C2 01 0030            38         LA    48,XR1         LOOPS 48 TIMES
0A18 C2 02 3000            39         LA    BUFFER,XR2     XR2 POINTS TO THE DATA FIELD
0A1C BC 40 FF              40 CLEAR   MVI   255(,XR2),X'40'
0A1F AC FE FE FF           41         MVC   254(255,XR2),255(,XR2)   BLANK 256 BYTES AT A TIME
0A23 E2 02 FF              42         LA    255(,XR2),XR2
0A26 36 01 17F4            43         A     MINONE,XR1
0A2A C0 01 0A1C            44         BNZ   CLEAR
0A2E 3C 87 0A12            45         MVI   JMP+1,X'87'
                0A32       46 DONE    EQU   *
0A32 0C 04 0FF2 0FED       47         MVC   NAA(5),FAA       SETUP INITIAL ALTERNATE LOCATION
                           48
0A38 C0 87 021A            49         B     PRINT            TO PRINT TITLE
0A3C 42         0A3C       50         DC    XL1'42'          FLAGS
0A3D 23         0A3D       51         DC    IL1'35'          LENGTH
0A3E 1182       0A3F       52         DC    AL2(MSG1)        MESSAGE ADDRESS
0A40 C1E1       0A41       53         DC    XL2'C1E1'        MESSAGE ID
                           54
0A42 C0 87 021A            55 RTN1A   B     PRINT            TO PRINT INSTRUCTIONS
0A46 01         0A46       56         DC    XL1'01'          FLAGS
0A47 56         0A47       57         DC    IL1'86'          LENGTH
0A48 11D8       0A49       58         DC    AL2(MSG2)        MESSAGE ADDRESS
0A4A C0 87 021A            59         B     PRINT
0A4E 01         0A4E       60         DC    XL1'01'
0A4F 28         0A4F       61         DC    IL1'43'
0A50 1203       0A51       62         DC    AL2(MSG3)
0A52 C0 87 021A            63         B     PRINT
0A56 06         0A56       64         DC    XL1'06'
0A57 28         0A57       65         DC    IL1'43'
0A58 122E       0A59       66         DC    AL2(MSG4)
                           67
0A5A C0 87 0222            68         B     HALT             HALT TO SET SWITCHES
0A5E C1E1       0A5F       69         DC    XL2'C1E1'
                           70                                ARE ANY ON?
0A60 39 60 020C            71         TBF   SBYTE4,SSW21+SSW22
0A64 F2 90 14              72         JF    SETUP            NO--PRINT ERROR INDICATING THAT
0A67 C0 87 021A            73 PERROR  B     PRINT
0A68 C6         0A68       74         DC    XL1'C6'
0A6B 28         0A6C       75         DC    IL1'43'
0A6C 2B         0A6E       76         DC    AL2(MSG7)
0A6D 1317       0A70       77         DC    XL2'C101'
0A6F C101                  78         B     HALT
0A71 C0 87 0222            79         DC    XL2'C101'
0A75 C101       0A76       80         B     RTN1A
0A77 C0 87 0A42            81
                           82 SETUP   MVI   SELCON,X'C1'
0A7B 3C C1 0A96            83         TBN   SBYTE4,SSW21     IS DRIVE 1 SELECTED?
0A7F 38 40 020C            84         JT    SELECT
0A83 F2 10 0C              85         TBN   SBYTE4,SSW22     IS DRIVE 2 SELECTED?
0A86 38 20 020C
```

DD90 3340 DATA MODULE INITIALIZER-- MODEL 12

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   0A8A C0 90 0A67              86        BF     PERROR
   0A8E 3C C2 0A96              87        MVI    SELCON,X'C2'
                                88 *      J      SELECT
                                89 *      SPACE
                                90 *OT2   TBN    SBYTE4,SSW23          IS DRIVE 3 SELECTED?
                                91 *      JF     NOT3
                                92 *      MVI    SELCON,X'D1'
                                93 *      J      SELECT
                                94 *      SPACE
                                95 *OT3   TBN    SBYTE4,SSW24          IS DRIVE 4 SELECTED?
                                96 *      BF     PERROR
                                97 *      MVI    SELCON,X'D2'
                                98 *      SPACE
   0A92 C0 87 1318              99 SELECT B      SELDSK                GO SETUP FOR DRIVE SELECTED
   0A96 00              0A96   100 SELCON DC     XL1'00'               FILLER
   0A97 C0 87 0A9B             101        B      *+4
                               102
   0A9B 3C 00 10C5             103        MVI    RECLSW,0              ZERO RECALIBRATE SWITCH
   0A9F 0C 00 1249 0A96        104        MVC    MSG5A(1),SELCON       SETUP PRINT MESSAGE WITH DRIVE #
   0AA5 38 00 1249             105        TBN    MSG5A,X'00'
   0AA9 F2 90 06               106        JF     MAKPRT
   0AAC 0E 00 1249 13E7        107        ALC    MSG5A(1),TWO
   0AB2 3A F0 1249             108 MAKPRT SBN    MSG5A,X'F0'
                               109
   0AB6 C0 87 021A             110        B      PRINT                 PRINT DRIVE # INITIALIZATION ON
   0ABA 42              0ABA   111        DC     XL1'42'
   0ABB 33              0ABB   112        DC     IL1'51'
   0ABC 1261            0ABD   113        DC     AL2(MSG5)
   0ABE C1E2            0ABF   114        DC     XL2'C1E2'
   0AC0 C0 87 021A             115        B      PRINT
   0AC4 06              0AC4   116        DC     XL1'06'
   0AC5 27              0AC5   117        DC     IL1'39'
   0AC6 1288            0AC7   118        DC     AL2(MSG6)
   0AC8 C0 87 0222             119        B      HALT
   0ACC C1E2            0ACD   120        DC     XL2'C1E2'
                               121
   0ACE 38 80 0233             122        TBN    UTAB+1,X'80'          RUNNING FROM DISK?
   0AD2 F2 10 08               123        JT     DISK
   0AD5 31 C5 13ED             124        LIO    XREG,X'C5'            NO-RUNNING FROM CARDS
   0AD9 31 C5 13EF             125        LIO    SVPREQ,X'C5'          THEREFORE SET SVC REQ LATCH
                               126 *                                   (THIS ALLOWS USAGE OF 12 MBYTE
                               127 *                                    DATA MODULES--LATCH AUTOMATICALLY
                               128 *                                    SET WHEN IPL IS FROM 3340)
   0ADD 3C 00 10C4             129 DISK   MVI    ERRCTR,0              ZERO THE READ ERROR COUNTER
   0AE1 3C 01 0BE5             130        MVI    TYPE,X'01'            START WITH READ HA-R0 EVEN
   0AE5 3C 01 0C4D             131        MVI    SPECWT,X'01'          SETUP FOR EVEN                *
   0AE9 3C 02 0C61             132        MVI    WR0,X'02'             SETUP FOR EVEN                *
   0AED 3C 00 10C6             133        MVI    RDPASS,0              ZERO THE READ PASS SWITCH
   0AF1 3C 00 162E             134 P1A3   MVI    WDFCF+2,0             SET CONTROL FIELD TO CYL. 0
   0AF5 3C 00 1630             135 P1C3   MVI    WDFCF+4,0             SET CONTROL FIELD TO HEAD 0
   0AF9 3D FF 10C5             136        CLI    RECLSW,X'FF'          SHOULD RECAL BE BYPASSED?
   0AFD C0 81 0BAA             137        BE     SEEK
                               138
                               139
                               140 *             TEST THE DRIVE FOR READY OR ERROR PRIOR TO RECALIBRATE
                               141 *             RECALIBRATE IS DONE JUST ONCE PER PROGRAM PASS.
                               142 *
                               143
   0B01 C0 87 1452             144        B      DEVERR                TO TEST FOR NOT READY OR ERROR
   0B05 C0 87 0B09             145        B      *+4                   RETURN FOR NOT READY OR ERROR
                               146
                               147 *
                               148 *      RECALIBRATE *******
                               149 *
   0B09 C0 87 13F0             150        B      STRTIO                TO RECALIBRATE
   0B0D 00              0B0D   151        DC     XL1'0'                CONTROL CODE, (CONTROL)
   0B0E 01              0B0E   152        DC     XL1'01'               FUNCTION CODE (RECALIBRATE)
   0B0F 162C            0B10   153        DC     AL2(WDFCF)            CONTROL FIELD ADDRESS
```


DD90 3340 DATA MODULE INITIALIZER-- MODEL 12

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                               154
   0B11 C2 01 07D0             155        LA     2000,XR1              SET FOR 1 SEC. DELAY
   0B15 C0 87 142A             156 NOTDON B      SEKBSY                TO TEST FOR SEEK BUSY
   0B19 C0 87 0B58             157        B      RECLER                RETURN FOR NOT BUSY
   0B1D 0D 8F 1A19 1A19        158        CLC    WORK+255(144),WORK+255      DELAY
   0B23 36 01 1623             159        A      NEG1,XR1              DECREMENT COUNTER
   0B27 C0 01 0B15             160        BNZ    NOTDON                LOOP IF NOT FINISHED
                               161
   0B2B C0 87 021A             162        B      PRINT                 TO PRINT ERROR 9225
   0B2F C6              0B2F   163        DC     XL1'C6'               FLAGS
   0B30 19              0B30   164        DC     IL1'25'               LENGTH
   0B31 0B57            0B32   165        DC     AL2(ER6225)           MESSAGE ADDRESS
   0B33 C102            0B34   166        DC     XL2'C102'             MESSAGE ID
                               167
   0B35 C0 87 0222             168        B      HALT                  TO DCP ERROR HALT
   0B39 C102            0B3A   169        DC     XL2'C102'             HALT ID
   0B3B C0 87 0B35             170        B      *-6                   LOOP ON HALT
                               171
   0B3F C2E4E2E840E3D6D6 0B57  172 ER6225 DC     CL25'BUSY TOO LONG AFTER RECAL'
   0B47 40D3D6D5C740C1C6       172
   0B4F E3C5D940D9C5C3C1       172
   0B57 D3                     173
                               174 RECLER B      DEVERR                TO TEST FOR NOT READY OR ERROR
   0B58 C0 87 1452             175        B      *+4                   ERROR RETURN
   0B5C C0 87 0B60             176
                               177        MVI    RECLSW,X'FF'          SET RECALIBRATE SWITCH
   0B60 3C FF 10C5             178        B      SEEK
   0B64 C0 87 0BAA             179
                               180 *
                               181 *      THIS INCREMENTS HEAD NUMBER
                               182 *
   0B68 3D 13 1630             183 IHDCYL CLI    WDFCF+4,19            TEST FOR HEAD 19
   0B6C F2 81 0A               184        JE     ICYL                  JUMP IF YES
                               185
   0B6F 0E 00 1630 13E5        186        ALC    WDFCF+4(1),ONE        ADD ONE TO HEAD NO.
   0B75 C0 87 0BAA             187        B      SEEK                  DO NEXT TRACK
                               188
                               189 *
                               190 *      THIS INCREMENTS CYLINDER #
                               191 *
   0B79 3D 21 162E             192 ICYL   CLI    WDFCF+2,33            TEST FOR CYL. NO. 33, HD 19
   0B7D F2 81 1D               193        JE     FINI                  JUMP IF 100
   0B80 0E 00 162E 13E5        194        ALC    WDFCF+2(1),ONE        ADD ONE TO CYL. NO.
   0B86 3C 00 1630             195        MVI    WDFCF+4,0             SET HEAD TO ZERO
   0B8A 0D 03 1630 0FF8        196        CLC    WDFCF+4(4),ALTCYL     IS IT AT THE ALTERNATE CYLS
   0B90 F2 01 17               197        JNE    SEEK                  IF NOT, CONTINUE
   0B93 0C 03 1630 0FFF        198        MVC    WDFCF+4(4),NXTCYL     IF IT IS, SKIP THEM
   0B99 C0 87 0BAA             199        B      SEEK
                               200
                        0B9D   201 FINI   EQU    *
   0B9D C0 87 021A             202        B      PRINT                 TO PRINT TERMINATE MESSAGE
   0BA1 06              0BA1   203        DC     XL1'06'               FLAGS
   0BA2 18              0BA2   204        DC     IL1'24'               LENGTH
   0BA3 12EC            0BA4   205        DC     AL2(TERMSG)           MESSAGE ADDRESS
   0BA5 C0 87 022A             206        B      LOAD                  TERMINATE
   0BA9 00              0BA9   207        DC     XL1'00'
                               208
                               209 *
                               210 *      SEEK     *********
                               211 *
                               212
                        0BAA   213 SEEK   EQU    *
   0BAA 0C 04 10CF 1630        214        MVC    WRITEA+5(5),WDFCF+4   SETUP EXPECTED VALUE FOR FCCHH
   0BB0 3C 00 10D0             215        MVI    WRITEA+6,X'00'        MAKE SURE RECORD 0            *
   0BB4 C0 87 13F0             216        B      STRTIO                TO SEEK
   0BB8 00              0BB8   217        DC     XL1'0'                CONTROL CODE, (CONTROL)
   0BB9 00              0BB9   218        DC     XL1'0'                FUNCTION CODE (SEEK)
```

DD90 3340 DATA MODULE INITIALIZER-- MODEL 12

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   0B8A 162C              0B8B  219         DC    AL2(WDFCF)          CONTROL FIELD ADDRESS
                                220
   0B8C C0 87 1025              221         B     SKBUSY              GO CHECK FOR SEEK BUSY
                                222
   0BC0 C0 87 1452              223         B     DEVERR              TO TEST FOR NOT READY OR ERROR
   0BC4 C0 87 0BC8              224         B     *+4                 ERROR RETURN
                                225
   0BC8 3C 00 10C3              226 RREAD   MVI   OKCTR,0             ZERO THE OK COUNTER
   0BCC 3C FF 10E9              227         MVI   A27,X'FF'           SET READ AREA
   0BD0 0C 0C 10E8 10E9         228         MVC   A27-1(13),A27
                                229
                                230 *
                                231 *       READ HA-R0 (EVEN,ODD)   ********
                                232 *
   0BD6 3C 00 163F              233         MVI   RDFCF+9,0           SET TO READ ONE RECORD
   0BDA 0C 01 1629 10C8         234         MVC   DFDR(2),READA       SETUP DATA REGISTER
   0BE0 C0 87 13F0              235         B     STRTIO              TO READ HA & R0
   0BE4 01              0BE4    236         DC    XL1'01'             CONTROL CODE, (READ)
   0BE5 01              0BE5    237 TYPE    DC    XL1'01'             FUNCTION CODE (HA & R0)
   0BE6 1636            0BE7    238         DC    AL2(RDFCF)          CONTROL FIELD ADDRESS
                                239
   0BE8 C0 87 1075              240         B     ATTBSY              GO CHECK FOR ATTACHMENT BUSY
                                241
                                242
   0BEC C0 87 021E              243         B     UNPACK              TO UNPACK ACTUAL HA READ
   0BF0 05              0BF0    244         DC    IL1'5'              LENGTH
   0BF1 163A            0BF2    245         DC    AL2(RDFCF+4)        SOURCE
   0BF3 10FF            0BF4    246         DC    AL2(A31-10)         DESTINATION
                                247
   0BF5 C0 87 021E              248         B     UNPACK              TO UNPACK ACTUAL R0 READ
   0BF9 09              0BF9    249         DC    IL1'09'             LENGTH
   0BFA 10E9            0BFB    250         DC    AL2(A27)            SOURCE
   0BFC 111D            0BFD    251         DC    AL2(A32)            DESTINATION
                                252
   0BFE C0 87 021E              253         B     UNPACK              TO UNPACK EXPECTED HA
   0C02 05              0C02    254         DC    IL1'5'              LENGTH
   0C03 1630            0C04    255         DC    AL2(WDFCF+4)        SOURCE
   0C05 1133            0C06    256         DC    AL2(A33-10)         DESTINATION
                                257
   0C07 C0 87 021E              258         B     UNPACK              TO UNPACK EXPECTED RO
   0C0B 09              0C0B    259         DC    IL1'09'             LENGTH
   0C0C 10D3            0C0D    260         DC    AL2(A08-1)          SOURCE
   0C0E 1151            0C0F    261         DC    AL2(A34)            DESTINATION
                                262
   0C10 0C 03 10ED 1159         263         MVC   A29-12(4),EVENM     MOVE 'EVEN' INTO MESSAGE
   0C16 3D 09 0BE5              264         CLI   TYPE,X'09'          CHECK FOR ODD HA BEING DONE
   0C1A F2 01 06                265         JNE   *+9
   0C1D 0C 03 10ED 1155         266         MVC   A29-12(4),ODD       IF SO, PUT 'ODD-' INTO MESSAGE
   0C23 0D 04 163A 1630         267         CLC   RDFCF+4(5),WDFCF+4  CHECK HA READ
   0C29 F2 81 48                268         JE    CKR0                GO CHECK FOR GOOD R0
   0C2C 0D 03 163A 1630         269         CLC   RDFCF+4(4),WDFCF+4  CHECK FOR GOOD CYL AND HEAD     *
   0C32 C0 01 0D13              270         BNE   ASSIGN              *
   0C36 38 01 1636              271         TBN   RDFCF,X'01'         IS IT AN ALTERNATE THAT       *
   0C3A 39 02 1636              272         TBF   RDFCF,X'02'           IS NOT DEFECTIVE?           *
   0C3E C0 90 0D13              273         BF    ASSIGN              IF NOT, GO ASSIGN ALTERNATE   *
                                274                                                                 *
   0C42 0C 01 1629 17EC         275         MVC   DFDR(2),ABUF                                        *
   0C48 C0 87 13F0              276         B     STRTIO              ISSUE                         *
   0C4C 02              0C4C    277         DC    XL1'02'             WRITE HA                      *
   0C4D 01              0C4D    278 SPECWT  DC    XL1'01'             EVEN/ODD                      *
   0C4E 162C            0C4F    279         DC    AL2(WDFCF)                                        *
   0C50 C0 87 1075              280         B     ATTBSY              CHECK ATTACHMENT BUSY         *
   0C54 C0 87 1452              281         B     DEVERR              CHECK FOR ANY ERRORS          *
   0C58 C0 87 0C5C              282         B     *+4                                               *
                                283                                                                 *
   0C5C C0 87 13F0              284         B     STRTIO              ISSUE                         *
   0C60 02              0C60    285         DC    XL1'02'             WRITE R0 COUNT                *
   0C61 02              0C61    286 WR0     DC    XL1'02'                                           *
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   0C62 10CB              0C63  287         DC    AL2(WRITEA+1)
   0C64 C0 87 1075              288         B     ATTBSY              CHECK ATTACHMENT BUSY         *
   0C68 C0 87 1452              289         B     DEVERR              CHECK FOR ANY ERRORS          *
   0C6C C0 87 0C70              290         B     *+4                                               *
   0C70 C0 87 0BC8              291         B     RREAD               GO RE-READ HA-R0              *
                                292                                                                 *
   0C74 0D 08 10E9 10D3         294 CKR0    CLC   A27(9),A08-1        CHECK R0 READ
   0C7A C0 01 0D13              295         BNE   ASSIGN              GO ASSIGN AN ALTERNATE
   0C7E 3C 00 10C4              296 CKSW12  MVI   ERRCTR,0            ZERO THE ERROR COUNTER        *
   0C82 38 20 020A              297         TBN   SECTSW,SSW12        SHOULD CORRECT RESULTS BE PRINTED
   0C86 F2 90 08                298         JF    CK14                JUMP IF NO
                                299
   0C89 C0 87 021A              300         B     PRINT               TO PRINT RECIEVED DATA
   0C8D 02              0C8D    301         DC    XL1'02'             FLAGS
   0C8E 34              0C8E    302         DC    IL1'52'             LENGTH
   0C8F 111D            0C90    303         DC    AL2(A32)            MESSAGE ADDRESS
                                304
   0C91 38 08 020A              305 CK14    TBN   SECTSW,SSW14        SHOULD READ BE REPEATED 10 TIMES?
   0C95 F2 10 04                306         JT    REP10               BRANCH IF OFF
   0C98 C0 87 0CAE              307 CKTYPE  EQU   *
                                308         B     WRITE               GO DO THE WRITE
                                309
   0C9C 0E 00 10C3 13E5         310 REP10   ALC   OKCTR(1),ONE        ADD ONE TO THE OK COUNTER
   0CA2 3D 0A 10C3              311         CLI   OKCTR,10            TEST FOR 10 PASSES
   0CA6 C0 01 0BCC              312         BNE   RREAD+4             REPEAT READ IF NOT
   0CAA C0 87 0C98              313         B     CKTYPE              CHECK FOR NEXT ODD OR EVEN
                                314
                                315 *
                                316 *       WRITE       ****************
                                317 *
                        0CAE    318 WRITE   EQU   *
   0CAE 3D 09 0BE5              319         CLI   TYPE,X'09'          IS IT ON THE ODD PART
   0CB2 F2 01 4E                320         JNE   SETYPE              IF NOT, DON'T DO THE COMP WRITE
   0CB5 0C 04 163F 1621         321         MVC   RDFCF+9(5),RKDN     SETUP CONTROL FIELD
   0CBB 0C 01 1629 17EC         322         MVC   DFDR(2),ABUF
   0CC1 C0 87 13F0              323         B     STRTIO              TO WRITE
   0CC5 02              0CC5    324         DC    XL1'02'             CONTROL CODE-
   0CC6 08              0CC6    325         DC    XL1'08'             FUNCTION CODE-COUNT KEY DATA COMP
   0CC7 1636            0CC8    326         DC    AL2(RDFCF)
                                327
   0CC9 C0 87 1075              328         B     ATTBSY              GO CHECK ATTACHMENT BUSY
   0CCD C0 87 1452              329         B     DEVERR              CHECK FOR ERROR
   0CD1 C0 87 0CD5              330         B     *+4                 GO INDICATE WRITE ERROR
                                331
                                332 *
                                333 *       READ VERIFY    ****************
                                334 *
   0CD5 0C 04 163F 1621         335         MVC   RDFCF+9(5),RKDN
   0CDB C0 87 13F0              336         B     STRTIO              TO READ                       *
   0CDF 01              0CDF    337         DC    XL1'01'             *
   0CE0 03              0CE0    338         DC    XL1'03'             VERIFY                        *
   0CE1 1636            0CE2    339         DC    AL2(RDFCF)          *
                                340                                                                 *
   0CE3 C0 87 1075              341         B     ATTBSY              GO CHECK ATTACHMENT BUSY      *
   0CE7 C0 87 1452              342         B     DEVERR              GO CHECK FOR ERRORS           *
   0CEB C0 87 0CEF              343         B     *+4                                               *
                                344                                                                 *
                                345 *
                                346 *       THIS WILL SETUP FOR READ HA ODD OR GO INCREMENT HEAD,CYL
                                347 *
   0CEF 3D 09 0BE5              348         CLI   TYPE,X'09'          IF ODD JUST DONE, GO INCREMENT HD,CYL
   0CF3 3C 01 0BE5              349         MVI   TYPE,X'01'
   0CF7 3C 01 0C4D              350         MVI   SPECWT,X'01'                                        *
   0CFB 3C 02 0C61              351         MVI   WR0,X'02'                                           *
   0CFF C0 81 0B68              352         BE    IHDCYL
                                353
   0D03 3C 09 0BE5              354 SETYPE  MVI   TYPE,X'09'          OTHERWISE SETUP FOR ODD AND REPEAT
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   0D07 3C 09 0C4D             355          MVI   SPECWT,X'09'          SETUP FOR ODD                 *
   0D0B 3C 06 0C61             356          MVI   WRO,X'06'             SETUP FOR ODD                 *
   0D0F C0 87 0BC8             357          B     RREAD                 GO DO READ HA-RO
                               358 *
                               359 *
                               360 *        ALTERNATES MUST BE HANDLED HERE
                               361 *
                               362 *
                               363 *
                               364 *        ALTERNATES ARE ASSIGNED BY THIS SUBROUTINE
                               365 *
                               366 *
                        0D13   367 ASSIGN EQU   *
                               368 *        CHECK FOR CYLINDER 0, TRACK 0 BAD
                               369 *
   0D13 0D 03 163A 17F2        370          CLC   RDFCF+4(4),ZERO
   0D19 F2 01 14               371          JNE   NOT00
   0D1C C0 87 021A             372          B     PRINT                 PRINT DATA MODULE MUST BE REPAIRED
   0D20 C6              0D20   373          DC    XL1'C6'
   0D21 35              0D21   374          DC    IL1'53'
   0D22 1579            0D23   375          DC    AL2(MSG00)
   0D24 C103            0D25   376          DC    XL2'C103'
   0D26 C0 87 0222             377          B     HALT
   0D2A C103            0D28   378          DC    XL2'C103'
   0D2C C0 87 0D26             379          B     *-6
                               380
                        0D30   381 NOT00  EQU   *
   0D30 0C 04 1004 0FF2        382 SEKNA    MVC   ALTDCF+4(5),NAA       GET NEXT AVAILABLE ALTERNATE
   0D36 0C 00 0FE6 0000        383          MVC   ALTFLG,0                RESET ALTERNATE FLAG
   0D3C 3C 00 0FE8             384          MVI   ODDFLG,0                RESET FLAG INDICATING ODD COMMANDS
   0D40 3C 01 0D71             385          MVI   READ11,X'01'            RESET READ HA-RO TO EVEN
   0D44 C0 87 13F0             386          B     STRTIO                  SEEK TO NEXT AVAILABLE ALTERNATE
   0D48 00              0D48   387          DC    XL1'00'
   0D49 00              0D49   388          DC    XL1'00'
   0D4A 1000            0D4B   389          DC    AL2(ALTDCF)
                               390
   0D4C C0 87 1025             391          B     SK8USY                  WAIT FOR SEEK BUSY TO DROP
   0D50 C0 87 1452             392          B     DEVERR                  CHECK FOR NOT READY OR ERROR
   0D54 C0 87 0D58             393          B     *+4
                               394
   0D58 3C FF 1017             395 DOREAD   MVI   ALTROC,X'FF'            CLEAR RO COUNT FIELD
   0D5C 0C 0C 1016 1017        396          MVC   ALTROC-1(13),ALTROC
   0D62 3C 00 1009             397          MVI   ALTDCF+9,0
   0D66 0C 01 1629 101A        398          MVC   DFDR(2),ALTADR          SETUP DATA FIELD FOR RO COUNT
   0D6C C0 87 13F0             399          B     STRTIO                  ISSUE
   0D70 01              0D70   400          DC    XL1'01'                 READ
   0D71 01              0D71   401 READ11 DC    XL1'01'                 HA-RO (EVEN/ODD)
   0D72 101B            0D73   402          DC    AL2(ALTHA)
                               403
   0D74 C0 87 1075             404          B     ATTBSY                  WAIT FOR ATTACHMENT BUSY TO DROP
   0D78 39 02 101B             405          TBF   ALTHA,X'02'             MAKE SURE ALTERNATE NOT DEFECTIVE
   0D7C F2 10 03               406          JT    CKCYL
   0D7F F2 87 09               407          J     ERR                     INCREMENT TO NEXT ALT IF DEFECTIVE
   0D82 0D 03 101F 1004        408 CKCYL    CLC   ALTHA+4(4),ALTDCF+4      GOOD ALTERNATE?
   0D88 F2 81 08               409          JE    CKFLG                   YES--CONTINUE ON
   0D8B C0 87 0F88             410 ERR      B     INCALT                  GO INCREMENT FOR NEXT ALT
   0D8F CC 87 0D30             411          B     SEKNA                   NOW GO SELECT THE NEW ALTERNATE
                               412
   0D93 3D FF 0FE8             413 CKFLG    CLI   ODDFLG,X'FF'           IF ODD READ HA-ROS BEING DONE?
   0D97 F2 81 0C               414          JE    ODD1
   0D9A 3D FF 0FE6             415          CLI   ALTFLG,X'FF'
   0D9E 3C 00 0FE6             416          MVI   ALTFLG,0
   0DA2 C0 01 0F70             417          BNE   ALTODD                  GO SETUP FOR ODD HALF TRACK
                               418
   0DA6 3C 01 1000             419 ODD1     MVI   ALTDCF,X'01'            INDICATE THIS WILL BE AN ALTERNATE
   0DAA 3C 00 1005             420          MVI   ALTDCF+5,0              RECORD 0 ONLY
   0DAE 0C 01 1629 17EC        421          MVC   DFDR(2),ABUF            DATA FIELD WILL BE BLANKS
   0DB4 C0 87 13F0             422          B     STRTIO                  ISSUE
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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   0DB8 02              0DB8   423          DC    XL1'02'                 WRITE
   0DB9 01              0DB9   424 WRIT11 DC    XL1'01'                 HA-RO EVEN/ODD
   0DBA 1000            0DBB   425          DC    AL2(ALTDCF)
   0DBC C0 87 1075             426          B     ATTBSY
   0DC0 C0 87 1452             427          B     DEVERR                  GO CHECK FOR ATTACHMENT BUSY
   0DC4 C0 87 0DC8             428          B     *+4                     NOT READY/ERROR
                               429
   0DC8 3C 01 10CB             430          MVI   WRITEA+1,X'01'          INDICATE ALTERNATE
   0DCC C0 87 13F0             431          B     STRTIO                  ISSUE
   0DD0 02              0DD0   432          DC    XL1'02'                 WRITE
   0DD1 02              0DD1   433 WRIT12 DC    XL1'02'                 RECORD 0 COUNT (EVEN/ODD)
   0DD2 10CB            0DD3   434          DC    AL2(WRITEA+1)
   0DD4 C0 87 1075             435          B     ATTBSY                  WAIT FOR ATTACHMENT BUSY TO DROP
   0DD8 C0 87 1452             436          B     DEVERR                  CHECK FOR NOTREADY/ERROR
   0DDC C0 87 0DE0             437          B     *+4                     READ ERROR
                               438
   0DE0 3D 06 0DD1             439          CLI   WRIT12,X'06'            VERIFY SHOULD BE SKIPPED ON ODD
   0DE4 F2 81 14               440          JE    SKVER
   0DE7 C0 87 13F0             441          B     STRTIO                  ISSUE
   0DEB 01              0DEB   442          DC    XL1'01'                 READ
   0DEC 03              0DEC   443          DC    XL1'03'                 VERIFY (RO DATA FIELD)
   0DED 10CB            0DEE   444          DC    AL2(WRITEA+1)
   0DEF C0 87 1075             445          B     ATTBSY                  CHECK FOR ATTACHMENT BUSY
   0DF3 C0 87 1452             446          B     DEVERR                  CHECK FOR NOT READY/ERROR
   0DF7 C0 87 0DFB             447          B     *+4                     VERIFY ERROR
                               448
   0DFB 0C 01 1629 101A        449 SKVER    MVC   DFDR(2),ALTADR          SETUP FOR DATA FIELD FOR RO COUNT
   0E01 C0 87 13F0             450          B     STRTIO                  ISSUE
   0E05 01              0E05   451          DC    XL1'01'                 READ
   0E06 01              0E06   452 READ12 DC    XL1'01'                 HA-RO EVEN/ODD
   0E07 1000            0E08   453          DC    AL2(ALTDCF)
   0E09 C0 87 1075             454          B     ATTBSY                  CHECK FOR ATTACHMENT BUSY
                               455
   0E0D 3D FF 0FE8             456          CLI   ODDFLG,X'FF'            WAS ODD TRACK BEING DONE?
   0E11 3C 00 0FE8             457          MVI   ODDFLG,0
   0E15 F2 01 18               458          JNE   EVEN
   0E18 3C FF 0FE6             459          MVI   ALTFLG,X'FF'            SETUP FOR EVEN HALF TRACK
   0E1C 3C 01 0D71             460          MVI   READ11,X'01'
   0E20 3C 01 0E06             461          MVI   READ12,X'01'
   0E24 3C 01 0DB9             462          MVI   WRIT11,X'01'
   0E28 3C 02 0DD1             463          MVI   WRIT12,X'02'
   0E2C C0 87 0D58             464          B     DOREAD                  GO ISSUE THE COMMANDS
                               465
   0E30 0C 01 1629 17EC        466 EVEN     MVC   DFDR(2),ABUF            SETUP DATA BUFFER FOR BLANKS
   0E36 0C 04 1018 1621        467          MVC   ALTROC+1(5),RKDN        WRITE 48 RECORDS
   0E3C C0 87 13F0             468          B     STRTIO                  ISSUE
   0E40 02              0E40   469          DC    XL1'02'                 WRITE
   0E41 08              0E41   470          DC    XL1'08'                 COUNT KEY DATA COMPRESSED
   0E42 100F            0E43   471          DC    AL2(ALTROC-8)
   0E44 C0 87 1075             472          B     ATTBSY                  CHECK FOR ATTACHMENT BUSY
   0E48 C0 87 1452             473          B     DEVERR                  CHECK FOR NOT READY/ERROR
   0E4C C0 87 0E50             474          B     *+4                     INDICATE WRITE ERROR
                               475
   0E50 0C 04 1018 1621        476          MVC   ALTROC+1(5),RKDN        NOW SETUP FOR THE VERIFY
   0E56 C0 87 13F0             477          B     STRTIO                  ISSUE
   0E5A 01              0E5A   478          DC    XL1'01'                 READ
   0E5B 03              0E5B   479          DC    XL1'03'                 VERIFY
   0E5C 100F            0E5D   480          DC    AL2(ALTROC-8)
   0E5E C0 87 1075             481          B     ATTBSY
   0E62 C0 87 1452             482          B     DEVERR
   0E66 C0 87 0E6A             483          B     *+4
   0E6A C0 87 0F88             484          B     INCALT                  NOW INCREMENT FOR NEXT ALTERNATE
                               485 *
                               486 *        DONE WITH ALTERNATE ASSIGNMENT
                               487 *        NOW GO BACK AND SETUP THE ORIGINAL AS DEFECTIVE
                               488 *        AND USE THE CORRECT POINTERS TO THE ALTERNATE
                               489 *
                               490 *
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ERR LOC  OBJECT CODE       ADDR STMT SOURCE STATEMENT

    0E6E C0 87 13F0             491        B     STRTIO               ISSUE
    0E72 00                0E72 492        DC    XL1'00'              SEEK TO ORIGINAL
    0E73 00                0E73 493        DC    XL1'00'
    0E74 162C              0E75 494        DC    AL2(WDFCF)
    0E76 C0 87 1025             495        B     SKBUSY               WAIT FOR SEEK BUSY TO DROP
    0E7A C0 87 1452             496        B     DEVERR               CHECK FOR NOT READY/ERROR
    0E7E C0 87 0E82             497        B     *+4                  GO INDICATE SEEK ERROR
                                498
    0E82 0C 01 1629 10C8        499 SETALT MVC   DFDR(2),READA        INDICATE WHERE RO COUNT WILL GO
    0E88 C0 87 13F0             500        B     STRTIO               ISSUE
    0E8C 01                0E8C 501        DC    XL1'01'              READ
    0E8D 01                0E8D 502 CREAD  DC    XL1'01'              HA-RO EVEN/ODD
    0E8E 1636              0E8F 503        DC    AL2(RDFCF)
    0E90 C0 87 1075             504        B     ATTBSY               WAIT FOR ATTACHMENT BUSY TO DROP
    0E94 C0 87 1452             505        B     DEVERR               CHECK FOR NOT READY/ERROR
    0E98 C0 87 0E9C             506        B     *+4                  INDICATE READ ERROR
                                507
    0E9C 0C 03 163A 1630        508        MVC   RDFCF+4(4),WDFCF+4   MAKE SURE HA IS OK
    0EA2 3C 02 1636             509        MVI   RDFCF,X'02'          INDICATE DEFECTIVE PRIMARY
    0EA6 0C 01 1629 17EC        510        MVC   DFDR(2),ABUF         DATA FIELD WILL BE BLANKS
    0EAC C0 87 13F0             511        B     STRTIO               ISSUE
    0EB0 02                0EB0 512        DC    XL1'02'              WRITE
    0EB1 01                0EB1 513 CWRITE DC    XL1'01'              HA-RO EVEN/ODD
    0EB2 1636              0EB3 514        DC    AL2(RDFCF)           FLAGGED AS DEFECTIVE
    0EB4 C0 87 1075             515        B     ATTBSY               WAIT FOR ATTACHMENT BUSY TO DROP
    0EB8 C0 87 1452             516        B     DEVERR               NOT READY/ERROR?
    0EBC C0 87 0EC0             517        B     *+4                  INDICATE WRITE ERROR
                                518
    0EC0 3C 02 10E1             519        MVI   A27-8,X'02'          INDICATE DEFECTIVE
    0EC4 3C 08 10E9             520        MVI   A27,X'08'            DATA FIELD LENGTH IS 8
    0EC8 3C 00 10E8             521        MVI   A27-1,X'00'
    0ECC 0C 03 10E5 1004        522        MVC   A27-4(4),ALTDCF+4    USE CORRRECT ALTERNATE ADDRESS
    0ED2 3C 00 10E6             523        MVI   A27-3,X'00'          MAKE SURE RECORD 0
    0ED6 C0 87 13F0             524        B     STRTIO               ISSUE
    0EDA 02                0EDA 525        DC    XL1'02'              WRITE
    0EDB 02                0EDB 526 CWRIT1 DC    XL1'02'              COUNT FIELD FOR RO
    0EDC 10E1              0EDD 527        DC    AL2(A27-8)
    0EDE C0 87 1075             528        B     ATTBSY               WAIT FOR ATTCH BUSY TO DROP
    0EE2 C0 87 1452             529        B     DEVERR               ANY ERRORS?
    0EE6 C0 87 0EEA             530        B     *+4
                                531
    0EEA 3D 06 0EDB             532        CLI   CWRIT1,X'06'         VERIFY SHOULD BE SKIPPED ON ODD
    0EEE F2 81 14               533        JE    SKVER1
    0EF1 C0 87 13F0             534        B     STRTIO               ISSUE
    0EF5 01                0EF5 535        DC    XL1'01'              READ
    0EF6 03                0EF6 536        DC    XL1'03'              VERIFY
    0EF7 10E1              0EF8 537        DC    AL2(A27-8)           (TO VERIFY RO DATA FIELD)
    0EF9 C0 87 1075             538        B     ATTBSY               CHECK FOR ATTACHMENT BUSY
    0EFD C0 87 1452             539        B     DEVERR               CHECK NOT READY/ERROR
    0F01 C0 87 0F05             540        B     *+4                  INDICATE VERIFY ERROR
                                541
    0F05 0C 01 1629 10C8        542 SKVER1 MVC   DFDR(2),READA        DATA FIELD WILL CONTAIN RO COUNT
    0F0B C0 87 13F0             543        B     STRTIO               ISSUE
    0F0F 01                0F0F 544        DC    XL1'01'              READ
    0F10 01                0F10 545 CREAD1 DC    XL1'01'              HA-RO EVEN/ODD
    0F11 1636              0F12 546        DC    AL2(RDFCF)
    0F13 C0 87 1075             547        B     ATTBSY               CHECK FOR ATTACHMENT BUSY
    0F17 C0 87 1452             548        B     DEVERR               CHECK FOR NOT READY/ERROR
    0F1B C0 87 0F1F             549        B     *+4
                                550
    0F1F 3D FF 0FE7             551        CLI   FLAG2,X'FF'          HAS ODD HALF TRACK BEEN DONE?
    0F23 3C 01 0E8D             552        MVI   CREAD,X'01'          RESET FOR EVEN HALF TRACK
    0F27 3C 01 0EB1             553        MVI   CWRITE,X'01'
    0F2B 3C 02 0EDB             554        MVI   CWRIT1,X'02'
    0F2F 3C 01 0F10             555        MVI   CREAD1,X'01'
    0F33 3C 00 0FE7             556        MVI   FLAG2,X'00'
    0F37 F2 01 1E               557        JNE   DOOOD                NO-GO DO ODD HALF TRACK ASSIGNMENT
                                558
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ERR LOC  OBJECT CODE       ADDR STMT SOURCE STATEMENT

    0F3A C0 87 021E             559        B     UNPACK               UNPACK THE
    0F3E 04                0F3E 560        DC    IL1'4'                DEFECTIVE TRACK
    0F3F 163A              0F40 561        DC    AL2(RDFCF+4)
    0F41 15C8              0F42 562        DC    AL2(MSGBAD)
    0F43 C0 87 021E             563        B     UNPACK               UNPACK THE
    0F47 04                0F47 564        DC    IL1'4'                ALTERNATE TRACK
    0F48 10E5              0F49 565        DC    AL2(A27-4)
    0F4A 15E0              0F4B 566        DC    AL2(MSGOOD)
    0F4C C0 87 021A             567        B     PRINT                PRINT THE TRACK
    0F50 06                0F50 568        DC    XL1'06'               AND ITS ALTERNATE
    0F51 31                0F51 569        DC    IL1'49'
    0F52 15F1              0F53 570        DC    AL2(MSGASN)
    0F54 C0 87 0B68             571        B     IHDCYL               GO INCREMENT HEAD AND CYL
                                572
    0F58 3C 09 0E8D             573 DOOOD  MVI   CREAD,X'09'          OTHERWISE SETUP FOR ODD HALF TRACK
    0F5C 3C 09 0EB1             574        MVI   CWRITE,X'09'
    0F60 3C 06 0EDB             575        MVI   CWRIT1,X'06'
    0F64 3C 09 0F10             576        MVI   CREAD1,X'09'
    0F68 3C FF 0FE7             577        MVI   FLAG2,X'FF'
    0F6C C0 87 0E82             578        B     SETALT               GO DO ODD HALF TRACK
                                579
                                580 *
                                581 *      THIS WILL SETUP AND CHECK THE ODD HALF TRACK WHICH ENSURES
                                582 *       THAT THIS IS A GOOD ALTERNATE TRACK
                                583 *
                           0F70 584 ALTODD EQU   *
    0F70 3C FF 0FE8             585        MVI   ODDFLG,X'FF'
    0F74 3C 09 0D71             586        MVI   READ11,X'09'
    0F78 3C 09 0E06             587        MVI   READ12,X'09'
    0F7C 3C 09 0DB9             588        MVI   WRIT11,X'09'
    0F80 3C 06 0DD1             589        MVI   WRIT12,X'06'
    0F84 C0 87 0D58             590        B     DOREAD
                                591
                                591
                                591
                                592 *
                                593 *      THIS SUBROUTINE WILL INCREMENT ALTERNATE
                                594 *      CYLINDER AND HEAD VALUES
                                595 *
    0F88 34 08 0FC9             596 INCALT ST    EINC+3,ARR           SAVE FOR RETURNING
    0F8C 0D 03 0FF2 0FF7        597        CLC   NAA(4),LAA           HAS THE LAST ALTERNATE BEEN USED?
    0F92 F2 81 1D               598        JE    NOMORE
    0F95 3D 13 0FF2             599        CLI   NAA,19               HEAD 19?
    0F99 F2 81 09               600        JE    INCYL
    0F9C 0E 00 0FF2 13E5        601        ALC   NAA(1),ONE
    0FA2 F2 87 21               602        J     EINC
    0FA5 0E 01 0FF0 13E5        603 INCYL  ALC   NAA-2(2),ONE         INCREMENT CYLINDER
    0FAB 3C 00 0FF2             604        MVI   NAA,0                SET HEAD BACK TO 0
    0FAF F2 87 14               605        J     EINC
    0FB2 C0 87 021A             606 NOMORE B     PRINT                PRINT NO MORE ALTERNATES
    0FB6 C6                0FB6 607        DC    XL1'C6'
    0FB7 1C                0FB7 608        DC    IL1'28'
    0FB8 0FE5              0FB9 609        DC    AL2(MSGALT)
    0FBA C104              0FBB 610        DC    XL2'C104'
    0FBC C0 87 0222             611        B     HALT
    0FC0 C104              0FC1 612        DC    XL2'C104'
    0FC2 C0 87 0FBC             613        B     *-6
    0FC6 C0 87 0000             614 EINC   B     *-*                  RETURN
                                615
                                615
                                615
                                616
    0FCA D5D640D4D6D9C540  0FE5 617 MSGALT DC    CL28'NO MORE ALTERNATES AVAILABLE'
    0FD2 C1D3E3C5D9D5C1E3       617
    0FDA C5E240C1E5C1C9D3       617
    0FE2 C1C2D3C5               617
    0FE6 00                0FE6 618 ALTFLG DC    XL1'00'
    0FE7 00                0FE7 619 FLAG2  DC    XL1'00'
```

DD90 3340 DATA MODULE INITIALIZER-- MODEL 12

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
   OFE8 00                OFE8  620 ODDFLG DC    XL1'00'
                                621 *
                                622 *       VALUES USED IN ALTERNATE TRACK ASSIGNMENT
                                623 *
   OFE9 00                OFE9  624         DC    XL1'00'             FIRST
   OFEA 0022              OFEB  625         DC    IL2'34'              AVAILABLE (12 MBYTE ONLY)**********
   OFEC 0000              OFED  626 FAA     DC    IL2'00'              ALTERNATE (C34,  H0)
                                627
   OFEE 00                OFEE  628         DC    IL1'00'             NEXT
   OFEF 0022              OFF0  629         DC    IL2'34'              AVAILABLE (12 MBYTE ONLY)**********
   OFF1 0000              OFF2  630 NAA     DC    IL2'00'              ALTERNATE
                                631
   OFF3 00                OFF3  632         DC    IL1'00'             LAST
   OFF4 0022              OFF5  633         DC    IL2'34'              AVAILABLE (12 MBYTE ONLY)*********
   OFF6 0008              OFF7  634 LAA     DC    IL2'08'              ALTERNATE (C34,  H08)
   OFF8 0022              OFF9  635         DC    IL2'34'             ALTERNATES START HERE
   OFFA 0000              OFFB  636 ALTCYL  DC    XL2'00'
   OFFC 0022              OFFD  637         DC    IL2'34'             NEXT NON-ALT STARTS HERE
   OFFE 0008              OFFF  638 NXTCYL  DC    IL2'08'
                                639
                          1000  640 ALTDCF  EQU   *                   ALTERNATE CONTROL FIELD
   1000 00                1000  641         DC    XL1'00'             FLAG
   1001 0000              1002  642         DC    XL2'00'             CYLINDER
   1003 0000              1004  643         DC    XL2'00'             HEAD
   1005 00                1005  644         DC    XL1'00'             R
   1006 00                1006  645         DC    XL1'00'             KEY LENGTH
   1007 0008              1008  646         DC    IL2'8'              DATA LENGTH
   1009 00                1009  647         DC    XL1'00'             N
                                648
   100A 00000000000000000 1017  649 ALTROC DC    XL14'00'            COUNT FIELD FOR RO
   1012 000000000000      1018  650         DC    XL1'00'
   1019 100F              101A  651 ALTADR DC    AL2(ALTROC-8)
                          1018  652 ALTHA   EQU   *                   HOME ADDRESS FIELD
   101B 00000000000000000 1024  653         DC    10XL1'00'
   1023 0000                    653
```


DD90 3340 DATA MODULE INITIALIZER-- MODEL 12

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                                655 *
                                656 *       THIS SUBROUTINE CHECKS SEEK BUSY CONDITION
                                657 *
   1025 34 08 1074              658 SKBUSY  ST    EBSY+3,ARR          SAVE FOR RETURNING
   1029 C2 01 07D0              659         LA    2000,XR1            SET FOR 1 SEC. DELAY
   102D C0 87 142A              660         B     SEKBSY              TO TEST FOR SEEK BUSY
   1031 C0 87 1071              661         B     EBSY                RETURN TO MAIN PROGRAM
   1035 0D 8F 1A19 1A19         662         CLC   WORK+255(144),WORK+255   DELAY
   103B 36 01 1623              663         A     NEG1,XR1            DECREMENT COUNTER
   103F C0 01 1029              664         BNZ   SKBUSY+4            LOOP IF NOT DONE
                                665
   1043 C0 87 021A              666         B     PRINT               TO PRINT ERROR 9255
   1047 C6                1047  667         DC    XL1'C6'             FLAGS
   1048 1A                1048  668         DC    IL1'26'             LENGTH
   1049 1070              104A  669         DC    AL2(ER6255)         MESSAGE ADDRESS
   104B C105              104C  670         DC    XL2'C105'           MESSAGE ID
                                671
   104D C0 87 0222              672         B     HALT                TO DCP ERROR HALT
   1051 C105              1052  673         DC    XL2'C105'           HALT ID
   1053 C0 87 104D              674         B     *-6                 LOOP ON HALT
                                675
   1057 C2E4E2E840E3D6D6  1070  676 ER6255 DC    CL26'BUSY TOO LONG AFTER A SEEK'
   105F 40D3D5D5C740C1C6        676
   1067 E3C5D5D540C140E2C5      676
   106F C5D2
   1071 C0 87 0000              677 EBSY    B     *-*                 RETURN
                                678 *
                                679 *       THIS SUBROUTINE TESTS ATTACHMENT BUSY
                                680 *
   1075 34 08 10C2              681 ATTBSY  ST    EATT+3,ARR          SAVE FOR RETURNING
   1079 C2 01 0190              682         LA    400,XR1             SET FOR 200 MS. DELAY
   107D C0 87 143E              683         B     ATHBSY              TO TEST FOR ATTACHMENT BUSY
   1081 C0 87 108F              684         B     EATT                RETURN FOR NOT BUSY
   1085 0D 8F 1A19 1A19         685         CLC   WORK+255(144),WORK+255   DELAY
   108B 36 01 1623              686         A     NEG1,XR1            DECREMENT COUNTER
   108F C0 01 1079              687         BNZ   ATTBSY+4            LOOP IF NOT DONE
   1093 C0 87 021A              688         B     PRINT               TO PRINT ERROR 9275
   1097 C6                1097  689         DC    XL1'C6'             FLAGS
   1098 18                1098  690         DC    IL1'24'             LENGTH
   1099 10BE              109A  691         DC    AL2(ER6275)         MESSAGE ADDRESS
   109B C106              109C  692         DC    XL2'C106'           MESSAGE ID
                                693
   109D C0 87 0222              694         B     HALT                TO DCP ERROR HALT
   10A1 C106              10A2  695         DC    XL2'C106'           HALT ID
   10A3 C0 87 109D              696         B     *-6                 LOOP ON HALT
                                697
   10A7 C1E3E3C1C3C8D4C5  10BE  698 ER6275 DC    CL24'ATTACHMENT BUSY TOO LONG'
   10AF D5E340C2E4E2E840        698
   10B7 E3D6D640D3D6D5C7        698
                                699
   10BF C0 87 0000              700 EATT    B     *-*                 RETURN TO MAIN PROGRAM
   10C3 00                10C3  701 OKCTR   DC    XL1'0'
   10C4 00                10C4  702 ERRCTR  DC    XL1'0'
   10C5 00                10C5  703 RECLSW  DC    XL1'0'
   10C6 00                10C6  704 RDPASS  DC    XL1'0'
   10C7 10E1              10C8  705 READA   DC    AL2(A27-8)           READ ADDRESS
   10C9 10D4              10CA  706 WRITEA  DC    AL2(A08)            WRITE ADDRESS
   10CB C6C3C3C8C8        10CF  707         DC    CL5'FCCHH'
   10D0 00                10D0  708         DC    XL1'0'
   10D1 00                10D1  709         DC    XL1'0'
   10D2 0008              10D3  710         DC    IL2'08'             DATA LENGTH FOR RO
                          10D4  711 A08     EQU   *                   RO DATA TO BE WRITTEN
   10D4 0000              10D5  712         DC    XL2'0'
   10D6 C3C3C8C8          10D9  713 A19     DC    CL4'CCHH'
   10DA 10DA              10DB  714 TBLENA  DC    AL2(*)
   10DC C6C3C3C8C8C6C3C3  10E9  715 A27     DC    CL14'FCCHHFCCHH0008'
   10E4 C8C8F0F0F0F8            715
   10EA 60E7E7E76040C8C1  10F9  716 A29     DC    CL16'-XXX- HA RD XXXX'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    10F2 40D9C440E7E7E7E7          716
    10FA E7E7E7E7E7E74040 1109     717 A31     DC    CL16'XXXXXX      RO R'
    1102 4040404040F040D9          717
    110A C440E7E7E7E7E7E7 111D     718 A32     DC    CL20'D XXXXXXXXXXXXXXXXXX'
    1112 E7E7E7E7E7E7E7E7          718
    111A E7E7E7E7                  718
    111E C8C14040E2C8D3C4 112D     719         DC    CL16'HA  SHLD BE XXXX'
    1126 40C2C540E7E7E7E7          719
    112E E7E7E7E7E7E740D9 113D     720 A33     DC    CL16'XXXXXX RO SHLD B'
    1136 F040E2C8D3C440C2          720
    113E C540E7E7E7E7E7E7 1151     721 A34     DC    CL20'E XXXXXXXXXXXXXXXXXX'
    1146 E7E7E7E7E7E7E7E7          721
    114E E7E7E7E7                  721
    1152 D6C4C460          1155    722 ODD     DC    CL4'ODD-'
    1156 C5E5C5D5          1159    723 EVENM   DC    CL4'EVEN'
    115A D6D240            115C    724 A35     DC    CL3'OK '
    115D C5D9D9            115F    725 A36     DC    CL3'ERR'
    1160 F3E3F4F040C3C540 1182     726 MSG1    DC    CL35'3340 CE PACK INITIALIZATION PROGRAM'
    1168 D7C1C3D240C9D5C9          726
    1170 E3C9C1D3C9E9C1E3          726
    1178 C9D6D540D7D9D6C7          726
    1180 D9C1D4                    726
    1183 C140E2C5D5E2C540 11A5     727         DC    CL35'A SENSE SWITCH MUST BE SET TO INDIC'
    1188 E2E6C9E3C3C840D4          727
    1193 E4E2E340C2C540E2          727
    119B C5E340E3D640C9D5          727
    11A3 C4E9C3                    727
    11A6 C1E3C540E6C8C5D9 11D8     728 MSG2    DC    CL51'ATE WHERE THE DATA MODULE TO BE INITIALIZED RESIDES'
    11AE C540E3C8C640C4C1          728
    11B6 E3C140D4D6C4E4D3          728
    11BE C540E3D640C2C540          728
    11C6 C9D5C9E3C9C1D3C9          728
    11CE E9C5C440D9C5E2C9          728
    11D6 C4C5E2                    728
    11D9 E2C5E340E2E6C9E3 1203     729 MSG3    DC    CL43'SET SWITCH 21 OR 22 TO SELECT DRIVE 1 OR 2.'
    11E1 C3C840F2F140D6D9          729
    11E9 40F2F240E3D640E2          729
    11F1 C5D3C5C3E340C4D9          729
    11F9 C9E5C540F140D6D9          729
    1201 40F24B                    729
    1204 E2C5E340D6D5C540 122E     730 MSG4    DC    CL43'SET ONE SWITCH AND RESET HALT TO CONTINUE  '
    120C E2E6C9E3C3C840C1          730
    1214 D3C440D9C5E2C5E3          730
    121C 40C8C1D3E340E3D6          730
    1224 40C3D6D5E3C9D5E4          730
    122C C54040                    730
    122F C4C1E3C140D4D6C4 1249     731 MSG5A   DC    CL27'DATA MODULE ON 3340 DRIVE X'
    1237 E4D3C540D6D540F3          731
    123F F3F4F040C4D9C9E5          731
    1247 C540E7                    731
    124A 40E6C9D3D340D5D6 1261     732 MSG5    DC    CL24' WILL NOW BE INITIALIZED'
    1252 E640C2C540C9D5C9          732
    125A E3C9C1D3C9E9C5C4          732
    1262 D9C5E2C5E340E3C8 1288     733 MSG6    DC    CL39'RESET THIS HALT TO BEGIN INITIALIZATION'
    126A C9E240C8C1D3E340          733
    1272 E3D640C2C5C7C9D5          733
    127A 40C9D5C9E3C9C1D3          733
    1282 C9E9C1E3C9D6D5            733
    1289 5C5C5C5C5C5C5C5C 12AE     734         DC    CL38'**************************************'
    1291 5C5C5C5C5C5C5C5C          734
    1299 5C5C5C5C5C5C5C5C          734
    12A1 5C5C5C5C5C5C5C5C          734
    12A9 5C5C5C5C5C5C              734
    12AF 5C5C5C5C5C5C5C5C 12D4     735 MSGA    DC    CL38'**************************************'
    12B7 5C5C5C5C5C5C5C5C          735
    12BF 5C5C5C5C5C5C5C5C          735
    12C7 5C5C5C5C5C5C5C5C          735
    12CF 5C5C5C5C5C5C              735
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    12D5 C9D5C9E3C9C1D3C9 12EC     736 TERMSG DC    CL24'INITIALIZATION COMPLETED'
    12DD E9C1E3C9D6D540C3          736
    12E5 D6D4D7D3C5E3C5C4          736
    12ED D5D640E2C5D5E2C5 1317     737 MSG7    DC    CL43'NO SENSE SWITCH WAS SET FOR DRIVE SELECTION'
    12F5 40E2E6C9E3C3C840          737
    12FD E6C1E240E2C5E340          737
    1305 C6D6D940C4D9C9E5          737
    130D C540E2C5D3C5C3E3          737
    1315 C9D6D5                    737
                                   738
                                   739 *           DISK SELECTION SUBROUTINE
                                   740
                                   741 *           CALLING SEQUENCE
                                   742
                                   743 *       B   SELDSK              CALL
                                   744 *       DC  XL1'CO'             DISK TO BE SELECTED (C1,C2,D1 OR D2)
                                   745 *       B   *-*                 RETURN IF DISK IS NOT AVAILABLE
                                   746 *       B   *-*                 RETURN IF SELECTED DISK IS AVAILABLE
                                   747
    1318 34 08 13E2                748 SELDSK  ST    DSKEXT+3,ARR      SAVE RETURN ADDRESS
    131C 3C FF 13EB                749         MVI   SETSW,X'FF'       SET SWITCH
    1320 38 60 020C                750 SELA    TBN   SBYTE4,SSW22+SSW21
    1324 F2 90 30                  751         JF    SELB                CHECK FOR TOO MANY
                                   752 *       TBN   SBYTE4,SSW22+SSW23   SENSE SWITCHES BEING ON
                                   753 *       JT    PINV
                                   754 *       TBN   SBYTE4,SSW22+SSW24
                                   755 *       JT    PINV
                                   756 *       TBN   SBYTE4,SSW21+SSW24
                                   757 *       JT    PINV
                                   758 *       TBN   SBYTE4,SSW21+SSW23
                                   759 *       JT    PINV
                                   760 *       TBN   SBYTE4,SSW21+SSW22
                                   761 *       JT    PINV
                                   762 *       TBN   SBYTE4,SSW23+SSW24
                                   763 *       JF    SELB
    1327 C0 87 021A                764 PINV    B     PRINT               TO PRINT INVALID SSW SETTING
    132B C6              132B      765         DC    XL1'C6'             FLAGS
    132C 1C              132C      766         DC    IL1'28'             LENGTH
    132D 1356            132E      767         DC    AL2(INVLSW)         MESSAGE ADDRESS
    132F C107            1330      768         DC    XL2'C107'           HALT ID
    1331 C0 87 0222                769         B     HALT
    1335 C107            1336      770         DC    XL2'C107'
    1337 C0 87 0A42                771         B     RTN1A               RESTART PROGRAM
                                   772
    133B C9D5E5C1D3C9C440 1356     773 INVLSW  DC    CL28'INVALID SENSE SWITCH SETTING'
    1343 E2C5D5E2C540E2E6          773
    134B C9E3C3C840E2C5E3          773
    1353 E3C9D5C7                  773
                                   774
    1357 35 01 13E2                775 SELB    L     DSKEXT+3,XR1        PUT PARMETER ADDRESS IN XR1
    135B 0E 01 13E2 13E5           776         ALC   DSKEXT+3(2),ONE     STEP EXIT ADDRESS
    1361 3C C0 13EA                777         MVI   MODBIT,X'C0'        INITIALIZE ALL I/O
    1365 3C C6 141D                778         MVI   LCTRL+1,X'C6'       COMMANDS FOR DRIVE 1
    1369 3C C0 146A                779         MVI   TIOERR+1,X'C0'
    136D 3C C4 1421                780         MVI   LDATA+1,X'C4'
    1371 3C C2 144B                781         MVI   TIOBSY+1,X'C2'
    1375 3C C1 1437                782         MVI   TIOSEK+1,X'C1'
    1379 7D C1 00                  783         CLI   0(,XR1),X'C1'
    137C F2 81 5A                  784         JE    SETRUN
                                   785
    137F 7D C2 00                  786         CLI   0(,XR1),X'C2'       TEST FOR SELECT DRIVE 2
    1382 F2 01 1B                  787         JNE   C3                  IF NOT DRIVE 2 GO CHECK FOR DRIVE 3
    1385 3C C8 13EA                788         MVI   MODBIT,X'C8'        INITIALIZE ALL I/O
    1389 3C CE 141D                789         MVI   LCTRL+1,X'CE'       COMMANDS FOR DRIVE 2
    138D 3C C8 146A                790         MVI   TIOERR+1,X'C8'
    1391 3C CC 1421                791         MVI   LDATA+1,X'CC'
    1395 3C CA 1448                792         MVI   TIOBSY+1,X'CA'
    1399 3C C9 1437                793         MVI   TIOSEK+1,X'C9'
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```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT
   139D F2 87 39                794         J      SETRUN
                                795
   13A0 7D D1 00                796 C3      CLI    0(,XR1),X'D1'      TEST FOR SELECT DRIVE 3
   13A3 F2 01 18                797         JNE    C4                 IF NOT 3 IT HAS TO BE 4
   13A6 3C D0 13EA              798         MVI    MODBIT,X'D0'       INITIALIZE ALL I/O
   13AA 3C D6 141D              799         MVI    LCTRL+1,X'D6'       COMMANDS FOR DRIVE 3
   13AE 3C D0 146A              800         MVI    TIOERR+1,X'D0'
   13B2 3C D4 1421              801         MVI    LDATA+1,X'D4'
   13B6 3C D2 1448              802         MVI    TIOBSY+1,X'D2'
   13BA 3C D1 1437              803         MVI    TIOSEK+1,X'D1'
   13BE F2 87 18                804         J      SETRUN
                                805
   13C1 3C D8 13EA              806 C4      MVI    MODBIT,X'D8'       INITIALIZE ALL I/O
   13C5 3C DE 141D              807         MVI    LCTRL+1,X'DE'       COMMANDS FOR DRIVE 4
   13C9 3C D8 146A              808         MVI    TIOERR+1,X'D8'
   13CD 3C DC 1421              809         MVI    LDATA+1,X'DC'
   13D1 3C DA 1448              810         MVI    TIOBSY+1,X'DA'
   13D5 3C D9 1437              811         MVI    TIOSEK+1,X'D9'
   13D9 0E 01 13E2 1625         812 SETRUN  ALC    DSKEXT+3(2),FOUR   STEP EXIT ADDRESS
   13DF C0 87 0000              813 DSKEXT  B      *-*                EXIT
   13E3 000001            13E5  814 ONE     DC     XL3'01'
   13E6 0002              13E7  815 TWO     DC     XL2'02'
   13E8 0003              13E9  816 THREE   DC     XL2'03'
   13EA 00                13EA  817 MODBIT  DC     XL1'0'
   13EB 00                13EB  818 SETSW   DC     XL1'0'
   13EC 8001              13ED  819 XREG    DC     XL2'8001'
   13EE 0003              13EF  820 SVPREG  DC     XL2'0003'
```



```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT
                                822 *              START I/O SUBROUTINE
                                823 *
                                824 *              LINKAGE
                                825 *       B      STRTIO             CALL
                                826 *       DC     XL1'0'             CONTROL CODE,1/2 Q BYTE BITS 4-7
                                827 *       DC     XL1'0'             FUNCTION CODE, R BYTE
                                828 *       DC     AL2(*)             CONTROL FIELD ADDRESS
                                829 *                                 GOOD RETURN
                                830
   13F0 34 08 161C              831 STRTIO  ST     SNSEXT+3,ARR       STORE PARAMETER POINTER.
   13F4 0C 00 1425 13EA         832         MVC    SIO+1(1),MODBIT    SETUP FOR CORRECT DRIVE
   13FA 35 01 161C              833         L      SNSEXT+3,XR1       PUT PARAMETER POINTER IN XR1.
   13FE 18 03 1425 C0           834         MNN    SIO+1,0(,XR1)      TRANSFER 1/2 Q BYTE TO SIO
   1403 1C 00 1426 01           835         MVC    SIO+2(1),1(,XR1)   TRANSFER R BYTE TO SIO
   1408 1C 01 162B 03           836         MVC    DFCR(2),3(,XR1)    TRANSFER CONTROL FIELD ADDRESS
   140D 36 08 1425              837         SBF    SIO+1,X'08'        TURN OFF FILE 2 OR 4 SELECT BIT
   1411 39 08 13EA              838         TBF    MODBIT,X'08'       TEST FOR RUN ON FILE 1 OR 3
   1415 F2 10 04                839         JT     *+7                JUMP IF YES
   1418 34 08 1425              840         SBN    SIO+1,X'08'        IF NO, SET ON FILE 2 OR 4 BIT
   141C 31 C6 162B              841 LCTRL   LIO    DFCR,X'C6'         LOAD CONTROL FIELD ADDRESS.
   1420 31 C4 1629              842 LDATA   LIO    DFDR,X'C4'         LOAD DATA FIELD ADDRESS
   1424 F3 C0 00                843 SIO     SIO    0,X'C0'            START I/O
   1427 D0 87 04                844         B      4(,XR1)            NORMAL EXIT
                                845
                                845
                                846 *              SUBROUTINE TO TEST FOR SEEK BUSY
                                847 *
                                848 *              CALLING SEQUENCE
                                849 *
                                850 *       B      SEKBSY             CALL
                                851 *       B      NOTBSY             RETURN FOR NOT BUSY
                                852 *                                 RETURN FOR BUSY
                                853
                                853
   142A 34 08 143D              854 SEKBSY  ST     TIOEXT+3,ARR       SET RETURN ADDRESS FOR NOT BUSY
   142E 36 08 1625              855         A      FOUR,ARR
   1432 34 08 1439              856         ST     TIOSEK+3,ARR       SET RETURN ADDRESS FOR BUSY
   1436 C1 C1 0000              857 TIOSEK  TIO    *-*,X'C1'          TEST FOR SEEK BUSY
   143A C0 87 0000              858 TIOEXT  B      *-*                RETURN FOR NOT BUSY
                                859
                                860 *              22 MACHINE CYCLES FOR EACH PASS ON BUSY = 33.44 MICROSEC.
                                861
                                861
                                862 *              SUBROUTINE TO TEST FOR ATTACHMENT BUSY
                                863 *
                                864 *              CALLING SEQUENCE
                                865 *
                                866 *       B      ATHBSY             ROUTINE CALL
                                867 *       B      NOTBSY             RETURN FOR NOT BUSY
                                868 *                                 RETURN FOR BUSY
                                869
   143E 34 08 1451              870 ATHBSY  ST     ATHEXT+3,ARR       SAVE RETURN ADDRESS FOR NOT BUSY
   1442 36 08 1625              871         A      FOUR,ARR
   1446 34 08 144D              872         ST     TIOBSY+3,ARR       SET RETURN ADDRESS FOR BUSY
   144A C1 C2 0000              873 TIOBSY  TIO    *-*,X'C2'          TEST FOR ATTACHMENT BUSY
   144E C0 87 0000              874 ATHEXT  B      *-*                RETURN FOR NOT BUSY
                                875
                                876 *              SUBROUTINE TO TEST FOR DEVICE ERROR OR NOT READY
                                877 *
                                878 *              CALLING SEQUENCE
                                879
                                880 *       B      DEVERR             ROUTINE CALL
                                881 *       B      ERROR              RETURN FOR ERROR OR NOT READY
                                882 *       B      GOOD               RETURN FOR READY
                                883
   1452 34 08 1464              884 DEVERR  ST     ERROR+3,ARR        SAVE RETURN ADDRESS
   1456 36 08 1625              885         A      FOUR,ARR
   145A 34 08 1468              886         ST     DEVEXT+3,ARR       STORE READY ADDRESS
```

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   145E F2 87 08              887          J     TIOERR              GO CHECK FOR AN ERROR
   1461 C0 87 0000            888 TERROR   B     *-*                 RETURN WITH AN ERROR INDICATION
   1465 C0 87 0000            889 DEVEXT   B     *-*                 RETURN FOR READY
                              890
                              891 *
                              892 *       THIS WILL CHECK FOR AN ERROR AND IF THERE IS ONE,
                              893 *       SAVE THE 24 BYTES OF DIAGNOSTIC SENSE INFORMATION.
                              894 *
   1469 C1 C0 1471            895 TIOERR   TIO   RDDIAG,X'C0'           NOT READY/ERROR?
   146D C0 87 1465            896          B     DEVEXT                 NO-MAKE GOOD RETURN
                              897 *
                              898 *       ON ERROR INDICATIONS RETURN HERE
                              899 *
                     1471     900 RDDIAG   EQU   *
   1471 C0 87 15F2            901          B     SENSE                  SAVE STATUS
   1475 05                    902          DC    XL1'05'
   1476 38 01 1627            903          TBN   STATUS,X'01'           ADAPTER CHECK?
   147A F2 90 1B              904          JF    NADAP
   147D C0 87 021A            905          B     PRINT                  PRINT
   1481 C2                    906          DC    XL1'C2'                ADAPTER
   1482 0D                    907          DC    IL1'13'                CHECK
   1483 1544                  908          DC    AL2(MSGADP)
   1485 C108                  909          DC    XL2'C108'
   1487 C0 87 1698            910          B     PRTSNS                 PRINT STATUS
   148B 85                    911          DC    XL1'85'
   148C 0000                  912          DC    XL2'00'
   148E C0 87 0222            913          B     HALT
   1492 C108                  914          DC    XL2'C108'
   1494 C0 87 148E            915          B     *-6
                              916
   1498 39 F0 1626            917 NADAP    TBF   STATUS-1,X'F0'         ANY UNIT CHECK?
   149C F2 10 0A              918          JT    NUNCK
   149F C0 87 1698            919          B     PRTSNS                 INDICATE STATUS ERRORS
   14A3 85                    920          DC    XL1'85'
   14A4 0000                  921          DC    XL2'00'
   14A6 F2 87 11              922          J     RDIAG                  GO INDICATE READ DIAG INFO
                              923
   14A9 C0 87 1698            924 NUNCK    B     PRTSNS                 JUST PRINT STATUS
   14AD 85                    925          DC    XL1'85'                 FOR ANY OTHER ERROR
   14AE 0000                  926          DC    XL2'00'
   14B0 C0 87 0222            927          B     HALT
   14B4 C10A                  928          DC    XL2'C10A'
   14B6 C0 87 14B0            929          B     *-6
                              930
                              931 *
   14BA 0C 01 1629 1537       932 RDIAG    MVC   DFDR(2),ADIAG          SETUP FOR DATA FIELD
   14C0 C0 87 13F0            933          B     STRTIO                 ISSUE
   14C4 01                    934          DC    XL1'01'                READ
   14C5 07                    935          DC    XL1'07'                DIAG SENSE
   14C6 1636                  936          DC    AL2(RDFCF)             (NOT REALLY USED)
   14C8 C0 87 1075            937          B     ATTBSY
   14CC C0 87 14D0            938          B     *+4
                              939
   14D0 34 01 1515            940          ST    SAVXR1+3,XR1           SAVE XR1
   14D4 34 02 1519            941          ST    SAVXR2+3,XR2           SAVE XR2
   14D8 C2 01 151D            942          LA    DIAG-1,XR1             XR1 POINTS TO THE DIAG SNS INFO
   14DC C2 02 1583            943          LA    MSGSNS-35,XR2          XR2 POINTS TO THE UNPACKED DATA
                              944
   14E0 D2 01 02              945 REPET    LA    2(,XR1),XR1
   14E3 E2 02 05              946          LA    5(,XR2),XR2
   14E6 34 01 14F4            947          ST    FROM1,XR1
   14EA 34 02 14F6            948          ST    TO,XR2
   14EE C0 87 021E            949          B     UNPACK                 UNPACK 2 BYTES AT A TIME
   14F2 02                    950          DC    XL1'02'
   14F3 0000                  951 FROM1    DC    AL2(*-*)
   14F5 0000                  952 TO       DC    AL2(*-*)
   14F7 BD FF 01              953          CLI   1(,XR2),X'FF'          FINISHED?
   14FA C0 01 14E0            954          BNE   REPET
```



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ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   14FE C0 87 021A            955          B     PRINT                  PRINT INFO WHEN DONE
   1502 C6                    956          DC    XL1'C6'
   1503 46                    957          DC    IL1'70'
   1504 15BF                  958          DC    AL2(MSGSN1)
   1506 C109                  959          DC    XL2'C109'
   1508 C0 87 0222            960          B     HALT
   150C C109                  961          DC    XL2'C109'
   150E C0 87 1508            962          B     *-6
                              963
   1512 C2 01 0000            964 SAVXR1   LA    *-*,XR1                RESTORE XR1
   1516 C2 02 0000            965 SAVXR2   LA    *-*,XR2                RESTORE XR2
   151A C0 87 1461            966          B     TERROR                 GIVE ERROR RETURN
                              967
                     151E     968 DIAG     EQU   *                      DESTINATION FIELD FOR 24 BYTES OF
   151E 0000000000000000 1535 969          DC    24XL1'00'               DIAGNOSTIC SENSE INFORMATION
   1526 0000000000000000      969
   152E 0000000000000000      969
   1536 151E                  970 ADIAG    DC    AL2(DIAG)
                              971
   1538 C1C4C1D7E3C5D940 1544 972 MSGADP   DC    CL13'ADAPTER CHECK'
   1540 C3C8C5C3D2            972
   1545 C3E8D340F06B40C8 1576 973          DC    CL50'CYL 0, HD 0 IS DEFECTIVE-DATA MODULE MUST BE REPAI'
   154D C440F040C9E240C4      973
   1555 C5C6C5C3E3C9E5C5      973
   155D 60C4C1E3C140D4D6      973
   1565 C4E4D3C540D4E4E2      973
   156D E340C2C540D9C5D7      973
   1575 C1C9                  973
   1577 D9C5C4           1579 974 MSG00   DC    CL03'RED'
   157A C4C9C1C740E2C5D5 15A6 975 MSGSNS   DC    CL45'DIAG SENSE-XXXX XXXX XXXX XXXX XXXX XXXX XXXX'
   1582 E2C560E7E7E7E740       975
   158A E7E7E7E740E7E7E7      975
   1592 E740E7E7E7E740E7      975
   159A E7E7E740E7E7E7E7      975
   15A2 40E7E7E7E7            975
   15A7 40E7E7E7E740E7E7 15BF 976 MSGSN1   DC    CL25' XXXX XXXX XXXX XXXX XXXX'
   15AF E7E740E7E7E7E740      976
   15B7 E7E7E7E740E7E7E7      976
   15BF E7                    976
   15C0 FF               15C0 977          DC    XL1'FF'                END OF PRINT LINE
   15C1 C3C3C3C3C8C8C8C8 15C8 978 MSGBAD   DC    CL8'CCCCHHHH'
   15C9 40C9E240C4C5C6C5 15D8 979          DC    CL16' IS DEFECTIVE...'
   15D1 C3E3C9E5C54B4B4B      979
   15D9 C3C3C3C3C8C8C8C8 15E0 980 MSGOOD   DC    CL8'CCCCHHHH'
   15E1 40C9E240E3C8C540 15F1 981 MSGASN   DC    CL17' IS THE ALTERNATE'
   15E9 C1D3E3C5D9D5C1E3      981
   15F1 C5                    981
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                          983 *              SENSE SUBROUTINE
                          984 *
                          985 *              LINKAGE
                          986 *
                          987 *        B     SENSE                CALL
                          988 *        DC    XL1'0'               1/2 N BYTE, BITS 4-7
                          989 *
   15F2 34 08 1609        990 SENSE    ST    SNSMOV+5,ARR         STORE PARAMETER POINTER
   15F6 36 08 13E5        991          A     ONE,ARR              SET RETURN ADDRESS
   15FA 34 08 161C        992          ST    SNSEXT+3,ARR         STORE RETURN ADDRESS
   15FE D2 00 1616 13EA   993          MVC   SNS+1(1),MODBIT      SETUP FOR SENSE COMMAND TO DRIVE X
   1604 08 03 1616 0000   994 SNSMOV   MNN   SNS+1,*-*            TRANSFER 1/2 Q BYTE TO SENSE OP.
   160A 38 08 13EA        995          TBN   MODBIT,X'08'         DRIVE 2 OR 4?
   160E F2 90 04          996          JF    *+7
   1611 3A 08 1616        997          SBN   SNS+1,X'08'          SET FOR 2 OR 4
   1615 30 C0 1627        998 SNS      SNS   STATUS,X'C0'         SENSE OP
   1619 C0 87 0000        999 SNSEXT   B     *-*                  EXIT
                         1000
   161D 010001002F       1621 1001 RKDN    DC    XL5'010001002F'      R1,K=0,D=256,N=47
   1622 FFFF             1623 1002 NEG1    DC    XL2'FFFF'
   1624 0004             1625 1003 FOUR    DC    XL2'04'
   1626 0000             1627 1004 STATUS  DC    XL2'0'               SENSE AREA
   1628 3000             1629 1005 DFDR    DC    AL2(BUFFER)          DATA AREA ADDRESS
   162A 0000             1628 1006 DFCR    DC    AL2(*-*)             CONTROL FIELD ADDRESS
   162C 00               162C 1007 WDFCF   DC    XL1'0'               FLAG
   162D 0000             162E 1008         DC    XL2'0'               CYLINDER        0000 - 00CB
   162F 0000             1630 1009         DC    XL2'0'               HEAD            0000 - 0013
   1631 00               1631 1010         DC    XL1'0'               RECORD NUMBER     00 - FF
   1632 00               1632 1011         DC    XL1'0'               KEY LENGTH        00 - FF
   1633 0000             1634 1012         DC    XL2'0'               DATA LENGTH     000C - 00FF
   1635 00               1635 1013         DC    XL1'0'               NUMBER OF RECORDS, 00-FF
                         1014 *                                   NOTE. KEY LENGTH + DATA LENGTH MUST NOT
                         1015 *                                         BE GREATER THAN 00FF
                         1636 1016 RDFCF   EQU   *
   1636 00000000000000000 163F 1017         DC    XL10'0'              READ HOME ADDRESS AREA
   163E 0000             1017
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         1019 *              THIS SUBROUTINE WILL CONVERT ONE BYTE OF
                         1020 *              HEX DATA TO ONE BYTE OF HEXADECEMAL DATA
                         1021
   1640 36 08 13E5       1022 CVD     A     ONE,ARR              ADD 1 TO GET 1ST PARAMETER
   1644 34 08 1661       1023         ST    FROM+5,ARR           INSERT THE FROM ADDRESS
   1648 36 08 13E7       1024         A     TWO,ARR              ADD 2 TO GET THE 2ND PARAMETER
   164C 34 08 1667       1025         ST    TYBOT+5,ARR          INSERT THE TO ADDR.
   1650 34 08 166D       1026         ST    OTORZ+5,ARR
   1654 36 08 13E5       1027         A     ONE,ARR              ADD 1 TO GET RETURN ADDRESS
   1658 34 08 1690       1028         ST    TIXE+3,ARR
   165C D2 01 1673 0000  1029 FROM    MVC   FROBYT+5(2),*-*
   1662 D2 01 1686 0000  1030 TYBOT   MVC   TOBYT+3(2),*-*
   1668 D2 01 1677 0000  1031 OTORZ   MVC   ZROTO+3(2),*-*
   166E D2 00 1691 0000  1032 FROBYT  MVC   HXBYT(1),*-*       PUT BYTE IN WORK AREA
   1674 04 20 0000 1692  1033 ZROTO   ZAZ   *-*(3),UNITS(1)   ZERO THE TO AREA
   167A 0F 00 1691 13E5  1034 DECGAN  SLC   HXBYT(1),ONE      DECREMENT THE HEX BYTE
   1680 F2 82 0A         1035         JL    TIXE               EXIT IF BELOW 1
   1683 D6 10 0000 1697  1036 TOBYT   AZ    *-*(2),DECONE(1)   INCREMENT THE DECEMAL COUNT
   1689 C0 87 167A       1037         B     DECGAN
   168D C0 87 0000       1038 TIXE    B     *-*                EXIT
                         1039
   1691 00               1691 1040 HXBYT   DC    XL1'0'
   1692 F0               1692 1041 UNITS   DC    CL1'0'
   1693 F0F0F0F0F1       1697 1042 DECONE  DC    CL5'00001'
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          1044 *            SENSE DECODE SUBROUTINE
                          1045 *
                          1046 *      LINKAGE
                          1047 *
                          1048 *      B     PRTSNS          CALL
                          1049 *      DC    XL1'0'          2 BYTES TO SENSE & TEST
                          1050 *      DC    XL2'0'          EXPECTED SENSE BITS
                          1051
  1698 34 08 17A2         1052 PRTSNS ST    SENEXT+3,ARR    SAVE RETURN ADDRESS
  169C 35 01 17A2         1053        L     SENEXT+3,XR1    SET XR2 AS A PARMETER POINTER
  16A0 1C 00 16B5 00      1054        MVC   SNSPRM(1),0(,XR1) MOVE BYTE NO. TO USE
  16A5 1C 01 17A8 02      1055        MVC   EXPSNS(2),2(,XR1) MOVE EXPECTED SENSE BIT MASK.
                          1056
  16AA C2 02 16B5         1057        LA    SNSPRM,XR2      LOAD XR2 AS POINTER TO SENSE PARM.
  16AE BB 80 00           1058        SBF   0(,XR2),X'80'   TURN OFF HEADING BIT IF ON
  16B1 C0 87 15F2         1059        B     SENSE           TO SENSE SUBROUTINE
  16B5 00                 1685 1060 SNSPRM DC   XL1'0'
  16B6 78 80 00           1061        TBN   0(,XR1),X'80'   TEST FOR HEADING PRINT
  16B9 F2 90 08           1062        JF    FIRST           JUMP IF NO
  16BC C0 87 021A         1063        B     PRINT           TO PRINT HEADING
  16C0 02                 16C0 1064   DC    XL1'02'         FLAG
  16C1 36                 16C1 1065   DC    IL1'54'         LENGTH
  16C2 182A               16C3 1066   DC    AL2(SNSHED)     MESSAGE ADDRESS
                          1067
  16C4 C2 01 182B         1068 FIRST  LA    SNSWDO,XR1      POINT XR1 TO 1ST MESSAGE
  16C8 BD 05 00           1069        CLI   0(,XR2),X'05'   TEST FOR CORRECT DECODE
  16CB F2 81 03           1070        JE    SETDRV          JUMP IF YES
  16CE F0 00 00           1071        HPL   0,0
                          16D1 1072 SETDRV EQU  *
  16D1 3B 86 1627         1073        SBF   STATUS,X'86'    RESET UNUSED BITS(0,5,6)
  16D5 CC 01 172A 17A4    1074 SETSNS MVC   TSTRCV+3(2),RCVDAD SET ADDRESS FOR RECEIVED.
  16DB 0C 01 173A 17A6    1075        MVC   TSTEXP+3(2),EXPSAD SET ADDRESS FOR EXPECTED.
  16E1 C2 02 17A9         1076 SETMSK LA    TSTMSK,XR2      SET XR2 AS TEST POINTER.
  16E5 2C 00 1728 00      1077        MVC   TSTRCV+1(1),0(,XR2) SET MASK FOR RECEIVED TEST
  16EA 2C 00 1738 00      1078        MVC   TSTEXP+1(1),0(,XR2) SET MASK FOR EXPECTED TEST
  16EF 3C 40 17E6         1079        MVI   RCVMSG,C' '     BLANK
  16F3 0C 34 17E5 17E6    1080        MVC   RCVMSG-1(53),RCVMSG PRINT AREA
  16F9 3C 00 17ED         1081        MVI   REMEXP,0        RESET
  16FD 3C 00 17EE         1082        MVI   REMRCV,0        REMEMBER BITS
  1701 7D 00 00           1083        CLI   0(,XR1),0       TEST FOR ZERO ENTRY
  1704 F2 81 63           1084        JE    STEP+3          JUMP IF YES
  1707 1C 00 172F 00      1085        MVC   RCVMVC+1(1),0(,XR1) SET MESSAGE LENGTH
  170C 1C 00 173F 00      1086        MVC   EXPMVC+1(1),0(,XR1) SET MESSAGE LENGTH
  1711 1C 00 1742 00      1087        MVC   EXPMVC+4(1),0(,XR1) SET MESSAGE OFFSET
  1716 0E 00 1742 13E5    1088        ALC   EXPMVC+4(1),ONE   INCREASE OFFSET BY 1
  171C 0C 00 1732 1742    1089        MVC   RCVMVC+4(1),EXPMVC+4 SET MESSAGE OFFSET
  1722 1C 00 1769 00      1090        MVC   STEP+2(1),0(,XR1) SET INCREMENT VALUE
  1727 38 00 0000         1091 TSTRCV TBN   *-*,*-*         TEST A RECEIVED SENSE BIT
  172B F2 90 09           1092        JF    TSTEXP          JUMP IF OFF
  172E 1C 18 17E6 00      1093 RCVMVC MVC   RCVMSG(25),0(,XR1) PUT MESSAGE IN RCVD, AREA
  1733 3C FF 17EE         1094        MVI   REMRCV,X'FF'    SET REMEMBER RECVD.
  1737 38 00 0000         1095 TSTEXP TBN   *-*,*-*         TEST AN EXPECTED SENSE BIT
  173B F2 90 09           1096        JF    *+12            JUMP IF OFF
  173E 1C 18 17CD 00      1097 EXPMVC MVC   EXPMSG(25),0(,XR1) PUT MESSAGE IN EXPECTED AREA.
  1743 3C FF 17ED         1098        MVI   REMEXP,X'FF'    SET REMEMBER EXPECTED.
  1747 0D 00 17ED 17EE    1099        CLC   REMEXP(1),REMRCV COMPARE RCV'D & EXPECTED
  174D F2 81 06           1100        JE    *+9             JUMP IF EQUAL
  1750 0C 01 17B3 17E8    1101        MVC   ERMAG-1(2),TWOASK NOT EQUAL SO INSERT **
  1756 0D 01 17EE 17F2    1102        CLC   REMRCV(2),ZERO  TEST FOR NEITHER ON
  175C F2 81 08           1103        JE    STEP            JUMP IF SO
                          1104
  175F C0 87 021A         1105        B     PRINT           TO PRINT ONE LINE
  1763 01                 1763 1106   DC    XL1'01'         FLAGS
  1764 36                 1764 1107   DC    IL1'54'         LENGTH
  1765 17E6               1766 1108   DC    AL2(RCVMSG)     MESSAGE ADDRESS
  1767 D2 01 19           1109 STEP   LA    2(,XR1),XR1     STEP MESSAGE POINTER
  176A D2 01 02           1110        LA    2(,XR1),XR1     INCREASE POINTER BY 2
  176D 3D 01 1728         1111        CLI   TSTRCV+1,01     TEST FOR COMPLETION OF A BYTE
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  1771 F2 81 07           1112        JE    *+10            JUMP IF FINISHED WITH ONE BYTE.
  1774 E2 02 01           1113        LA    1(,XR2),XR2     NOT FINISHED, STEP MASK POINTER
  1777 C0 87 16E5         1114        B     SETMSK+4        TEST THE NEXT BIT
  177B 0D 01 172A 17A4    1115        CLC   TSTRCV+3(2),RCVDAD TEST FOR BOTH BYTES TESTED
  1781 F2 01 10           1116        JNE   LASTSP          JUMP TO EXIT ROUTINE IF YES.
  1784 0E 01 172A 13E5    1117        ALC   TSTRCV+3(2),ONE INCREMENT RECEIVED ADDRESS
  178A 0E 01 173A 13E5    1118        ALC   TSTEXP+3(2),ONE INCREMENT EXPECTED ADDRESS
  1790 C0 87 16E1         1119        B     SETMSK          TEST NEXT BYTE
                          1120
  1794 C0 87 021A         1121 LASTSP B     PRINT           TO SPACE ONLY
  1798 16                 1798 1122        DC    XL1'16'
  1799 0E 01 17A2 13E9    1123        ALC   SENEXT+3(2),THREE STEP EXIT ADDRESS
  179F C0 87 0000         1124 SENEXT B     *-*             EXIT
                          1125
  17A3 1626               17A4 1126 RCVDAD DC   AL2(STATUS-1)
  17A5 17A7               17A6 1127 EXPSAD DC   AL2(EXPSNS-1)
  17A7 0000               17A8 1128 EXPSNS DC   XL2'0'
                          17A9 1129 TSTMSK EQU  *
  17A9 80402010           17AC 1130        DC   XL4'80402010'
  17AD 08040201           17B0 1131        DC   XL4'08040201'
  17B1 00000000           17B4 1132 ERMAG  DC   XL4'0'
  17B5 4040404040404040 17CD 1133 EXPMSG DC   CL25'
  17BD 4040404040404040
  17C5 4040404040404040
  17CD 40                 1133
  17CE 4040404040404040 17E6 1134 RCVMSG DC   CL25'
  17D6 4040404040404040
  17DE 4040404040404040
  17E6 40                 1134
  17E7 5C5C               17E8 1135 TWOASK DC   CL2'**'
  17E9 0000               17EA 1136 SEKFLG DC   XL2'00'
  17EB 3000               17EC 1137 ABUF   DC   AL2(BUFFER)
  17ED 00                 17ED 1138 REMEXP DC   XL1'0'
  17EE 00                 17EE 1139 REMRCV DC   XL1'0'
  17EF 0000               17F0 1140        DC   XL2'00'          REQUIRED TO MAKE ZERO 4 BYTES
  17F1 0000               17F2 1141 ZERO   DC   XL2'0'
  17F3 FFFF               17F4 1142 MINONE DC   IL2'-1'
  17F5 C5D9D94040404040 181C 1143        DC   CL40'ERR      EXPECTED SENSE              RECEI'
  17FD 40C5E7D7C5C3E3C5
  1805 C440E2C5D5E2C540
  180D 4040404040404040
  1815 40404040D9C5C3C5C9
  181D E5C5C440E2C5D5E2 182A 1144 SNSHED DC   CL14'VED SENSE     '
  1825 C54040404040
  1828 12                 1828 1145 SNSWDO DC   IL1'18'
  182C E4D5C9E340C3C8C5 183E 1146        DC   CL19'UNIT CHECK, DRIVE 1'
  1834 C3D26840C4D9C9E5
  183C C540F1
  183F 12                 183F 1147        DC   IL1'18'
  1840 E4D5C9E340C3C8C5 1852 1148        DC   CL19'UNIT CHECK, DRIVE 2'
  1848 C3D26840C4D9C9E5
  1850 C540F2
  1853 12                 1853 1149        DC   IL1'18'
  1854 E4D5C9E340C3C8C5 1866 1150        DC   CL19'UNIT CHECK, DRIVE 3'
  185C C3D26840C4D9C9E5
  1864 C540F3
  1867 12                 1867 1151        DC   IL1'18'
  1868 E4D5C9E340C3C8C5 187A 1152        DC   CL19'UNIT CHECK, DRIVE 4'
  1870 C3D26840C4D9C9E5
  1878 C540F4
  1878 15                 187B 1153        DC   IL1'21'
  187C E2C5C5D240C3D6D4 1891 1154        DC   CL22'SEEK COMPLETE, DRIVE 1'
  1884 D7D3C5E3C56840C4
  188C D9C9E5C540F1
  1892 15                 1892 1155        DC   IL1'21'
  1893 E2C5C5D240C3D6D4 18A8 1156        DC   CL22'SEEK COMPLETE, DRIVE 2'
  189B D7D3C5E3C56840C4 1156
  18A3 D9C9E5C540F2       1156
```

DD90 3340 DATA MODULE INITIALIZER-- MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
    18A9 15              18A9 1157        DC    IL1'21'
    18AA E2C5C5D240C3D6D4 18BF 1158       DC    CL22'SEEK COMPLETE, DRIVE 3'
    18B2 D7D3C5E3C56B40C4       1158
    18BA D9C9E5C540F3           1158
    18C0 15              18C0 1159        DC    IL1'21'
    18C1 E2C5C5D240C3D6D4 18D6 1160       DC    CL22'SEEK COMPLETE, DRIVE 4'
    18C9 D7D3C5E3C56B40C4       1160
    18D1 D9C9E5C540F4           1160
                                1161
    18D7 0000            18D8 1162        DC    XL2'00'
    18D9 09              18D9 1163        DC    IL1'09'
    18DA E2C3C1D540C5D8E4 18E3 1164       DC    CL10'SCAN EQUAL'
    18E2 C1D3                   1164
    18E4 15              18E4 1165        DC    IL1'21'
    18E5 D7D9D6C7D9C1D440 18FA 1166       DC    CL22'PROGRAM LOAD-REMOVABLE'
    18ED D3D6C1C460D9C5D4       1166
    18F5 D6E5C1C2D3C5           1166
    18F8 05              18FB 1167        DC    IL1'05'
    18FC D6D740C5D5C4    1901 1168        DC    CL06'OP END'
    1902 04              1902 1169        DC    IL1'04'
    1903 D5D640D6D7      1907 1170        DC    CL05'NO OP'
    1908 0000            1909 1171        DC    XL2'00'
    190A 0000            190B 1172        DC    XL2'00'
    190C 0C              190C 1173        DC    IL1'12'
    190D C1C4C1D7E3C5D940 1919 1174       DC    CL13'ADAPTER CHECK'
    1915 C3C8C5C3D2             1174
```


DD90 3340 DATA MODULE INITIALIZER-- MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                         191A 1176 WORK   EQU   *
                              1177
                         0008 1178 ARR    EQU   X'08'
                         0001 1179 XR1    EQU   X'01'
                         0002 1180 XR2    EQU   X'02'
                         020A 1181 SECTSW EQU   X'20A'
                         020A 1182 SBYTE2 EQU   X'020A'
                         020B 1183 SBYTE3 EQU   X'020B'
                         020C 1184 SBYTE4 EQU   X'020C'
                         020D 1185 SBYTE5 EQU   X'020D'
                         0080 1186 SSW10  EQU   X'80'
                         0040 1187 SSW11  EQU   X'40'
                         0020 1188 SSW12  EQU   X'20'
                         0010 1189 SSW13  EQU   X'10'
                         0008 1190 SSW14  EQU   X'08'
                         0004 1191 SSW15  EQU   X'04'
                         0002 1192 SSW16  EQU   X'02'
                         0001 1193 SSW17  EQU   X'01'
                         0040 1194 SSW21  EQU   X'40'    SELECTS DRIVE 1
                         0020 1195 SSW22  EQU   X'20'    SELECTS DRIVE 2
                         0010 1196 SSW23  EQU   X'10'    SELECTS DRIVE 3
                         0008 1197 SSW24  EQU   X'08'    SELECTS DRIVE 4
                         0216 1198 LINK   EQU   X'216'
                         022A 1199 LOAD   EQU   X'22A'
                         0200 1200 SMOD   EQU   X'200'
                         0222 1201 HALT   EQU   X'222'
                         021A 1202 PRINT  EQU   X'21A'
                         0232 1203 UTAB   EQU   X'232'
                         021E 1204 UNPACK EQU   X'21E'
                              1205 *
                              1206 *
                              1207 *     WRITE BUFFER     **********************
                              1208 *
                              1209 *
                              1210       ORG   X'3000'
                         3000 1211 BUFFER EQU   *
                         5FFF 1212        DS    48CL256
                         6000 1213 EBUF   EQU   *
                         0000 1214        END   DD9
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ABUF	A	002	17EC	1137	0275 0322 0421 0466 0510
ADIAG	A	002	1537	0970	0932
ALTADR	A	002	101A	0651	0398 0449
ALTCYL	A	002	0FFB	0636	0196
ALTDCF	A	001	1000	0640	0382* 0389 0397* 0408 0419* 0420* 0425 0453 0522
ALTFLG	A	001	0FE6	0618	0383* 0415 0416* 0459*
ALTHA	A	001	1018	0652	0402 0405 0408
ALTODD	A	001	0F70	0584	0417
ALTROC	A	014	1017	0649	0395* 0396 0396* 0467* 0471 0476* 0480 0651
ARR	C	001	0008	1178	0596 0658 0681 0748 0831 0854 0855* 0856 0870 0871* 0872 0884 0885* 0886 0990 0991* 0992 1022* 1023 1024* 1025 1026 1027* 1028 1052
ASSIGN	A	001	0D13	0367	0270 0273 0295
ATHBSY	A	004	143E	0870	0683
ATHEXT	A	004	144E	0874	0870*
ATTBSY	A	004	1075	0681	0240 0280 0288 0328 0341 0404 0426 0435 0445 0454 0472 0481 0504 0515 0528 0538 0547 0687 0937
A08	A	001	10D4	0711	0260 0294 0706
A19	A	004	10D9	0713	
A27	A	014	10E9	0715	0227* 0228 0228* 0250 0294 0519* 0520* 0521* 0522* 0523* 0527 0537 0565 0705
A29	A	016	10F9	0716	0263* 0266*
A31	A	016	1109	0717	0246
A32	A	020	1110	0718	0251 0303
A33	A	016	113D	0720	0256
A34	A	020	1151	0721	0261
A35	A	003	115C	0724	
A36	A	003	115F	0725	
BUFFER	A	061	3000	1211	0039 1005 1137
CKCYL	A	005	0D82	0408	0406
CKFLG	A	004	0D93	0413	0409
CKRO	A	006	0C74	0294	0268
CKSW12	A	004	0C7E	0296	
CKTYPE	A	001	0C98	0307	0313
CK14	A	004	0C91	0305	0298
CLEAR	A	003	0A1C	0040	0044
CREAD	A	001	0E8D	0502	0552* 0573*
CREAD1	A	001	0F10	0545	0555* 0576*
CVD	A	004	1640	1022	
CWRITE	A	001	0EB1	0513	0553* 0574*
CWRIT1	A	001	0EDB	0526	0532 0554* 0575*
C3	A	003	13A0	0796	0787
C4	A	004	13C1	0806	0797
DD9	A	001	0000	0005	1214
DECGAN	A	006	167A	1034	1037
DECONE	A	005	1697	1042	1036
DEVERR	A	004	1452	0884	0144 0174 0223 0281 0289 0329 0342 0392 0427 0436 0446 0473 0482 0496 0505 0516 0529 0539 0548
DEVEXT	A	004	1465	0889	0886* 0896
DFLR	A	002	1628	1006	0836* 0841
DFDR	A	002	1629	1005	0234* 0275* 0322* 0398* 0421* 0449* 0466* 0499* 0510* 0542* 0842 0932*
DIAG	A	001	151E	0968	0942 0970
DISK	A	004	0ADD	0129	0123
DONE	A	001	0A32	0046	0037
DOODD	A	004	0F58	0573	0557
DOREAD	A	004	0D58	0395	0464 0590
DSKEXT	A	004	13DF	0813	0748* 0775 0776* 0812*
EATT	A	004	10BF	0700	0681* 0684
EBSY	A	004	1071	0677	0658* 0661
EBUF	A	001	6000	1213	
EINC	A	004	0FC6	0614	0596* 0602 0605
ERMAG	A	004	17B4	1132	1101*
ERR	A	004	0D88	0410	0407
ERRCTR	A	001	10C4	0702	0129* 0296*
ER6225	A	025	0B57	0172	0165
ER6255	A	026	1070	0676	0669

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ER6275	A	024	10BE	0698	0691
EVEN	A	006	0E30	0466	0458
EVENM	A	004	1159	0723	0263
EXPMSG	A	025	17CD	1133	1097*
EXPMVC	A	005	173E	1097	1086* 1087* 1088* 1089
EXPSAD	A	002	17A6	1127	1075
EXPSNS	A	002	17A8	1128	1055* 1127
FAA	A	002	0FED	0626	0047
FINI	A	001	0B9D	0201	0193
FIRST	A	004	16C4	1068	1062
FLAG2	A	001	0FE7	0619	0551 0556* 0577*
FOUR	A	002	1625	1003	0812 0855 0871 0885
FROBYT	A	006	166E	1032	1029*
FROM	A	006	165C	1026	1023*
FROM1	A	002	14F4	0951	0947*
HALT	C	001	0222	1201	0068 0078 0119 0168 0377 0611 0672 0694 0769 0913 0927 0960
HXBYT	A	001	1691	1040	1032* 1034*
ICYL	A	004	0B79	0192	0184
IHDCYL	A	004	0B68	0183	0352 0571
INCALT	A	004	0F88	0596	0410 0484
INCYL	A	006	0FA5	0603	0600
INVLSW	A	028	1356	0773	0767
JMP	A	003	0A11	0037	0045*
LAA	A	002	0FF7	0634	0597
LASTSP	A	004	1794	1121	1116
LCTRL	A	004	141C	0841	0778* 0789* 0799* 0807*
LDATA	A	004	1420	0842	0780* 0791* 0801* 0809*
LINK	C	001	0216	1198	
LOAD	C	001	022A	1199	0206
MAKPRT	A	004	0AB2	0108	0106
MINONE	A	002	17F4	1142	0043
MODBIT	A	001	13EA	0817	0777* 0788* 0798* 0806* 0832 0838 0993 0995
MSGA	A	038	1204	0735	
MSGADP	A	013	1544	0972	0908
MSGALT	A	028	0FE5	0617	0609
MSGASN	A	017	15F1	0981	0570
MSGBAD	A	008	15C8	0978	0562
MSGOOD	A	008	15E0	0980	0566
MSGSNS	A	045	15A6	0975	0943
MSGSN1	A	025	15BF	0976	0958
MSGOO	A	003	1579	0974	0375
MSG1	A	035	1182	0726	0052
MSG2	A	051	1108	0728	0058
MSG3	A	043	1203	0729	0062
MSG4	A	043	122E	0730	0066
MSG5	A	024	1261	0732	0113
MSG5A	A	027	1249	0731	0104* 0105 0107* 0108*
MSG6	A	039	1288	0733	0118
MSG7	A	043	1317	0737	0076
NAA	A	002	0FF2	0630	0047* 0382 0597 0599 0601* 0603* 0604*
NADAP	A	004	1498	0917	0904
NEG1	A	002	1623	1002	0159 0663 0686
NOMORE	A	004	0F82	0606	0598
NOTDON	A	004	0B15	0156	0160
NOTOO	A	001	0D30	0381	0371
NUNCK	A	004	14A9	0924	0918
NXTCYL	A	002	0FFF	0638	0198
ODD	A	004	1155	0722	0266
ODDFLG	A	001	0FE8	0620	0384* 0413 0456 0457* 0585*
ODD1	A	004	0DA6	0419	0414
OKCTR	A	001	10C3	0701	0226* 0310* 0311
ONE	A	003	13E5	0814	0186 0194 0310 0601 0603 0776 0991 1022 1027 1034 1088 1117 1118
OTORZ	A	006	1668	1031	1026*
PERROR	A	004	0A67	0073	0086
PINV	A	004	1327	0764	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
PRINT	C	001	021A	1202	0049 0055 0059 0063 0073 0110 0115 0162 0202 0300 0372 0567 0606 0666 0688 0764 0905 0955 1063 1105 1121
PRTSNS	A	004	1698	1052	0910 0919 0924
PIA3	A	004	0AF1	0134	
PIC3	A	004	0AF5	0135	
RCVDAD	A	002	17A4	1126	1074 1115
RCVMSG	A	025	17E6	1134	1079* 1080 1080* 1093* 1108
RCVMVC	A	005	172E	1093	1085* 1089*
RDDIAG	A	001	1471	0900	0895
RDFCF	A	001	1636	1016	0233* 0238 0245 0267 0269 0271 0272 0321* 0326 0335* 0339 0370 0503 0508* 0509* 0514 0546 0561 0936
RDIAG	A	006	14BA	0932	0922
RDPASS	A	001	10C6	0704	0133*
READA	A	002	10C8	0705	0234 0499 0542
READ11	A	001	0D71	0401	0385* 0460* 0586*
READ12	A	001	0E06	0452	0461* 0587*
RECLER	A	004	0B58	0174	0157
RECLSW	A	001	10C5	0703	0103* 0136 0177*
REMEXP	A	001	17ED	1138	1081* 1098* 1099
REMRCV	A	001	17EE	1139	1082* 1094* 1099 1102
REPET	A	003	14E0	0945	0954
REP10	A	006	0C9C	0310	0306
RKDN	A	005	1621	1001	0321 0335 0467 0476
RREAD	A	004	0BC8	0226	0291 0312 0357
RTN1	A	001	0A0D	0029	0015
RTN1A	A	004	0A42	0055	0080 0771
SAVXR1	A	004	1512	0964	0940*
SAVXR2	A	004	1516	0965	0941*
SBYTE2	C	001	020A	1182	
SBYTE3	C	001	020B	1183	
SBYTE4	C	001	020C	1184	0071 0083 0085 0750
SBYTE5	C	001	020D	1185	
SECTSW	C	001	020A	1181	0297 0305
SEEK	A	001	0BAA	0213	0137 0178 0187 0197 0199
SEKBSY	A	004	142A	0854	0156 0660
SEKFLG	A	002	17EA	1136	
SEKNA	A	006	0D30	0382	0411
SELA	A	004	1320	0750	
SELB	A	004	1357	0775	0751
SELCON	A	031	0A96	0100	0082* 0087* 0104
SELDSK	A	004	1318	0748	0099
SELECT	A	004	0A92	0099	0084
SENEXT	A	004	179F	1124	1052* 1053 1123*
SENSE	A	004	15F2	0990	0901 1059
SETALT	A	006	0E82	0499	0578
SETDRV	A	001	16D1	1072	1070
SETMSK	A	004	16E1	1076	1114 1119
SETRUN	A	006	13D9	0812	0784 0794 0804
SETSNS	A	006	16D5	1074	
SETSW	A	001	13EB	0818	0749*
SETUP	A	004	0A7B	0082	0072
SETYPE	A	004	0D03	0354	0320
SIO	A	003	1424	0843	0832* 0834* 0835* 0837* 0840*
SKBUSY	A	004	1025	0658	0221 0391 0495 0664
SKVER	A	006	0DFB	0449	0440
SKVER1	A	006	0F05	0542	0533
SMOD	C	001	0200	1200	
SNS	A	004	1615	0998	0993* 0994* 0997*
SNSEXT	A	004	1619	0999	0831* 0833 0992*
SNSHED	A	014	182A	1144	1066
SNSMOV	A	006	1604	0994	0990*
SNSPRM	A	001	16B5	1060	1054* 1057
SNSWDO	A	001	182B	1145	1068
SPECWT	A	001	0C4D	0278	0131* 0350* 0355*
SPUT	A	003	0A0C	0017	
SSW10	C	001	0080	1186	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SSW11	C	001	0040	1187	
SSW12	C	001	0020	1188	0297
SSW13	C	001	0010	1189	
SSW14	C	001	0008	1190	0305
SSW15	C	001	0004	1191	
SSW16	C	001	0002	1192	
SSW17	C	001	0001	1193	
SSW21	C	001	0040	1194	0071 0083 0750
SSW22	C	001	0020	1195	0071 0085 0750
SSW23	C	001	0010	1196	
SSW24	C	001	0008	1197	
STATUS	A	002	1627	1004	0903 0917 0998* 1073* 1126
STEP	A	003	1767	1109	1084 1090* 1103
STRTIO	A	004	13F0	0831	0150 0216 0235 0276 0284 0323 0336 0386 0399 0422 0431 0441 0450 0468 0477 0491 0500 0511 0524 0534 0543 0933
SVPREQ	A	002	13EF	0820	0125
TBLENA	A	002	10DB	0714	
TERMSG	A	024	12EC	0736	0205
TERROR	A	004	1461	0888	0884* 0966
THREE	A	002	13E9	0816	1123
TIOBSY	A	004	144A	0873	0781* 0792* 0802* 0810* 0872*
TIOERR	A	004	1469	0895	0779* 0790* 0800* 0808* 0887
TIOEXT	A	004	143A	0858	0854*
TIOSEK	A	004	1436	0857	0782* 0793* 0803* 0811* 0856*
TIXE	A	004	168D	1038	1028* 1035
TO	A	002	14F6	0952	0948*
TOBYT	A	006	1683	1036	1030*
TSTEXP	A	004	1737	1095	1075* 1078* 1092 1118*
TSTMSK	A	001	17A9	1129	1076
TSTRCV	A	004	1727	1091	1074* 1077* 1111 1115 1117*
TWO	A	002	13E7	0815	0107 1024
TWOASK	A	002	17E8	1135	1101
TYBOT	A	006	1662	1030	1025*
TYPE	A	001	08E5	0237	0130* 0264 0319 0348 0349* 0354*
UNITS	A	001	1692	1041	1033
UNPACK	C	001	021E	1204	0243 0248 0253 0258 0559 0563 0949
UTAB	C	001	0232	1203	0122
WDFCF	A	001	162C	1007	0134* 0135* 0153 0183 0184* 0192 0194* 0195* 0196 0198* 0214 0219 0255 0267 0269 0279 0494 0508
WORK	A	001	191A	1176	0158 0158 0662 0662 0685 0685
WRITE	A	001	0CAE	0318	0308
WRITEA	A	002	10CA	0706	0214* 0215* 0287 0430* 0434 0444
WRIT11	A	001	0DB9	0424	0462* 0588*
WRIT12	A	001	0DD1	0433	0439 0463* 0589*
WRO	A	001	0C61	0286	0132* 0351* 0356*
XREG	A	002	13ED	0819	0124
XR1	C	001	0001	1179	0038* 0043* 0155* 0159* 0659* 0663* 0682* 0686* 0775* 0783 0786 0796 0833* 0834 0835 0836 0844 0940 0942* 0945 0945* 0947 0964* 1053* 1054 1055 1061 1068* 1083 1085 1086 1087 1090 1093 1097 1109 1109* 1110 1110*
XR2	C	001	0002	1180	0039* 0040 0041 0041 0042 0042* 0941 0943* 0946 0946* 0948 0953
ZERO	A	002	17F2	1141	0965* 1057* 1058 1069 1076* 1077 1078 1113 1113*
ZROTO	A	006	1674	1033	0370 1102 1031*

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

DD90 3340 DATA MODULE INITIALIZER-- MODEL 12
OBJECT CARD LISTING

THE CHARACTER ˚ INDICATES A BLANK COLUMN AND THE CHARACTERS Ð Ē Ħ INDICATE NUMERIC SHIFT.

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
˚GBK˚GBÐ˚˚˚PN˚42	48220˚EC˚827804˚	PACK˚INITIALIZER	˚˚˚˚˚˚˚˚-˚MOD˚12	84aa84aa˚˚˚˚˚˚˚˚	˚˚˚˚˚˚˚˚DD900000
T+-Y:7R˚˚˚˚˚˚B-4	˚˚<E&˚˚D˚"""2-A#	B˚&˚OO-HO˚.1˚":3	="?"S˚?a6˚J-40˚D	ĦGC2GB/H<A˚"2C=7	˚/OH˚"-QDD900001
T+-Z5FUHTDQ.A8*B	G˚/YAN/GQOH*BF-D	,D-|˚/OHĒAS%K.%B	G˚S.A8LV-˚-32UAL	˚/OHĒ1S%LEaDAOH*	BH%D˚JCaDD900002
T+-Ðo˚*BGBUHaO&Ð	O+D˚BC|H&CC--˚-3	˚U˚ZX|<HĦV%BGD1-	˚OH*ĦW3O˚D<M<˚Aİ	IBZQ84AII@Z˚FC-˚	KKJ<˚1T-DD900003
T+-,,93,ODUX˚/OH	Ē&T<KQ*GSOH*BF-Q	XDYT˚/OHSO;H8-˚H	3a/˚H<*ML#LGED=a	a˚ACD|˚D.9LOACD4	a˚-O˚08&DD900004
T+-%WQLO˚D<Q@˚AQ	>|˚˚O<C7"D<P˚-&>	ÐOH*MM%BGBOX˚/1|	O˚˚DO.<HAA'C˚/1&	ÐOH*.O˚6|F/UĒFLQ	AES<˚'ĦYDD900005
T+-_/O˚D.E*BG˚/,	FF&_PO&.˚/OHSO&.	˚/O%5O>LS:DCT5_R	˚4'$N14CA1>|E6MC	R1*|A4@BGEE.˚/O_	-||a˚=RaDD900006
T+->*D<P˚/O>Ð|J<	˚O<|ĦA8-8˚ET˚L9*B	GB:Y'HJQ>@YDIC-˚	O./|V|˚˚O<˚4CET˚	|="HAEOOCET˚|"@B	GB:Y˚:S-DD900007
T+-?POH*BF-QQD>3	˚/OHÐ˚˚ODD<@O<CO	˚D(C˚/1|O˚˚˚O.<B	GDBP˚/1JKOH*.2CO	˚D<<a"1CZC˚O&:AC	Z|˚˚˚:IUDD900008
T+-OKETa<˚JQZD<T	˚/1|O˚&DO(%BGDGP	˚/OH;AJQ:D|"˚/OH	;BJCZDJ7˚/OH;AJQ	ODL|˚/OH;BJCLDND	<˚1˚˚2$˚DD900009
T+-1(#JER|&U.9¬H	AA-OCD+4JN&4DETY	O<|ĦAK˚4CETYO<<˚	ACJ<8˚JQ6+&HO(%B	&CJ<<˚JQZE=3˚/1|	O˚-D˚OLQDD900010
T+-2HES3˚/1A5OH*	MM%BGCE3˚/1|O˚-H	&2@BGDGP˚/1JKOH*	<*<BGB@-(BACZD(|	˚˚&4L|˚˚&1C--˚-,	2U˚-˚)C@DD900011
T+-3COH*BF-H4DJ4	8B˚HĦ@,˚DOH*<,-8	˚D<<L9L4ĦD<|˚˚&?	<OH*<WC4IB=P2˚M8	<AAQ"ESD<˚JQZE=3	˚/1<˚:#UDD900012
T+-3=a˚HHET$˚/1A	5OH*MM%BGC(M<AAQ	"ESG˚/1|O˚&<O(%B	GDGP˚/1JKOH*<#34	IB=Ma˚&?V|˚D<LLO	BCFD˚P-4DD900013
T+-49OHD.ECOIB=M	@B&1(|˚Q<Q*BGB@-	(˚1Q:E".2˚JL˚/OH	E1TMN;*DCOH*BH%D	COH*(I-ODD˚&|@-O	˚C=Q˚)#%DD900014
T+-54˚˚˚@˚˚"Y|˚D	(**BGD"˚˚˚A˚˚OH*	&I*BGEE.˚/05Q||@	&EO0<DAQ&E30˚D˚U	<˚JQZDA,˚/1|O˚&D	&Fa˚˚MH4DD900015
T+-67/1A5+&H&F"H	&˚"ĦGB&4CDA@&A|Ħ	AB<BGC8T˚/O4O|¬@	|:|ĦACC7"C=Q@˚˚"	WO˚D|*COAD˚˚@˚A˚	OC˚D˚L1˚DD900016
T+-7ÐESUP#<BGD"˚	B˚J˚˚OH*&)*BGEE.	˚/07H|˚D&2@BGD"˚	B˚/C.OH*&)*BGEE.	˚/07-|&Q(4¬ĦAE<B	GD"˚˚PY˚DD900017
T+-8V˚&<&2@BGDGP	˚/1JKOH*(=OOAESU	&F%BGD"˚A˚J˚˚OH*	&)L7"C=-a˚˚"Ya-D	Q||@|9TOACPD@˚&8	F|˚D˚",YDD900018
T+-9-C$U@˚-7JOH*	(O˚OAESUP#˚ODDA-	OH*BGD"˚BBA˚|OH*	&)*BGEE.˚/09&C˚&	&FAQ/OH*L@˚DCD"˚	˚/1˚˚".&DD900019
T+-:$)*BGEE.˚/09	ÐOH*|S<BGD"˚˚˚AQ	%OH*&I*BGEE.˚/O:	BC˚DOĦJCHOH*L@˚D	AET$˚/1A5OH*MM%B	GCZO˚POQDD900020

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DD90 3340 DATA MODULE INITIALIZER-- MODEL 12
OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-#DC˚<O+/QO|˚H	O(-OAESUP#<BGD"˚	B˚JQ6OH*&)*BGEE.	˚/O#˚|˚H&8LOHD+U	a˚ACYC˚<&9J˚DI˚˚	&9%˚˚QĒODD900021
T+-@J/1|O˚-H&8*B	GDGP˚/1JKOH*+:T4	FC_?2-JL˚/1|O˚&<	&8*BGDGP˚/1JKOH*	|A&OAESU&2<BGD"˚	A˚JQ˚@B4DD900022
T+-'<(%BGDGP˚/1J	KOH*|G37"C=*a˚&:	(|˚D+%LOBC_%a˚&a	&|˚˚|9"HAG%BG˚/8	DETYN2<&G˚/8DD+M	N8<˚˚5J%DD900023
T+-=G/OHĒATDN@*B	GB6-@B&:(|˚U+%LO	FC_%@B&@&||@|9@B	GCYH@"O"Y|˚U(*LO	IC-Q@B&69|˚Q(4*6	GCN-˚)O*DD900024
T+-"B(˚-|2&4CC"H	|°"ĦAGL4LC".2-&U	+˚˚"2D=P2/2D+˚&"	OD=Ma˚˚"2@ᵛ*MOH*	BF%Q*C=PAA<BG˚S.	AA<˚˚*.8DD900025
T+-"'/O=@OH*˚˚(P	O&(LO6*N˚O)|T1)X	NO;|E8UCA9*GI4@G	B4@M˚˚˚˚˚˚BH˚˚˚˚	˚H-˚˚˚˚˚S˚˚-˚H-˚	˚˚8H˚9Ħ*DD900026
T+/˚8˚˚_˚˚˚˚˚˚˚	˚˚˚_˚˚˚˚˚˚˚˚˚˚	˚˚˚˚˚˚˚˚˚D˚@˚˚˚˚	˚˚˚˚˚˚˚˚˚(˚-&)<H	AA'C˚/1&ÐOH*&*&6	|F/U˚QSYDD900027
T+/A3F/U6˚JQTO˚D	&Ħ*BG˚/,FF/AOO&P	˚/OHSO&P˚/1A(O>L	S:DCT5_R˚4'$N14C	A1>|E6MCA&+.E1).	˚/O˚˚;#˚DD900028
T+/B>˚C&HD<.B˚&F	&OH*M|%BGD.@(T1Y	RF/U6˚JQTO˚D&;*B	G˚/,FFAB=O&$˚/OH	SO&$˚/1B!O;|TO*|	H5<M˚QSODD900029
T+/CZ5;(˚O>LS:DC	T5_R˚4'$N1@BG˚˚˚	˚˚˚˚˚D+D&5<$CO@T	H˚˚˚˚B˚˚˚O@|H2AC	Ē1%|C2<TFO@|H2|C	O@|-˚'E*DD900030
T+/DUQ+¬X96A˚2<E	˚6*J˚9=¬X9=¬X9=¬	X94A˚&DA˚&(XO&(X	D&+¬X9=¬X9=¬X9=¬	X9=¬X9=¬X9@TA&DC	S2(<˚$HDDD900031
T+/E¬1DCB1MCX9=¬	X9=¬X9=¬X&(XO&+.	H42J˚O%N˚9=¬X9=¬	X9=¬X9=¬X9=¬X9=¬	X5%LDQ<PV1)PO4UC	E6)U˚4Z4DD900032
T+/FĒa"|4@DCC1MC	PO*|K&<XN2;|IO)|	I:*GT2)$N&(¬R5%¬	RO)LA&+.E5;.E&+.	W2;|C2DCM9+.T&<.	E&+H˚:IYDD900033
T+/GN1;(˚8'R˚2)P	D2*|A8@N˚9%TE6*N	˚8@TE5<LA8@E˚5($	D9(|E&+|O&<.E&<X	N2;|IO)|I:*PD&(X	E8%U˚;ĒHDD900034
T+/H&1<PS8%PT&+.	W2;|C2DC2@MCO6MC	2@UCT5UCS1)|EO=(	˚1(XI9*N˚@MCO6MC	2K=.E84CO5*N˚8>$	I8@<˚#00DD900035
T+/I.2DCA5*J˚6*P	S1;(˚2<GL84CT5UC	C5_PT2)PU1MA˚1<G	TOMCH5%LU4@N˚5_N	˚@"|4@DCD6*XV1MC	X&+Q˚;3*DD900036
T+/ĦF2)|L&(PO9UC	B1MCI5*XT2*GL2;X	E1(XE8%PT&+|H2;1	˚2<GL84CT5UCB1*¬	I5MCI5*XT2*GL2;X	A8@U˚5E&DD900037
T+/.A5_N*PE1*PE1	*PE1*PE1*PE1*PE1	*PE1*PE1*PE1*PE1	*PE1*PE1*PE1*PE1	*PE1*PE1*PE1*PE1	*PEO˚2L8DD900038
T+/.@PE1*PE1*PE1	*PE1*PE1*PE1*P<X	N2;|IO)|I:*GT2)$	N&<|O5(¬L1;|E1(P	O&+.E5;.E&+.W2;|	C2D˚˚2HHDD900039
T+/<79%GS&+.E84C	F5_V˚1(XI9*N˚8%P	L1*|T2)$N(˚-L8T3	"D=%8Q˚H<@2˚OOH*	BF%Q*D5$AA@BG˚S.	AA@˚˚*C0DD900040
T+/(2/OZB2)PVO)|	I1DCS1)PS1MCS9%X	TO@/˚8%PT8@XN13M	AD=H+˚J|SD=M@0A|	Ð|<QMGL3˚EFY@1A&	/|<H˚MZODD900041
T+/+_ED%@OJ&7¬*D	˚@YEĒ¬*H˚@-D$|<-	L:T3+EA4@2AJÐ|<O	MHL3ĦED%@2J&7@Y*	9¬)D˚@-D$|(˚L:T3	OEA4˚7$4DD900042

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DD90 3340 DATA MODULE INITIALIZER-- MODEL 12

OBJECT CARD LISTING

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

T+/|Y|(°MET3MEBD  a4/J.|(DM(*HGFC3  QD=Ya7/&)|(-MET3  *EBDa6/J.|(UM(08  AD=HOI*BG°°°°°°D  °°-°°R.%DD900043
T+/&T°O°°-°D°°3&  HE/0<°A&VD=Y5°JQ  *F°<MI&°*°A&W°JO  AES%C+0-MILUHD=,  2D°&:BA&V<*QOR3G  DESU°8I<DD900044
T+/J;aa°°4H*D(°-  M|LQHESM4BA&90*D  °°<BG°°°4BAJJ(--  OIL&HED7AO-°°OH*  °°C&HEF&6BAQV(°-  ME|H°O1ODD900045
T+/KR/OT°/O°°OH*  °°<G°EGG°/1JVOH*  Na-M8°JQXaZ°$OH*  BF%H(EMLAB<BGEZS  E°°C°/OHSO&T°/1K  ++¬°°L2<DD900046
T+/LMES$2D°,°/1E  Q/&°°aY*JOH*OWHM  °°<BG°S.AB%BGE.°  <°JQZEL¬°/1|O°&*  O(%BGDGP°/1L&(°D  NEL&°KTMDD900047
T+/M|°/MRO-DNG*H  BEQ|K°&.S°-M4°JL  4(°HH*%BG°/8B°°°  °°.7*°*°AE+C°/OH  E1UQN?aDIOH*BH%D  IOH*°PI%DD900048
T+/NHE&TB°&°°O-H  °°<BGEFD°°°°°°°°  °°°°°°°°°°°°°°°°  °°°°°°°°NG%GDO)¬  T1)V°OaTEO*.C:((  °aF%°L°aDD900049
T+/OE&<TD&|A°2;I  °1<PF1*|T2;PEQ<L  A8aE°5($D9(|E&(L  U8>(°O%N°6*PPO*X  R1*LD2*GG&+.E5:.  EQ+*°&CMDD900050
T+/P°9=¬X&+¬X9=),°9=¬X94CX9=¬X&+¬  X9=)°9=¬X94CX9=¬  X&+¬X9=)°9=¬X94C  X9=¬X&+¬X9=)°9=¬  X9*a°5/<DD900051
T+/P#UaICCaTH2</  °2;I°1<PF1*|T2;P  EK4_.Oa|COaTH2</  °2;I°8aTE&<GL8aP  R5*GT1L&HE-J6BA|  V(°-°JJODD900052
T+/Q6E/O<°AQOD=Y  H°1QO°°°8BA|DaZ°  D+--OETC°ES¬°/O°  °°&°A°B***O°D°°°  O°°°°°°°°°°°°°°°  °°°°°3IYDD900053
T+/R1°°°°°°°°°°°  °(--L9L&HEWD6BA|  X(°-OR3&HEW46BA|  V(°-OU°OAEX<°°°O  AEYQ°°°OAEX*°°°O  °EZD°OTHDD900054
T+/E%°°°DH°°°EZH  |°AEJD=P2--YFD°°  °EZ¬°/1R:OH*°°°C  Oa|COa|D4BA;S(&D  PY/O°E,M°G°DPD°.  B°/Q°K,<DD900055
T+/$X_$>°°<BGE¬H  °;H°°aZ°HOH*BF-H  6FB,B°J-,?&M°aYD  Ca°°°+8QOIOOAE2Y  PZ°OAE3YPZ%HBE:U  %°A*°OC<DD900056
T+/*SH°°%°A*8°C1  °E=Q<(A¬VE=Qa°A¬  _|°°P#X4°°|HAO1O  °E2a°G°°P|O°*°A)  B°°8°E4HL9&O°E3H  P&/O°OJ&DD900057
T+/))°A)Z°C-°°°C  2U°U*FA¬W°C3*E=8  8°°°°aZ°IGA-P3&°  a*1¬_C&°P#J¬>aYD  FC°DP%1¬YC&DP#/¬  2aYD°PL8DD900058
T+/;QB<BG°/YA(/¬  W4-DR4-DB|&DPH|H  AA=HB°*BGE>M(°J*  DE:L2°J°+°J*DD=M  +°J*:D=P°/1$/OH*  BF/Q°4&*DD900059
T+/¬LC-DPY/|ZOH*  °°AQWE:*°°HA°HA°  HA°HA°°°°°DA°&DA  °&DA°&DA°&DA°&DA  °&DA°&DA°&DA°&DA  °&D°°JB-DD900060
T+/-+&DA°&DA°&DA  °&DA°&DA°&DA°&E1  *°°°O°°°°°°°°°°|*  *1)XR&DA°&DA°1;¬  P1*|T1*J°8%PN8%N  °&D°°M$DDD900061
T+//I&DA°&DA°&DA  °6*PC1*XV1*J°8%P  N8%N°&DA°&A.U5*X  T&<|H1*|KE4CD6*X  V1MC1D>LN2;(°OaT  EO*H°OZ4DD900062
T+/SDE4CD6*XV1MC  2D>LN2;(°OaTEO*I  ,&<LR2;PE&|<K9(P  I84CC2<PC4W_°1(X  I9*N°*APS1*PK&<|  O5(*°*#°DD900063
T+/S*4aPT1O_°1(X  I9*N°aJPS1*PK&<|  O5(¬L1;|EE4CD6*X  V1MC2E;.E1)I°O*$  M5*|E8aN,&<LR2;P  E&|<°O1MDD900064
```


DD90 3340 DATA MODULE INITIALIZER-- MODEL 12

OBJECT CARD LISTING

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

T+/T:E;.E1)I°O*$  M5*|E8aN,&<LR2;P  E&|&°°°XSOaGN&<P  Q9<GLE)¬R5%¬RO)J  °4*$A1FCR1)LO9*G  B4aM°9BUDD900065
TG/URA)$P&<PN1°L  N5UCO5O°°°°°<O*L  A5=|E6MCC2<PC4-°  °°°°°°°°°°°°°°°°  °°°°°°°°°°°°°°°°  °°°°°*Z°DD900066
E°°A*E7*=¬DC*PH$  =*7M&F|°°°|°°°C°  °°F%°°°ASC°°°R°A  SO°°°Q°°°°°°°°°°  °°°°°15120630750  827752-UDD900067
```

LAST PAGE

D443 S/3 3340 AND CARD UTILITIES --- MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                                                                    LAST CHG :03:09:76
                                 2 *
                                 3          DECK  4
                                 4          SEQ   0
    0000                         5 D443     START 0
                                 6          TREP
    0A00                         7          ORG   X'0A00'
                                 8
                                 9 ***********************************************************
                                10 *                 SECTION PREFACE                           *
                                11 *                                                           *
    0A00 D443              0A01 12          DC    XL2'D443'
    0A02 00                0A02 13          DC    XL1'00'          SECTION FLAGS
    0A03 01                0A03 14          DC    XL1'01'          ROUTINE NO.
    0A04 0000              0A05 15          DC    XL2'00'          RESERVED
    0A06 506E              0A07 16          DC    AL2(RTN01)       ADDRESS OF FIRST ROUTINE PREFIX
    0A08 0000              0A09 17          DC    AL2(*-*)         ADDRESS OF ERROR RECORDING TABLE
    0A0A F00000            0A0C 18 UMFCU    DC    XL3'F00000'
    0A0D 100000            0A0F 19 U5471    DC    XL3'100000'
    0A10 510000            0A12 20 U1442    DC    XL3'510000'
    0A13 400000            0A15 21 U3741    DC    XL3'400000'
    0A16 C15000            0A18 22          DC    XL3'C15000'
                                23 *                                                           *
                                24 ***********************************************************
    0A80                        25          ORG   X'0A80'
                           0A80 26 READIN   EQU   *
    0A80                   0AFF 27          DS    CL128
                           0B00 28 SAVCRD   EQU   *
    0B00                   0BFF 29          DS    CL256
                                30 *
                                31 *
                                32 *
                                33 *       BUFFER MUST CONTAIN SPACE FOR 200 80 COLUMN CARDS (MUST BE
                                34 *         ON A 256 BYTE BOUNDARY)
                                35 *
                                36 *
                           0C00 37 BUFFER   EQU   *
    0C00                   4A7F 38          DS    200CL80
    4A80                   4ABF 39          DS    CL64
                           4AC0 40 PRTBUF   EQU   *
    4AC0                   4B3F 41          DS    CL128
    5000                        42          ORG   X'5000'
                           5000 43 DGSNSB   EQU   *
    5000                   5017 44 DGSNS1   DS    XL24
                           5017 45 DGS2B    EQU   *-1
    5018                   506D 46 DGSNS2   DS    XL86
                                47
                                48 *
                                49 *                 ROUTINE PREFACE
                                50 *
    506E 01                506E 51 RTN01    DC    XL1'01'          ROUTINE NUMBER
    506F 00                506F 52          DC    XL1'00'          ROUTINE FLAGS
    5070 FFFF              5071 53 MINUS1   DC    XL2'FFFF'        ADDRESS OF NEXT ROUTINE
                                54
    5072 38 80 0233             55          TBN   UTAB+1,X'80'     IF NOT RUNNING FROM DISK, SET
    5076 F2 10 08               56          JT    *+11             SVPREQ LATCH (ALLOWS USAGE OF 12
    5079 31 C5 71DD             57          LIO   XREG,X'C5'       MBYTE DATA MODULE)
    507D 31 C5 71E1             58          LIO   SVPREQ,X'C5'
                                59
                                59
                                60 ***********************************************************
                                61 *                                                           *
                                62 *       OPERATING INSTRUCTIONS                              *
                                63 *                                                           *
                                64 *       AT THE FIRST HALT, SET THE FOLLOWING SWITCHES:      *
                                65 *                                                           *
                                66 *       1. SET NO SWITCHES TO RUN ON DRIVE 1                *
                                67 *       2. SET SWITCH 22 TO RUN ON DRIVE 2                  *
                                68 *       3. SET SWITCH 17 TO USE THE 3741 AS THE OUTPUT DEVICE. *
```


D443 S/3 3340 AND CARD UTILITIES --- MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                                69 *       4. SET SWITCH 18 TO USE THE 1442 AS CARD DEVICE.  *
                                70 *       5. SET SWITCH 1A TO USE THE MFCU AS CARD DEVICE.  *
                                71 *                                                           *
                                72 ***********************************************************
                                73
                                74 *
                                75 * DISPLAY FUNCTION OPTION MENU
                                76 *
                           5081 77 FMENU    EQU   *
    5081 C0 87 641A             78          B     SELDRV           GO GET DRIVE SELECTED
    5085 C0 87 021A             79          B     PRINT1           GO DISPLAY MESSAGE
    5089 02                5089 80          DC    XL1'02'
    508A 23                508A 81          DC    AL1(MENU11-MENU1)
    508B 6820              508C 82          DC    AL2(MENU11)      MSG. SELECT OPTION
    508D C0 87 021A             83          B     PRINT1           GO DISPLAY MESSAGE
    5091 01                5091 84          DC    XL1'01'
    5092 0C                5092 85          DC    AL1(MENU12-MENU1A)
    5093 682C              5094 86          DC    AL2(MENU12)      MSG. SELECT OPTION
    5095 C0 87 021A             87          B     PRINT1           GO DISPLAY MESSAGE
    5099 01                5099 88          DC    XL1'01'
    509A 1D                509A 89          DC    AL1(MENU13-MENU1B)
    509B 6849              509C 90          DC    AL2(MENU13)      MSG. SELECT OPTION
    509D C0 87 021A             91          B     PRINT1           GO DISPLAY MESSAGE
    50A1 01                50A1 92          DC    XL1'01'
    50A2 0D                50A2 93          DC    AL1(MENU14-MENU1C)
    50A3 6856              50A4 94          DC    AL2(MENU14)      MSG. SELECT OPTION
    50A5 C0 87 021A             95          B     PRINT1           GO DISPLAY MESSAGE
    50A9 01                50A9 96          DC    XL1'01'
    50AA 0D                50AA 97          DC    AL1(MENU15-MENU1D)
    50AB 6863              50AC 98          DC    AL2(MENU15)      MSG. SELECT OPTION
    50AD C0 87 021A             99          B     PRINT1           GO DISPLAY MESSAGE
    50B1 01                50B1 100         DC    XL1'01'
    50B2 23                50B2 101         DC    AL1(MENU16-MENU1E)
    50B3 6886              50B4 102         DC    AL2(MENU16)      MSG. SELECT OPTION
    50B5 C0 87 021A             103         B     PRINT1           GO DISPLAY MESSAGE
    50B9 01                50B9 104         DC    XL1'01'
    50BA 1E                50BA 105         DC    AL1(MENU17-MENU1F)
    50BB 68A4              50BC 106         DC    AL2(MENU17)      MSG. SELECT OPTION
    50BD C0 87 021A             107         B     PRINT1           GO DISPLAY MESSAGE
    50C1 02                50C1 108         DC    XL1'02'
    50C2 16                50C2 109         DC    AL1(MENU18-MENU1G)
    50C3 68BA              50C4 110         DC    AL2(MENU18)      MSG. SELECT OPTION
    50C5 C0 87 021A             111         B     PRINT1           GO DISPLAY MESSAGE
    50C9 02                50C9 112         DC    XL1'02'
    50CA 20                50CA 113         DC    AL1(MENU19-MENU1H)
    50CB 68DA              50CC 114         DC    AL2(MENU19)      MSG. SELECT OPTION
    50CD 38 20 0A0E             115         TBN   U5471-1,X'20'    5471 PRESENT
    50D1 F2 90 08               116         JF    DSKMSG           NO,PRINT ALTERNATE MSG
    50D4 C0 87 021A             117         B     PRINT1           GO DISPLAY MESSAGE
    50D8 02                50D8 118         DC    XL1'02'
    50D9 28                50D9 119         DC    AL1(MENU10-MENU1I)
    50DA 6902              50DB 120         DC    AL2(MENU10)      MSG. SELECT OPTION
    50DC C0 87 021A             121 DSKMSG  B     PRINT1           GO DISPLAY MESSAGE
    50E0 06                50E0 122         DC    XL1'06'
    50E1 14                50E1 123         DC    AL1(DSKXX-KBRDYB)
    50E2 6F3B              50E3 124         DC    AL2(DSKXX)       WHICH DISK MSG
                                125
                                126 **********************************************************
                                127 *                                                          *
                                128 *      THIS ROUTINE INTERPRETS REPLY TO FUNCTION OPTION MENU AND *
                                129 *      BRANCHES TO EXECUTE ONE OF THE FOLLOWING FUNCTIONS:  *
                                130 *      OPTIONS ARE:                                        *
                                131 *                                                          *
                                132 *      1 --- KEYPUNCH - PROVIDES 1442 OR MFCU AS KEYPUNCH VIA *
                                133 *                       PRINTER/KEYBOARD.                  *
                                134 *      2 --- DUP -      DUPLICATE 80 COLUMN CARD DECKS.    *
                                135 *      3 --- VTOCDUMP - PROVIDE LISTING OF VTOC INCLUDING DISK *
                                136 *                       ADDRESS & PROGRAM LINKAGE INFORMATION *
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           137 *                          CONTAINED IN EACH VTOC ENTRY.          *
                           138 *       4 --- DUMP -       DISK DUMP PROVIDING PRINTOUT OF CONTENTS *
                           139 *                          OF SPECIFIC DISK LOCATION.             *
                           140 *       5 --- PUNCH -      PUNCH A SPECIFIC PROGRAM FROM DISK ONTO *
                           141 *                          80 OR 96 COLUMN CARDS OR WRITE TO DISKETTE.*
                           142 *       6 --- PATCH -      DISK PATCH CAPABILITY                  *
                           143 *       9 ---------- TERMINATES SECTION                          *
                           144 *
                           145 ********************************************************************************
 50E4 38 20 0A0E           146 REDO    TBN    U5471-1,X'20'       5471 ON THE SYSTEM
 50E8 F2 10 22             147         JT     GET1                5471 WILL BE USED AS INPUT
 50EB C0 87 021A           148         B      PRINT               PRINT MSG FOR USING CPU SW.
 50EF 06             50EF  149         DC     XL1'06'             SPACE
 50F0 46             50F0  150         DC     IL1'70'             MSG LENGTH
 50F1 6DD8           50F2  151         DC     AL2(MENU70)         MSG @
 50F3 C0 87 0222           152         B      HALT                ELSE USE THE CPU DATA SWITCHES
 50F7 D4E1           50F8  153         DC     XL2'D4E1'           ISSUE HALT FOR INPUT FROM SWITCHES
 50F9 30 00 71DF           154         SNS    WORK,X'00'          READ THE DATA SWITCHES
 50FD 0C 00 0A80 71DF      155         MVC    READIN(1),WORK      MOVE IN THE OPTION SELECTED
 5103 08 00 0A80 510C      156         MZZ    READIN,F0           CONVERT TO CHARACTER
 5109 F2 87 05             157         J      RD2                 CHECK OPTION SELECTED
 510C F0             510C  158 F0      DC     XL1'F0'
                     0000  159 ZER     EQU    X'00'
                           160 *
 510D C0 87 6210           161 GET1    B      RECORD              READ A RECORD
 5111 C0 87 0212           162 RD2     B      TEST                GO SEE IF ANY SSW'S HAVE BEEN SET
 5115 3D F9 0A80           163         CLI    READIN,C'9'         TERMINATE FUNCTION
 5119 C0 81 5161           164         BE     END
 511D 3D F1 0A80           165         CLI    READIN,C'1'         'KEYPUNCH' ENTERED?
 5121 C0 81 596A           166         BE     PUNCH
 5125 3D F2 0A80           167         CLI    READIN,C'2'         'DUP' ENTERED?
 5129 C0 81 588A           168         BE     DUP
 512D 3D F3 0A80           169         CLI    READIN,C'3'         'VTOCDUMP' ENTERED?
 5131 C0 81 5165           170         BE     VTOCDP
 5135 3D F4 0A80           171         CLI    READIN,C'4'         'DUMP ' ENTERED?
 5139 C0 81 531E           172         BE     DDUMP
 513D 3D F5 0A80           173         CLI    READIN,C'5'         'PUNCH ' ENTERED?
 5141 C0 81 5638           174         BE     DPUNCH
 5145 3D F6 0A80           175         CLI    READIN,C'6'         'PATCH ' ENTERED?
 5149 C0 81 59A9           176         BE     DPATCH
                           177 *
                           178 *       IF OPTION NOT PROPERLY ENTERED, DISPLAY
                           179 *       MESSAGE WHICH INDICATES ERROR MADE ON FUNCTION
                           180 *       OPTION MENU.
                           181 *
 514D C0 87 021A           182         B      PRINT1              GO DISPLAY MESSAGE
 5151 C6             5151  183         DC     XL1'C6'
 5152 26             5152  184         DC     IL1'38'
 5153 692D           5154  185         DC     AL2(ERR1)           MSG. ERROR ON MENU
 5155 D4B7           5156  186         DC     XL2'D4B7'           DISPLAY HALT
 5157 C0 87 0222           187         B      HALT                  '87'
 515B D4B7           515C  188         DC     XL2'D4B7'
 515D C0 87 50E4           189         B      REDO
                     5161  190 END     EQU    *                   TERMINATE SECTION.
 5161 C0 87 0216           191         B      LINK                LOAD DCP FOR
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           193 ********************************
                           194 *       VTOC DUMP SUBROUTINE   *
                           195 ********************************
                     5165  196 VTOCDP  EQU    *
 5165 3C 01 702C           197         MVI    COUNTR,1            INITIALIZE SUBROUTINE COUNTER
 5169 C0 87 021A           198         B      PRINT               PRINT 1ST LINE OF HEADING
 516D 01             516D  199         DC     XL1'01'             SPACE ONE
 516E 47             516E  200         DC     IL1'71'             LENGTH
 516F 52A1           5170  201         DC     AL2(HEAD1)          ADDR OF LAST PRINT CHAR
 5171 C0 87 021A           202         B      PRINT               PRINT 1ST LINE OF HEADING
 5175 01             5175  203         DC     XL1'01'             SPACE ONE
 5176 21             5176  204         DC     IL1'33'             LENGTH
 5177 52C2           5178  205         DC     AL2(HEAD2)          ADDR OF LAST PRINT CHAR
 5179 0C 04 646E 62F0      206         MVC    DDCFM(5),VTOCAD     SET DISK FIELD TO VTOC ADDRESS
                           207
 517F C0 87 5215           208 RDVTO   B      VREAD               READ A RECORD IN VTOC
                           209
 5183 1D 02 5253 02        210         CLC    CACT(3),2(,XR1)     CHECK FOR 'ACT' IN COL. 0-2
 5188 F2 81 09             211         JE     ACTOK               BRANCH BACK TO MAIN MENU IF NOT
 518B C0 87 021A           212         B      PRINT               SPACE
 518F 16             518F  213         DC     XL1'16'               SIX
 5190 C0 87 5081           214         B      FMENU
 5194 1D 02 5256 06        215 ACTOK   CLC    COLD(3),6(,XR1)     CHECK FOR 'OLD' IN COL. 5-7
 5199 F2 01 08             216         JNE    NOCHK               SKIP SSW CHECK IF NOT
 519C 38 80 020C           217         TBN    SBYTE4,SSW20        TEST SSW 20
 51A0 C0 90 517F           218         BF     RDVTO               IF ON, PRINT 'OLD'S
 51A4 1C 02 52C5 06        219 NOCHK   MVC    PID(3),6(,XR1)      MOVE PROG ID # INTO PRINT LINE
 51A9 1C 00 5257 0B        220         MVC    CYL3(1),11(,XR1)    MOVE CYL ADDR FROM REG TO ADDR
 51AE C0 87 021E           221         B      UNPACK              UNPACK CYL ADDR
 51B2 01             51B2  222         DC     IL1'1'              MOVE ONE CHARACTER
 51B3 5257           51B4  223         DC     AL2(CYL3)           FROM REGISTER
 51B5 52C9           51B6  224         DC     AL2(HCYL3)          TO PRINT LINE
 51B7 1C 00 5258 0D        225         MVC    SEC3(1),13(,XR1)    MOVE HEAD   ADDR FROM TO ADDR
 51BC C0 87 021E           226         B      UNPACK              UNPACK HEAD   ADDR (HEX)
 51C0 01             51C0  227         DC     IL1'1'
 51C1 5258           51C2  228         DC     AL2(SEC3)
 51C3 52CE           51C4  229         DC     AL2(HSEC3)
 51C5 1C 00 5259 0E        230         MVC    REC3(1),14(,XR1)    MOVE RECORD ADDR FROM TO ADDR
 51CA C0 87 021E           231         B      UNPACK              UNPACK RECORD ADDR (HEX)
 51CE 01             51CE  232         DC     IL1'1'
 51CF 5259           51D0  233         DC     AL2(REC3)
 51D1 52D2           51D2  234         DC     AL2(HREC3)
 51D3 0C 02 52D8 5250      235         MVC    DSEC#(3),DEC1       CHANGE # OF RECORDS (HEX)
 51D9 4F 01 15 524A        236 LOOP1   SLC    21(2,XR1),HEX1      TO PRINTABLE DECIMAL
 51DE C0 81 51EC           237         BZ     NUMOK               AND SET INTO
 51E2 06 20 52D8 5250      238         AZ     DSEC#(3),DEC1(1)    PRINT LINE
 51E8 C0 87 51D9           239         B      LOOP1
 51EC 1C 01 52DC 08        240 NUMOK   MVC    PPLVL(2),8(,XR1)    MOVE PROG LEVEL INTO PRINT LINE
 51F1 1C 00 525A 17        241         MVC    STFLG(1),23(,XR1)   MOVE SYS. TEST FLAG
 51F6 C0 87 021E           242         B      UNPACK              UNPACK SYS. TEST FLAG (HEX)
 51FA 01             51FA  243         DC     IL1'1'
 51FB 525A           51FC  244         DC     AL2(STFLG)
 51FD 52E1           51FE  245         DC     AL2(HSTFLG)
 51FF 1C 14 52FB 9F        246         MVC    PPNEC(21),159(,XR1) MOVE PN & EC # INTO PRINT LINE
 5204 1C 1F 531D BF        247         MVC    PDESC(32),191(,XR1) MOVE PROG DESC INTO PRINT LINE
 5209 C0 87 021A           248         B      PRINT               PRINT LINE OF DATA
 520D 01             520D  249         DC     XL1'01'             SPACE ONE
 520E 5B             520E  250         DC     IL1'91'             LENGTH
 520F 531D           5210  251         DC     AL2(PDESC)          ADDR OF LAST PRINT CHAR
 5211 C0 87 517F           252         B      RDVTO               DO NEXT LINE
                           253 *
                           254 *       SUBROUTINE TO READ A RECORD IN FROM VTOC (ACTUALLY READS IN A
                           255 *       TRACK AT A TIME AND ADJUSTS XR1)
                           256 *
 5215 34 08 5229           257 VREAD   ST     VREADR+3,ARR        SAVE RETURN ADDRESS
 5219 0F 00 702C 7015      258         SLC    COUNTR(1),ONE       SUBTRACT COUNTER.  IF ZERO, THEN
 521F F2 81 08             259         JZ     VREADR+4            READ IN 48 MORE RECORDS
 5222 36 01 524D           260         A      X256,XR1            INCREMENT FIELD POINTER
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   5226 C0 87 0000            261 VREADR B     *-*              RETURN TO CALLER
   522A 3C 30 702C            262        MVI   COUNTR,48        INITIALIZE FIELDS TO READ IN 48 MORE
   522E 3C 2F 6472            263        MVI   DDCF,47          RECORDS
   5232 C2 01 0C00            264        LA    BUFFER,XR1
   5236 C0 87 6475            265        B     WINRW            READ 48 RECORDS
   523A 80                523A 266        DC    XL1'80'          READ FLAG
   523B 0C00              523C 267        DC    AL2(BUFFER)
   523D 6469              523E 268        DC    AL2(DDCFB)
   523F C0 87 6284            269        B     STPFLD           INCREMENT DISK CONTROL FIELD
   5243 646E              5244 270        DC    AL2(DDCFM)       POINTER POINTING TO RECORD BYTE
   5245 C0 87 5226            271        B     VREADR           RETURN TO CALLER
                              272
   5249 0001              524A 273 HEX1   DC    IL2'1'           HEX 'ONE'
   524B 000100            524D 274 X256   DC    IL3'256'
   524E F0F0F1            5250 275 DEC1   DC    CL3'001'         DECIMAL 'ONE'
   5251 C1C3E3            5253 276 CACT   DC    CL3'ACT'
   5254 D6D3C4            5256 277 COLD   DC    CL3'OLD'
   5257 00                5257 278 CYL@   DC    XL1'00'
   5258 00                5258 279 SEC@   DC    XL1'00'
   5259 00                5259 280 REC@   DC    XL1'00'
   525A 00                525A 281 STFLG  DC    XL1'00'
                              282 *
                              283 *       VTOC LISTING HEADING
                              284 *
   525B D7C7D44040D7C7D4 5281 285        DC    CL39'PGM  PGM LOCATION  REC  PGM  SYSTEM  PN'
   5263 40D3D6C3C1E3C9D6      285
   526B D54040D9C5C34040      285
   5273 D7C7D44040E2E8E2      285
   5278 E3C5D44040D7D5        285
   5282 40C1D5C440C5C340 52A1 286 HEAD1  DC    CL32' AND EC NUMBER       DESCRIPTION'
   528A D5E4D4C2C5D94040      286
   5292 4040404040C4C5E2      286
   529A C3D9C9D7E3C9D6D5      286
   52A2 C9C4404040C3E8D3 52C2 287 HEAD2  DC    CL33'ID   CYL  HD  REC   #   LEV  FLAG'
   52AA 4040C8C44040D9C5      287
   52B2 C340404078404040      287
   52BA D3C5E54040C6D3C1      287
   52C2 C7                    287
                              288 *
                              289 *       VTOC PRINT LINE
                              290 *
   52C3 404040            52C5 291 PID    DC    CL3' '
   52C6 4040              52C7 292        DC    CL2' '
   52C8 4040              52C9 293 HCYL@  DC    CL2' '
   52CA 404040            52CC 294        DC    CL3' '
   52CD 4040              52CE 295 HSEC@  DC    CL2' '
   52CF 4040              52D0 296        DC    CL2' '
   52D1 4040              52D2 297 HREC@  DC    CL2' '
   52D3 404040            52D5 298        DC    CL3' '
   52D6 404040            52D8 299 DSEC#  DC    CL3' '
   52D9 404040            52DB 300        DC    CL3' '
   52DC 40                52DC 301 PPLVL  DC    CL1' '
   52DD 404040            52DF 302        DC    CL3' '
   52E0 4040              52E1 303 HSTFLG DC    CL2' '
   52E2 4040404040        52E6 304        DC    CL5' '
   52E7 4040404040404040 52FB 305 PPNEC  DC    CL21' '
   52EF 4040404040404040      305
   52F7 4040404040            305
   52FC 4040              52FD 306        DC    CL2' '
   52FE 4040404040404040 531D 307 PDESC  DC    CL32' '
   5306 4040404040404040      307
   530E 4040404040404040      307
   5316 4040404040404040      307
                          531E 308 PLINE  EQU   *
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              310 ************************************
                              311 *       DISK DUMP SUBROUTINE       *
                              312 ************************************
                          531E 313 DDUMP  EQU   *
                              314 *
                              315 *       DISPLAY DISK DUMP MENU
                              316 *
   531E C0 87 021A            317        B     PRINT1           GO DISPLAY MESSAGE.
   5322 02                5322 318        DC    XL1'02'
   5323 0F                5323 319        DC    AL1(MENU2A-MENU21)
   5324 6962              5325 320        DC    AL2(MENU2A)      MSG. SELECT DUMP ADDR.
   5326 C0 87 021A            321        B     PRINT1           GO DISPLAY MESSAGE.
   532A 02                532A 322        DC    XL1'02'
   532B 23                532B 323        DC    AL1(MENU20-MENU2)
   532C 6985              532D 324        DC    AL2(MENU20)      MSG. SELECT DUMP ADDR.
   532E C0 87 021A            325        B     PRINT1           GO DISPLAY MESSAGE.
   5332 01                5332 326        DC    XL1'01'
   5333 0C                5333 327        DC    AL1(MENU2B-MENU22)
   5334 6AB6              5335 328        DC    AL2(MENU2B)      MSG. SELECT DUMP ADDR.
   5336 C0 87 021A            329        B     PRINT1           GO DISPLAY MESSAGE.
   533A 01                533A 330        DC    XL1'01'
   533B 11                533B 331        DC    AL1(MENU2C-MENU23)
   533C 6AC7              533D 332        DC    AL2(MENU2C)      MSG. SELECT DUMP ADDR.
   533E C0 87 021A            333        B     PRINT1           GO DISPLAY MESSAGE.
   5342 06                5342 334        DC    XL1'06'
   5343 18                5343 335        DC    AL1(MENU2D-MENU24)
   5344 6ADF              5345 336        DC    AL2(MENU2D)      MSG. SELECT DUMP ADDR.
   5346 38 20 0A0E            337        TBN   U5471-1,X'20'     5471 PRESENT
   534A F2 10 21              338        JT    READ1            YES, BYPASS USING SWITCHES
   534D C0 87 021A            339        B     PRINT             PRINT MSG FOR USING SW
   5351 06                5351 340        DC    XL1'06'          SPACE
   5352 46                5352 341        DC    IL1'70'          MSG LENGTH
   5353 6DD8              5354 342        DC    AL2(MENU70)      MSG @
   5355 C0 87 0222            343        B     HALT             DISPLAY HALT FOR INPUT
   5359 D4E1              535A 344        DC    XL2'D4E1'        THROUGH CPU SWITCHES
   535B 30 00 71DF            345        SNS   WORK,X'00'        PICK UP OPTION FROM SW'S
   535F 0C 00 0A80 71DF       346        MVC   READIN(1),WORK   MOVE IN OPTION
   5365 08 00 0A80 510C       347        MZZ   READIN,F0        CONVERT TO CHARACTER
   536B F2 87 04              348        J     RD1              BYPASS READ FROM 5471
   536E C0 87 6210        349 READ1  B     RECORD           READ RECORD
   5372 3D F1 0A80        350 RD1    CLI   READIN,C'1'      DUMP OPTION SELECTED
   5376 F2 01 9A              351        JNE   CHNXT            NO,CONTINUE CHECKING
   5379 C0 87 021A            352        B     PRINT1           PRINT INSTRUCTION FOR DISK DUMP
   537D 01                537D 353        DC    XL1'01'          SPACE 1
   537E 28                537E 354        DC    AL1(MENU2E-MENU25) LENGTH
   537F 6B07              5380 355        DC    AL2(MENU2E)      @ OF MESSAGE
   5381 C0 87 021A            356        B     PRINT1           PRINT INSTRUCTION FOR DISK DUMP
   5385 01                5385 357        DC    XL1'01'          SPACE 1
   5386 28                5386 358        DC    AL1(MENU2F-MENU26) LENGTH
   5387 6B2F              5388 359        DC    AL2(MENU2F)      @ OF MESSAGE
   5389 C0 87 021A            360        B     PRINT1           PRINT INSTRUCTION FOR DISK DUMP
   538D 01                538D 361        DC    XL1'01'          SPACE 1
   538E 28                538E 362        DC    AL1(MENU2G-MENU27) LENGTH
   538F 6B57              5390 363        DC    AL2(MENU2G)      @ OF MESSAGE
   5391 C0 87 021A            364        B     PRINT1           PRINT INSTRUCTION FOR DISK DUMP
   5395 03                5395 365        DC    XL1'03'          SPACE 1
   5396 28                5396 366        DC    AL1(MENU2H-MENU28) LENGTH
   5397 6B7F              5398 367        DC    AL2(MENU2H)      @ OF MESSAGE
   5399 38 20 0A0E            368        TBN   U5471-1,X'20'     5471 PRESENT ON SYSTEM
   539D F2 10 64              369        JT    READ2            PICK UP DISK DATA
   53A0 C0 87 021A            370        B     PRINT1           PRINT INFO ON HOW TO USE SW'S
   53A4 01                53A4 371        DC    XL1'01'          SPACE
   53A5 24                53A5 372        DC    AL1(MENU7A-MENU71) LENGTH
   53A6 6DFC              53A7 373        DC    AL2(MENU7A)      @ OF DATA
   53A8 C0 87 021A            374        B     PRINT1           PRINT INFO ON HOW TO USE SW'S
   53AC 01                53AC 375        DC    XL1'01'          SPACE
   53AD 18                53AD 376        DC    AL1(MENU7B-MENU72) LENGTH
   53AE 6E17              53AF 377        DC    AL2(MENU7B)      @ OF DATA
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   53B0 C0 87 021A            378        B     PRINT1          PRINT INFO ON HOW TO USE SW'S
   53B4 06                    379        DC    XL1'06'         SPACE
   53B5 2D                    380        DC    AL1(MENU7C-MENU73)  LENGTH
   53B6 6E44                  381        DC    AL2(MENU7C)     @ OF DATA
   53B8 C0 87 0222            382        B     HALT            WAIT FOR INPUT
   53BC D4E3                  383        DC    XL2'D4E3'
   53BE 30 00 71DF            384        SNS   WORK,X'00'      GET CYL AND HEAD #'S FROM DATA SW'S
   53C2 0C 01 7237 71DF       385        MVC   SAREA-3(2),WORK MOVE IN DATA TO BE UNPACKED
   53C8 C0 87 021A            386        B     PRINT1          PRINT INFO ON HOW TO USE SW'S
   53CC 06                    387        DC    XL1'06'         SPACE
   53CD 2D                    388        DC    AL1(MENU7D-MENU74)  LENGTH
   53CE 6E71                  389        DC    AL2(MENU7D)     @ OF DATA
   53D0 C0 87 0222            390        B     HALT
   53D4 D4E4                  391        DC    XL2'D4E4'
   53D6 30 00 71DF            392        SNS   WORK,X'00'      GET NUMBER OF RECORDS WANTED
   53DA 0C 00 7238 71DE       393        MVC   SAREA-2(1),WORK-1  MOVE IN RECORD #
   53E0 C0 87 021A            394        B     PRINT1          PRINT INFO ON HOW TO USE SW'S
   53E4 06                    395        DC    XL1'06'         SPACE
   53E5 30                    396        DC    AL1(MENU7E-MENU75)  LENGTH
   53E6 6EA1                  397        DC    AL2(MENU7E)     @ OF DATA
   53E8 C0 87 0222            398        B     HALT
   53EC D4E5                  399        DC    XL2'D4E5'
   53EE 30 00 71DF            400        SNS   WORK,X'00'      GET THE # OF RECORDS NEEDED
   53F2 0C 01 723A 71DF       401        MVC   SAREA(2),WORK   SAVE THE # OF RECORDS WANTED
   53F8 C0 87 021E            402        B     UNPACK          NOW UNPACK THE DATA SO
   53FC 05                    403        DC    XL1'05'         THAT THE PROGRAM CAN USE IT
   53FD 723A                  404        DC    AL2(SAREA)      @ OF THE PACKED DATA
   53FF 0A89                  405        DC    AL2(READIN+9)   @ OF THE UNPACKED DATA
   5401 F2 87 44              406        J     FSTDP           PICKUP UP DATA ENTERED
   5404 C0 87 021A            407 READ2  B     PRINT1          PRINT INSTRUCTION FOR DISK DUMP
   5408 06                    408        DC    XL1'06'         SPACE 1
   5409 29                    409        DC    AL1(MENU2I-MENU29)  LENGTH
   540A 6BA8                  410        DC    AL2(MENU2I)     @ OF MESSAGE
   540C C0 87 6210            411        B     RECORD          GO READ IN DATA
   5410 F2 87 35              412        J     FSTDP           JUMP TO PICK UP DATA
   5413 3D F9 0A80            413 CHNXT  CLI   READIN,C'9'     OPTION 9 SELECTED
   5417 C0 81 5081            414        BE    FMENU           IF SO, RETURN TO OPTION MENU
   541B 0C 01 620F 71F1       415        MVC   STRET+3,ADUMP(2)
   5421 3D F3 0A80            416        CLI   READIN,C'3'     'CONT' ENTERED?
   5425 F2 81 14              417        JE    CONT            GO CONTINUE
   5428 C0 87 021A            418        B     PRINT1          PRINT ERROR -- INVALID OPTION
   542C C2                542C 419        DC    XL1'C2'         SPACE 2
   542D 26                542D 420        DC    IL1'38'         LENGTH
   542E 692D              542F 421        DC    AL2(ERR1)       @ OF ERROR MESSAGE
   5430 4487              5431 422        DC    XL2'4487'
   5432 C0 87 0222            423        B     HALT            INDICATE ERROR 87
   5436 4487              5437 424        DC    XL2'4487'
   5438 C0 87 531E            425        B     DDUMP
   543C C0 87 021E            426 CONT   B     UNPACK          UNPACK CURRENT DISK ADDRESS
   5440 03                5440 427        DC    IL1'3'
   5441 7205              5442 428        DC    AL2(PSBYTE)
   5443 71FD              5444 429        DC    AL2(SBYTE)
   5445 F2 87 06              430        J     *+9
   5448 0C 05 71FD 0A85       431 FSTDP  MVC   SBYTE(6),READIN+5
   544E C0 87 6152            432        B     CKSEC           CHECK FOR VALID RECORD NUMBER
   5452 C0 87 55DD            433        B     LOADD           SEARCH TO DISK
   5456 0C 02 555A 5250       434        MVC   SECCNT,DEC1     INIT. RECORD COUNTER
   545C 3D D5 0A87            435        CLI   READIN+7,C'N'   DEFAULT TO ONE RECORD.
   5460 F2 81 2D              436        JE    THRU
   5463 3D 40 0A87            437        CLI   READIN+7,C' '
   5467 F2 81 26              438        JE    THRU
   546A 3D 40 0A89            439        CLI   READIN+9,C' '   CHECK NUMBER
   546E F2 81 09              440        JE    NOT3            OF DIGITS ENTERED
   5471 0C 02 555A 0A89       441        MVC   SECCNT(3),READIN+9  IN 'NNN' FIELD
   5477 F2 87 15              442        J     THRU            AND SET UP COUNTER.
   547A 3D 40 0A88            443 NOT3   CLI   READIN+8,C' '
   547E F2 81 09              444        JE    IS1
   5481 0C 01 555A 0A88       445        MVC   SECCNT(2),READIN+8
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   5487 F2 87 06              446        J     THRU
   548A 0C 00 555A 0A87       447 IS1    MVC   SECCNT(1),READIN+7
   5490 3C 00 5563            448 THRU   MVI   ADRCNT,X'00'     INIT. ADDR. COUNTER
   5494 0D 02 555A 71D7       449        CLC   SECCNT(3),CHAR0  CHECK FOR DEFAULT
   549A F2 01 06              450        JNE   THRU1           DON'T TAKE DEFAULT
   549D 0C 02 555A 5250       451        MVC   SECCNT,DEC1     DEFAULT TO ONE RECORD
   54A3 0C 01 5488 555C       452 THRU1  MVC   PK1,BUF@       SET PRINT LINE SPACE COUNT TO
   54A9 C0 87 021E            453 PAGN   B     UNPACK          BEGINNING OF RECORD AND
   54AD 01                    454        DC    IL1'1'          UNPACK ADDR. LEAVE 2 SPACES.
   54AE 5563                  455        DC    AL2(ADRCNT)
   54B0 5566                  456        DC    AL2(PRTLN+1)
   54B2 C0 87 021E            457        B     UNPACK          UNPACK NEXT 4 BYTES OF CORE
   54B6 04                    458        DC    IL1'4'          AND LEAVE 1 SPACE.
   54B7 0000                  459 PK1    DC    AL2(*-*)
   54B9 5570                  460        DC    AL2(PRTLN+11)
   54BB 0E 01 5488 5562       461        ALC   PK1,HEX4
   54C1 0C 01 54CD 54B8       462        MVC   PK2,PK1
   54C7 C0 87 021E            463        B     UNPACK          UNPACK NEXT 4 BYTES.
   54CB 04                    464        DC    IL1'4'
   54CC 0000                  465 PK2    DC    AL2(*-*)
   54CE 5579                  466        DC    AL2(PRTLN+20)
   54D0 0E 01 5488 5562       467        ALC   PK1,HEX4
   54D6 0C 01 54E2 5488       468        MVC   PK3,PK1
   54DC C0 87 021E            469        B     UNPACK          UNPACK NEXT 4 BYTES.
   54E0 04                    470        DC    IL1'4'
   54E1 0000                  471 PK3    DC    AL2(*-*)
   54E3 5582                  472        DC    AL2(PRTLN+29)
   54E5 0E 01 5488 5562       473        ALC   PK1,HEX4
   54EB 0C 01 54F7 5488       474        MVC   PK4,PK1
   54F1 C0 87 021E            475        B     UNPACK          UNPACK NEXT 4 BYTES AND
   54F5 04                    476        DC    IL1'4'          LEAVE 3 SPACES.
   54F6 0000                  477 PK4    DC    AL2(*-*)
   54F8 558B                  478        DC    AL2(PRTLN+38)
   54FA 0C 01 5509 54B8       479        MVC   PK+5,PK1(2)
   5500 3C 5C 558F            480        MVI   PRTLN+42,C'*'   SET INFO IN CORE INTO
   5504 0C 0F 559F 0000       481 PK     MVC   PRTLN+58,*-*(16)  END OF PRINT LINE
   550A 3C 5C 55A0            482        MVI   PRTLN+59,C'*'   BETWEEN ASTERISKS.
   550E 0E 01 5488 5562       483        ALC   PK1,HEX4        INCREMENT ADDR BY 4 BYTES.
   5514 C0 87 021A            484        B     PRINT           PRINT LINE.
   5518 01                    485        DC    XL1'01'         SPACE ONE.
   5519 3C                    486        DC    IL1'60'         LENGTH OF LINE.
   551A 55A0                  487        DC    AL2(PRTLN+59)   ADDR. OF LAST PRINT CHAR.
   551C 0E 00 5563 5564       488        ALC   ADRCNT,HEX10(1) INCR. ADDR. COUNTER BY HEX 10.
   5522 C0 01 54A9            489        BNZ   PAGN            CHECK FOR END OF RECORD.
   5526 C0 87 021A            490        B     PRINT           PRINT BLANK LINE.
   552A 11                    491        DC    XL1'11'
   5528 07 02 555A 5250       492        SZ    SECCNT,DEC1     CHECK FOR RIGHT # RECORDS PRINTED.
   5531 F2 01 09              493        JNZ   GOLOD          IF SO, GO BACK TO DUMP MENU.
   5534 C0 87 021A            494        B     PRINT           SPACE SIX
   5538 16                    495        DC    XL1'16'
   5539 C0 87 531E            496        B     DDUMP
   553D 0C 01 620F 71F1       497 GOLOD  MVC   STRET+3(2),ADUMP  CHECK NEXT RECORD FOR CORRECT
   5543 C0 87 021E            498        B     UNPACK          UNPACK NEW DISK ADDRESS
   5547 03                    499        DC    IL1'3'
   5548 7205                  500        DC    AL2(PSBYTE)
   554A 71FD                  501        DC    AL2(SBYTE)
   554C C0 87 6152            502        B     CKSEC
   5550 C0 87 55DD            503        B     LOADD           READ NEXT RECORD.
   5554 C0 87 5490            504        B     THRU            PRINT IT.
   5558 F0F0F1                505 SECCNT DC    DL3'001'        RECORD COUNTER
   555B 0003                  506 BUF@   DC    AL2(BUFFER+3)   @EGINNING OF RECORD
   555D C3D6D5E3              507 CCONT  DC    CL4'CONT'       'CONT' OPTION
   5561 0004                  508 HEX4   DC    XL2'0004'       USED TO INCREMENT 4 BYTES
   5563 00                    509 ADRCNT DC    XL1'00'         ADDRESS COUNTER
   5564 10                    510 HEX10  DC    XL1'10'         USED TO INCREMENT ADDR COUNTER
                              511 PRTLN  EQU   *
   5565 4040404040404040 55DC 512        DC    CL120' '
   556D 4040404040404040      512
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   5575 4040404040404040       512
   557D 4040404040404040       512
   5585 4040404040404040       512
   558D 4040404040404040       512
   5595 4040404040404040       512
   559D 4040404040404040       512
   55A5 4040404040404040       512
   55AD 4040404040404040       512
   55B5 4040404040404040       512
   55BD 4040404040404040       512
   55C5 4040404040404040       512
   55CD 4040404040404040       512
   55D5 4040404040404040       512
                               513 *
                               514 *
                               515 *       THIS SUBROUTINE WILL READ ONE RECORD AND THEN
                               516 *       PRINT A HEADING FOR EACH RECORD BEING DUMPED.
                               517 *
                               518 *
   55DD 34 08 5637             519 LOADD  ST    ELOD+3,ARR          SAVE FOR RETURNING
   55E1 0C 04 646E 7202        520        MVC   DDCFM(5),DSKFLD+4   SET UP DISK CONTROL FIELD
   55E7 3C 00 6472             521        MVI   DDCF,0              TO READ 1 RECORD
                               522
   55EB C0 87 6475             523        B     WINRW               READ A RECORD
   55EF 80              55EF   524        DC    XL1'80'             READ FLAG
   55F0 0C00            55F1   525        DC    AL2(BUFFER)
   55F2 6469            55F3   526        DC    AL2(DDCF8)
                               527
   55F4 3D FF 71ED             528        CLI   NPRT,X'FF'          SHOULD PRINTING OF TITLE BE BYPASSED
   55F8 3C 00 71ED             529        MVI   NPRT,0
   55FC F2 81 23               530        JE    STPFLE
   55FF C0 87 021E             531        B     UNPACK              UNPACK CYLINDER VALUE
   5603 01              5603   532        DC    IL1'1'
   5604 71FF            5605   533        DC    AL2(DSKFLD+1)
   5606 7482            5607   534        DC    AL2(MSGCY1)
   5608 C0 87 021E             535        B     UNPACK              UNPACK HEAD   VALUE
   560C 01              560C   536        DC    IL1'1'
   560D 7201            560E   537        DC    AL2(DSKFLD+3)
   560F 748C            5610   538        DC    AL2(MSGCY2)
   5611 C0 87 021E             539        B     UNPACK              UNPACK RECORD VALUE
   5615 01              5615   540        DC    IL1'1'
   5616 7202            5617   541        DC    AL2(DSKFLD+4)
   5618 7497            5619   542        DC    AL2(MSGCYL)
   561A C0 87 021A             543        B     PRINT               PRINT HEADING
   561E 01              561E   544        DC    XL1'01'
   561F 20              561F   545        DC    AL1(MSGCYL-MSGCYB)
   5620 7497            5621   546        DC    AL2(MSGCYL)
   5622 C0 87 6284             547 STPFLE B     STPFLD              INCREMENT DISK CONTROL FIELD
   5626 7202            5627   548        DC    AL2(DSKFLD+4)       ADDRESS OF RIGHT MOST BYTE
   5628 0C 00 7203 71FF        549        MVC   PSBYTE-2(1),DSKFLD+1 UPDATE PACKED CONTROL FIELD
   562E 0C 01 7205 7202        550        MVC   PSBYTE(2),DSKFLD+4
   5634 C0 87 0000             551 ELOD   B     *-*                 RETURN
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               553 ************************************************************
                               554 * DPUNCH *                                                 *
                               555 **********                                                 *
                               556 *            THIS SUBROUTINE WILL ALLOW ANY PROGRAM       *
                               557 *            RESIDING ON THE CE PACK TO BE DUMPED IN      *
                               558 *            CARD FORMAT, EXCEPT THE CPU & MEMORY,        *
                               559 *            FFA, FFB, AND DCP PROGRAMS.                  *
                               560 ************************************************************
                               561
                          5638 562 DPUNCH EQU   *
   5638 C0 87 021A             563        B     PRINT1              DISPLAY OPTION MENU
   563C 01                563C 564        DC    XL1'01'
   563D 39                563D 565        DC    AL1(MENU5A-MENU5)
   563E 6C5E              563F 566        DC    AL2(MENU5A)
   5640 C0 87 021A             567        B     PRINT1              DISPLAY OPTION MENU
   5644 01                5644 568        DC    XL1'01'
   5645 23                5645 569        DC    AL1(MENU5B-MENU52)
   5646 6C81              5647 570        DC    AL2(MENU5B)
   5648 C0 87 021A             571        B     PRINT1              DISPLAY OPTION MENU
   564C 01                564C 572        DC    XL1'01'
   564D 17                564D 573        DC    AL1(MENU5C-MENU53)
   564E 6C98              564F 574        DC    AL2(MENU5C)
   5650 C0 87 021A             575        B     PRINT1              DISPLAY OPTION MENU
   5654 06                5654 576        DC    XL1'06'
   5655 17                5655 577        DC    AL1(MENU5D-MENU54)
   5656 6CAF              5657 578        DC    AL2(MENU5D)
   5658 38 20 0A0E             579 CHKOP  TBN   U5471-1,X'20'       5471 PRESENT ON SYSTEM
   565C F2 10 19               580        JT    GO3                 YES,READ DATA FROM 5471
   565F C0 87 0222             581        B     HALT                WAIT FOR OPTION
   5663 D4E1              5664 582        DC    XL2'D4E1'
   5665 30 00 71DF             583        SNS   WORK,X'00'          NO,READ DATA IN FROM CPU SW'S
   5669 0C 00 0A80 71DF        584        MVC   READIN(1),WORK      MOVE IN SELECTED OPTION
   566F 08 00 0A80 510C        585        MZZ   READIN,F0           CONVERT TO CHARACTER
   5675 F2 87 04               586        J     GO4                 BYPASS READ FROM 5471
   5678 C0 87 6210             587 GO3    B     RECORD              READ FROM 5471
   567C 3D F1 0A80             588 GO4    CLI   READIN,C'1'         OPT 1 SELECTED
   5680 F2 81 1C               589        JE    GO2                 YES,CONTINUE
   5683 3D F9 0A80             590        CLI   READIN,C'9'         TERMINATE OPTION
   5687 C0 81 5081             591        BE    FMENU               GO TO MAIN MENUE
   568B C0 87 021A             592        B     PRINT1              PRINT ERROR IF VALID OPTION
   568F C6                568F 593        DC    XL1'C6'             NOT ENTERED
   5690 26                5690 594        DC    IL1'38'
   5691 692D              5692 595        DC    AL2(ERR1)
   5693 D4B7              5694 596        DC    XL2'D4B7'
   5695 C0 87 0222             597        B     HALT                DISPLAY HALT B7 ON STIK LITE
   5699 D4B7              569A 598        DC    XL2'D4B7'
   569B C0 87 5658             599        B     CHKOP               CHECK OPTION AGAIN
   569F C0 87 021A             600 GO2    B     PRINT1              DISPLAY OPTION MENU
   56A3 06                56A3 601        DC    XL1'06'
   56A4 19                56A4 602        DC    AL1(MENU5E-MENU51)
   56A5 6CC8              56A6 603        DC    AL2(MENU5E)
   56A7 38 20 0A0E             604        TBN   U5471-1,X'20'
   56AB F2 10 1E               605        JT    GO1                 GET INPUT
   56AE C0 87 021A             606        B     PRINT               PRINT MSG
   56B2 06                56B2 607        DC    XL1'06'             SPACE
   56B3 43                56B3 608        DC    AL1(MENU5F-MENU56)  LENGTH
   56B4 6D0B              56B5 609        DC    AL2(MENU5F)         MSG @
   56B6 C0 87 0222             610        B     HALT                WAIT FOR PROG ID
   56BA 00E2              56B8 611        DC    XL2'E2'
   56BC 30 00 71DF             612        SNS   WORK,X'00'          SENSE PROG ID FROM
   56C0 C0 87 021E             613        B     UNPACK              UNPACK
   56C4 03                56C4 614        DC    XL1'03'             PACKED LENGTH
   56C5 71DF              56C6 615        DC    AL2(WORK)           PACKED DATA @
   56C7 0A82              56C8 616        DC    AL2(READIN+2)       UNPACKED DATA @
   56C9 F2 87 04               617        J     GO5
   56CC C0 87 6210             618 GO1    B     RECORD              WAIT FOR INPUT
   56D0 C0 87 5E61             619 GO5    B     SETCRD              ALLOW SELECTION OF CARD DEVICE
   56D4 0C 02 52C5 0A82        620        MVC   PID(3),READIN+2     SAVE PROGRAM ID
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   56DA 0C 02 56F3 0A82       621         MVC   PRGID1(3),READIN+2  SET SCAN PARAMETER FOR SUBRT
   56E0 0C 02 74B8 0A82       622         MVC   MSGBAD-12(3),READIN+2 SAVE ID FOR ERROR MESSAGE
   56E6 0C 03 720B 701F       623         MVC   CARDNO(4),FOF1      INITIALIZE 80 COL CARD COUNTER
                              624
   56EC C0 87 6310            625         B     SCNVTC              SCAN VTOC FOR PROGRAM
   56F0 00                56F0 626 FLG1    DC    IL1'0'              SUBROUTINE
   56F1 404040            56F3 627 PRGID1  DC    CL3' '                        PARAMETERS
                              628
   56F4 C2 01 0880            629         LA    INPUT,XR1           USE XR1 FOR DISK DATA FIELD
   56F8 3D 0F 56F0            630         CLI   FLG1,X'0F'          PROGRAM FOUND?
   56FC F2 81 14              631         JE    STINF               IF YES, TAKE THE JUMP
                              632
   56FF C0 87 021A            633         B     PRINT               PRINT ERROR IF ENTRY NEVER FOUND
   5703 C6                5703 634         DC    XL1'C6'
   5704 0F                5704 635         DC    IL1'15'
   5705 74C7              5706 636         DC    AL2(MSGBAD)
   5707 D445              5708 637         DC    XL2'D445'
   5709 C0 87 0222            638         B     HALT                ERROR
   570D D445              570E 639         DC    XL2'D445'            * 45 ****************************
   570F C0 87 5638            640         B     DPUNCH
                              641
                          5713 642 STINF   EQU   *
   5713 0C 04 7202 0C0E       643         MVC   DSKFLD+4(5),BUFFER+14 SAVE CYLINDER/HEAD/RECORD WHERE
                              644 *                                  PROGRAM RESIDES
   5719 0C 01 7021 0C15       645         MVC   SECNT(2),BUFFER+21  SAVE PROGRAM SIZE (IM RECORDS)
                              646
   571F 3C FF 71ED            647         MVI   NPRT,X'FF'          BYPASS PRINTING TITLE
   5723 C0 87 55DD            648         B     LOADD               GO READ FIRST RECORD
   5727 4C 5F 5F 0C5F         649         MVC   95(96,XR1),BUFFER+95 PUT INFO IN PUNCH BUFFER
   572C 1C 07 7029 5F         650         MVC   SEQNO(8),95(,XR1)
   5731 3C 00 729C            651         MVI   PFLAG,X'00'         RESET PROG DATA DECK FLAG
   5735 4D 03 03 5889         652         CLC   3(4,XR1),DTAHDR     IS IT A DATA DECK?
   573A F2 01 0E              653         JNE   CKM                 IF NOT DON'T TURN ON FLAG
   573D 3A 0F 729D            654         SBN   DFLAG,X'0F'         SET FOR DATA DECK
   5741 7D D7 52              655         CLI   82(,XR1),C'P'       IS THIS A PROG DATA DECK?
   5744 F2 01 04              656         JNE   CKM                   NO, JUMP
   5747 3C FF 729C            657         MVI   PFLAG,X'FF'         SET PROG DATA DECK FLAG
   5748 7D D4 00          574E 658 CKM     CLI   0(,XR1),C'M'        IS IT A TAP DECK?
   574E F2 01 04              659         JNE   *+7                 SKIP IF NOT
   5751 3A F0 729D            660         SBN   DFLAG,X'F0'
   5755 3C FF 7221            661         MVI   FLAGC,X'FF'         INDICATE 80 COL. NEEDS 2 FOR 1
   5759 C0 87 5F5D            662         B     PNCH80              PUNCH HEADER CARD
   575D 3D 00 729D            663         CLI   DFLAG,0             IF IT IS A DATA DECK DON'T
   5761 F2 01 09              664         JNE   LOOP4                  SUBTRACT THE FIRST TIME
   5764 0F 01 7021 7015       665         SLC   SECNT(2),ONE        DECREMENT # OF RECORDS LEFT TO PUNCH
   576A F2 81 61              666         JZ    ENDRT               QUIT IF NO RECORDS LEFT TO PUNCH
                              667
   576D 3C FF 71ED        5771 668 LOOP4   MVI   NPRT,X'FF'         DON'T PRINT
   5771 C0 87 55DD            669         B     LOADD               READ NEXT RECORD
   5775 4C 57 57 0C57         670         MVC   87(88,XR1),BUFFER+87 PUT INFO IN PUNCH BUFFER
   577A 06 30 7029 5250       671         AZ    SEQNO(4),DEC1(1)    INCREMENT SEQ #
   5780 4C 07 5F 7029         672         MVC   95(8,XR1),SEQNO
   5785 0F 01 7021 7015       673         SLC   SECNT(2),ONE        DECREMENT CARD COUNTER
   578B F2 81 40              674         JZ    ENDRT
   578E 7D 5C 00              675         CLI   0(,XR1),C'*'        IS IT A COMMENT RECORD?
   5791 F2 81 2E              676         JE    PNCHCD              JUMP IF IT ISN'T
   5794 38 F0 722B            677         TBN   CRDFLG,X'F0'        IS THE MFCU THE CARD DEVICE?
   5798 F2 10 15              678         JT    IS96
   579B 3D 00 729D            679         CLI   DFLAG,0             SKIP IF NIETHER DATA OR TAP DECK
   579F F2 81 07              680         JE    *+10
   57A2 5D 07 4F 5F           681         CLC   79(8,XR1),95(,XR1)  WAS IT IN COMPRESSED FORM?
   57A6 F2 01 19              682         JNE   PNCHCD              IF NOT, THEN SKIP
   57A9 5C 07 4F 5F           683         MVC   79(8,XR1),95(,XR1)  MOVE SEQ # AND ID FIELDS INTO 80
                              684 *                                COL FORMAT
   57AD F2 87 16              685         J     PNCHCD+4            GO PUNCH THE CARD
   57B0 3D 00 729D        57B4 686 IS96    CLI   DFLAG,0             IF  NOT  A DATA DECK, THEN
   57B4 F2 81 07              687         JE    NOTDAT                 JUMP
   57B7 3D FF 729C            688         CLI   PFLAG,X'FF'         IS IT PROG DATA DECK?
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   57B8 F2 01 04              689         JNE   PNCHCD                NO, DON'T CNVRT.
   57BE C0 87 57F2            690 NOTDAT  B     CNVRT               CONVERT DATA INTO UNCOMPRESSED
                              691 *                                   FORMAT
   57C2 3C FF 7221            692 PNCHCD  MVI   FLAGC,X'FF'         INDICATE 80 COL. NEEDS 2 FOR 1
   57C6 C0 87 5F5D            693         B     PNCH80              PUNCH CARD
   57CA C0 87 576D            694         B     LOOP4               READ ANOTHER RECORD
                              695
   57CE 3D 00 729D            696 ENDRT   CLI   DFLAG,0             IF IT IS A TAP OR DATA DECK, THEN
   57D2 3C 00 729D            697         MVI   DFLAG,0             RETURN TO MAIN OPTION MENU
   57D6 C0 01 5638            698         BNE   DPUNCH
                              699
   57DA 7C 40 57              700         MVI   87(,XR1),C' '       BLANK OUT END CARD FIELD
   57DD 5C 55 56 57           701         MVC   86(86,XR1),87(,XR1)
   57E1 4C 22 3D 7561         702         MVC   61(35,XR1),MSGDCK   PUT IN END CARD MESSAGE
   57E6 3C FF 7221            703         MVI   FLAGC,X'FF'         INDICATE 2 FOR 1 NEEDED
   57EA C0 87 5F5D            704         B     PNCH80
   57EE C0 87 5638            705         B     DPUNCH
                              706 *
                              707 *       CONVERT COMPRESSED FORMAT DISK RECORD INTO UNCOMPRESSED
                              708 *       FORMAT CARD RECORD
                              709 *
   57F2 3C 1D 7013            710 CNVRT   MVI   COUNT,29
   57F6 34 08 5885            711         ST    CNVRTR+3,ARR        SAVE RETURN ADDRESS
   57FA 0C 07 7029 08DF       712         MVC   SEQNO(8),INPUT+95   SAVE SEQUENCE NUMBER
   5800 3C 40 1048            713         MVI   BUFFER+1096,X'40'   CLEAR FIELD
   5804 0C 5F 1047 1048       714         MVC   BUFFER+1095(96),BUFFER+1096
   580A C2 01 0881            715         LA    INPUT+1,XR1         INPUT FIELD IS 63 BYTES LONG
   580E C2 02 0FE8            716         LA    BUFFER+1000,XR2     OUTPUT FIELD IS 84 BYTES LONG
   5812 9C 03 03 02           717 NOTDON  MVC   3(4,XR2),2(,XR1)    GET FIRST 3 BYTES
   5816 BC 00 00              718         MVI   0(,XR2),X'00'       CLEAR LOW ORDER BYTE
   5819 3C J6 702C            719         MVI   COUNTR,X'06'        FIRST BYTES ADDED TOGETHER 6 TIMES
   581D AE 03 03 03           720 FX1     ALC   3(4,XR2),3(,XR2)    SHIFT LEFT 6 POSITIONS
   5821 0F 00 702C 7015       721         SLC   COUNTR(1),ONE
   5827 C0 01 581D            722         BNZ   FX1
   582B BB C0 00              723         SBF   0(,XR2),X'C0'       SET BITS 0 AND 1 OFF
   582E 3C 04 702C            724         MVI   COUNTR,X'04'        SECOND BYTES ADDED TOGETHER 4 TIMES
   5832 9C 02 03 02           725         MVC   3(3,XR2),2(,XR1)
   5836 AE 02 03 03           726 FX2     ALC   3(3,XR2),3(,XR2)    SHIFT LEFT 4 POSITIONS
   583A 0F 00 702C 7015       727         SLC   COUNTR(1),ONE
   5840 C0 01 5836            728         BNZ   FX2
   5844 BB C0 01              729         SBF   1(,XR2),X'C0'
   5847 3C 02 702C            730         MVI   COUNTR,X'02'        BYTES ADDED TOGETHER 2 TIMES
   584B 9C 01 03 02           731         MVC   3(2,XR2),2(,XR1)
   584F AE 01 03 03           732 FX3     ALC   3(2,XR2),3(,XR2)    SHIFT LEFT 2 POSITIONS
   5853 0F 00 702C 7015       733         SLC   COUNTR(1),ONE
   5859 C0 01 584F            734         BNZ   FX3
   585D BB C0 02              735         SBF   2(,XR2),X'C0'
   5860 9C 00 03 02           736         MVC   3(1,XR2),2(,XR1)    ON LAST BYTE, JUST TURN
   5864 BB C0 03              737         SBF   3(,XR2),X'C0'        BITS 0 AND 1 OFF
                              738
   5867 D2 01 03              739         LA    3(,XR1),XR1         CONTINUE THIS FOR ALL BYTES ON CARD
   586A E2 02 04              740         LA    4(,XR2),XR2
   586D 0F 00 7013 7015       741         SLC   COUNT(1),ONE        DO THIS 21 TIMES PER CARD
   5873 C0 01 5812            742         BNZ   NOTDON
   5877 8C 02 57 729A         743         MVC   87(3,XR2),BLANK     CLEAR CHECK FIELD
                              744
                              745 *       NOW CONVERT DATA TO PRINTABLE VIA DIRECT TABLE LOOKUP
                              746 *
   587C 3C 58 7013            747         MVI   COUNT,88
   5880 C2 01 760C            748         LA    TABLE,XR1           XR1 POINTS TO VALUES IN TABLE
   5884 C2 02 0FE8            749         LA    BUFFER+1000,XR2
   5888 2C 00 5890 00         750 KPMVC   MVC   MVC+3(1),0(,XR2)     SETUP TO TRANSLATE
   588D 9C 00 00 00           751 MVC     MVC   0(1,XR2),*-*(,XR1)  TRANSLATE EACH BYTE
   5891 E2 02 01              752         LA    1(,XR2),XR2
   5894 0F 00 7013 7015       753         SLC   COUNT(1),ONE
   589A C0 01 5888            754         BNZ   KPMVC
                              755
   589E C2 01 0880            756         LA    INPUT,XR1           NOW FIX UP CARD FOR PUNCHING
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   58A2 C2 02 0FE8            757         LA    BUFFER+1000,XR2
   58A6 7C E3 00              758         MVI   0(,XR1),C'T'
   58A9 6C 53 54 53           759         MVC   84(84,XR1),83(,XR2)   SETUP TEXT DATA
   58AD 4C 07 5F 7029         760         MVC   95(8,XR1),SEQNO       PUT IN SEQUENCE NUMBER
   58B2 C0 87 0000            761 CNVRTR  B     *-*                   RETURN TO CALLER
   58B6 F06B6B40        58B9  762 DTAHDR  DC    CL4'0,, '
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                            764 ************************************************************
                            765 *   'DUP' ROUTINE                                          *
                            766 *                                                          *
                            767 *       THE FOLLOWING WILL 'DUP' 80 COLUMN                 *
                            768 *       DECKS FROM THE 1442. IF THE 1442 IS NOT            *
                            769 *       DEFINED VIA THE UDT, THE FOLLOWING SSW'S           *
                            770 *       MAYBE SET:                                         *
                            771 *                                                          *
                            772 *       SSW 18 = 1442 AS INPUT/OUTPUT DEVICE               *
                            773 *       NO SETTING= WHATEVER DEFINED IN THE UDT            *
                            774 ************************************************************
                            775
                            775
                      58BA  776 DUP     EQU   *
   58BA C0 87 5E61          777         B     SETCRD                ALLOW SELECTION OF A CARD DEVICE
   58BE 3D F0 7228          778         CLI   CRDFLG,MFCU           IF MFCU SELECTED,TELL TO USE 'DUP'
   58C2 C0 01 58DA          779         BNE   GORD80
   58C6 C0 87 021A          780         B     PRINT
   58CA C6                  781         DC    XL1'C6'
   58CB 28                  782         DC    IL1'40'
   58CC 73E8                783         DC    AL2(MSGDUP)
   58CE D442                784         DC    XL2'D442'
   58D0 C0 87 0222          785         B     HALT                  HALT
   58D4 D442                786         DC    XL2'D442'              * 42 **************************
   58D6 C0 87 5081          787         B     FMENU
   58DA C0 87 5EE5          788 GORD80  B     READ80                READ THE FIRST RECORD
   58DE 35 02 722D          789         L     READBF,XR2
   58E2 8D 05 05 7395       790         CLC   5(6,XR2),MSGPUN       CHECK FOR $PUNCH CONTROL RECORD
   58E7 F2 81 14            791         JE    SETUP
   58EA C0 87 021A          792         B     PRINT                 9PRINT
   58EE C6                  793         DC    XL1'C6'                MISSING CONTROL CARD
   58EF 27                  794         DC    IL1'39'
   58F0 73C0                795         DC    AL2(MSGCNT)
   58F2 D440                796         DC    XL2'D440'
   58F4 C0 87 0222          797         B     HALT                  HALT
   58F8 D440                798         DC    XL2'D440'              * 40 ******************************
   58FA C0 87 588A          799         B     DUP
   58FE C2 01 0C00          800 SETUP   LA    BUFFER,XR1            USE XR1 FOR BUFFER CARDS READINTO
   5902 0C 01 702C 7017     801         MVC   COUNTR(2),ZERO        CLEAR CARD COUNTER
   5908 3C 00 702A          802         MVI   EFLAG,0               CLEAR END CARD FLAG
   590C C0 87 5EE5          803 RD80    B     READ80                READ FIRST DECK CARD
   5910 35 02 722D          804         L     READBF,XR2
   5914 8D 03 03 7399       805         CLC   3(4,XR2),MSGEND       WAS $END CONTROL CARD READ?
   5919 F2 01 07            806         JNE   NOTEND                NO
   591C 3C FF 702A          807         MVI   EFLAG,X'FF'           INDICATE LAST CARD READ
   5920 F2 87 17            808         J     DOPNCH                GO PUNCH DECK
   5923 6C 4F 4F 4F         809 NOTEND  MVC   79(80,XR1),79(,XR2)    SAVE CARD CONTENTS
   5927 D2 01 50            810         LA    80(,XR1),XR1          INCREMENT BUFFER COUNTER
   592A 0E 01 702C 7015     811         ALC   COUNTR(2),ONE         INCREMENT CARD COUNTER
   5930 0D 01 702C 71E6     812         CLC   COUNTR(2),TWO00       ALLOW 100 CARDS FOR ONE PASS
   5936 C0 01 590C          813         BNE   RD80
                            814
   593A 0D 01 702C 7017     815 DOPNCH  CLC   COUNTR(2),ZERO        HAVE ALL CARDS BEEN PUNCHED?
   5940 C0 81 5081          816         BE    FMENU
   5944 C2 01 0C00          817         LA    BUFFER,XR1
   5948 1C 4F 08CF 4F       818 PCHAGN  MVC   INPUT+79(80),79(,XR1) SETUP PUNCH FIELD
   594D C0 87 5F5D          819         B     PNCH80                GO PUNCH THE CARD
   5951 D2 01 50            820         LA    80(,XR1),XR1          INCREMENT BUFFER COUNTER
   5954 0F 01 702C 7015     821         SLC   COUNTR(2),ONE         DECREMENT CARD COUNTER
   595A C0 01 5948          822         BNZ   PCHAGN
   595E 3D FF 702A          823         CLI   EFLAG,X'FF'           HAS $END CONTROL CARD BEEN READ?
   5962 C0 01 58FE          824         BNE   SETUP
   5966 C0 87 5081          825         B     FMENU
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              827 ************************************************************************
                              828 *                                                                      *
                              829 *       PUNCH SUBROUTINE                                               *
                              830 *                                                                      *
                              831 *       THIS SUBROUTINE ALLOWS THE PRINTER/KEYBOARD TO BE              *
                              832 *       USED AS A KEYPUNCH WITH THE CARDS PUNCHED ON THE               *
                              833 *       5424 OR 1442.                                                  *
                              834 *                                                                      *
                              835 ************************************************************************
                              836
                        596A  837 PUNCH  EQU   *
596A 38 20 0A0E               838       TBN   U5471-1,X'20'        IF THE 5471 IS NOT ON THIS
                              839       JT    PUNCH1               SYSTEM THEN DO NOT ALLOW THE
                              840       B     PRINT1               KEYPUNCH FUNCTION.
                        5975  841       DC    XL1'06'              PRINT ERROR TO THE OPERATOR.
                        5976  842       DC    IL1'46'              MESSAGE LENGTH
                        5978  843       DC    AL2(ER5471)          MESSAGE ADDRESS
                              844       B     FMENU                RETURN TO MAIN MENUE
                              845 PUNCH1 B    PRINT1                DISPLAY
                        5981  846       DC    XL1'06'                INFORMATIONAL
                        5982  847       DC    IL1'27'
                        5984  848       DC    AL2(MSGENT)
                              849       MVI   PUNFLG,X'FF'         PRINT 80 INSTEAD OF 8 INPUT BYTES
                              850       B     RECORD               GO READ THE INPUT
                              851       B     SETCRD               ALLOW SELECTION OF CARD DEVICE
                              852       MVC   INPUT+95(96),READIN+95  SETUP FOR PUNCHING A CARD
                              853       B     PNCH80               PUNCH THE CARD
                              854       CLC   CEND(2),READIN+1     /& TERMINATES
                              855       BE    FMENU
                              856       B     PUNCH                CONTINUE
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              858 ************************************************************************
                              859 *                                                                      *
                              860 *       DISK PATCH                                                     *
                              861 *                                                                      *
                              862 *       THIS SUBROUTINE ALLOWS DISPLAYING A PARTICULAR                 *
                              863 *       RECORD ON THE PRINT DEVICE AND THEN ALLOWS THE                 *
                              864 *       CE TO ALTER THIS RECORD BY ENTERING THE LINE #                 *
                              865 *       AND TYPING IN THE NEW DATA OR IF THE 5471 IS NOT               *
                              866 *       ON THE SYSTEM TO ENTER THE LINE # THRU THE CPU                 *
                              867 *       DATA SWITCHES, FOLLOWED BY THE NEW DATA . IF THE               *
                              868 *       5471 IS USED THEN TYPE IN 'WRITE' TO MODIFY THE                *
                              869 *       DISK. IF THE DATA SWITCHES ARE USED THEN ENTER                 *
                              870 *       'OFFF' AND THIS WILL CAUSE THE DISK TO BE MODIFIED.            *
                              871 *                                                                      *
                              872 ************************************************************************
                              873
                        59A9  874 DPATCH EQU   *
59A9 3C 00 7206               875       MVI   SFLG2,0
59AD 3C 00 7207               876       MVI   SECFLG,0
                              877 *
                              878 *       STORAGE MAP OF BUFFERS IS AS FOLLOWS:
                              879 *
                              880 *       BUFFER - BUFFER+255          PACKED DISK CONTENTS
                              881 *       BUFFER+511 - BUFFER+1023     UNPACKED DISK CONTENTS
                              882 *
                              883       MVI   BUFFER+255,X'40'       CLEAR BUFFERS
                              884       MVI   BUFFER+511,X'40'
59B1 3C 40 0CFF               885       MVC   BUFFER+254(255),BUFFER+255
59B5 3C 40 0DFF               886       MVC   BUFFER+510(255),BUFFER+511
59B9 0C FE 0CFE 0CFF          887       MVC   BUFFER+1023(256),BUFFER+511
59BF 0C FE 0DFE 0DFF          888 XX11  B     PRINT1                 DISPLAY OPTION MENU
59C5 0C FF 0FFF 0DFF    59CF  889       DC    XL1'01'
59CB C0 87 021A         59D0  890       DC    AL1(MENU4A-MENU41)
59CF 01                 59D2  891       DC    AL2(MENU4A)
59D0 29                       892       B     PRINT1
59D1 68F9               59D7  893       DC    XL1'01'                DISPLAY OPTION MENU
59D3 C0 87 021A         59D8  894       DC    AL1(MENU4B-MENU42)
59D7 01                 59DA  895       DC    AL2(MENU4B)
59D8 15                       896       B     PRINT1
59D9 6C0E               59DF  897       DC    XL1'06'
59DB C0 87 021A         59E0  898       DC    AL1(MENU4C-MENU43)
59DF 06                 59E2  899       DC    AL2(MENU4C)
59E0 17                       900 XX14  TBN   U5471-1,X'20'        TEST FOR 5471 ON THE SYSTEM
59E1 6C25                     901       JT    XX12                 YES,GET RESPONSE FROM 5471
59E3 38 20 0A0E               902       B     PRINT                PRINT MSG FOR INPUTTING FROM CPU SW
59E7 F2 10 21           59EE  903       DC    XL1'06'              SPACE
59EA C0 87 021A         59EF  904       DC    IL1'70'              LENGTH
59EE 06                 59F1  905       DC    AL2(MENU70)          MSG @
59EF 46                       906       B     HALT                 HALT 'E1'
59F0 6DD8               59F7  907       DC    XL2'D4E1'
59F2 C0 87 0222               908       SNS   WORK,X'00'           READ CPU SW
59F6 D4E1                     909       MVC   READIN(1),WORK       MOVE INTO READ IN AREA
59F8 30 00 71DF               910       MZZ   READIN,F0            CONVERT TO UNPACK
59FC 0C 00 0A80 71DF          911       J     XX13                 JUMP TO DIAGNOSE
5A02 08 00 0A80 510C          912 XX12  B     RECORD               WAIT FOR INPUT
5A08 F2 87 04                 913 XX13  CLI   READIN,C'9'          RETURN TO MAIN MENUE
5A0B C0 87 6210               914       BE    FMENU
5A0F 3D F9 0A80               915       CLI   READIN,C'1'
5A13 C0 81 5081               916       BE    OPT11
5A17 3D F1 0A80               917       B     PRINT1
5A1B C0 81 5A33         5A23  918       DC    XL1'C6'
5A1F C0 87 021A         5A24  919       DC    IL1'38'
5A23 C6                 5A26  920       DC    AL2(ERR1)
5A24 26                 5A28  921       DC    XL2'44B7'
5A25 692D                     922       B     HALT                 RETURN TO RE-ENTER OPTION
5A27 44B7               5A2E  923       DC    XL2'44B7'            TEST FOR 5471 ON SYSTEM
5A29 C0 87 0222               924       B     XX14
5A2D 44B7                     925 OPT11 TBN   U5471-1,X'20'
5A2F C0 87 59E3
5A33 38 20 0A0E
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   5A37 F2 10 64              926        JT    OPT12                YES,INPUT FROM 5471
   5A3A C0 87 021A            927        B     PRINT1               PRINT INSTRUCTION FOR DISK DUMP
   5A3E 01              5A3E  928        DC    XL1'01'              SPACE 1
   5A3F 28              5A3F  929        DC    AL1(MENU2E-MENU25)   LENGTH
   5A40 6B07            5A41  930        DC    AL2(MENU2E)          @ OF MESSAGE
   5A42 C0 87 021A            931        B     PRINT1               PRINT INSTRUCTION FOR DISK DUMP
   5A46 01              5A46  932        DC    XL1'01'              SPACE 1
   5A47 28              5A47  933        DC    AL1(MENU2F-MENU26)   LENGTH
   5A48 6B2F            5A49  934        DC    AL2(MENU2F)          @ OF MESSAGE
   5A4A C0 87 021A            935        B     PRINT1               PRINT INSTRUCTION FOR DISK DUMP
   5A4E 03              5A4E  936        DC    XL1'03'              SPACE 1
   5A4F 28              5A4F  937        DC    AL1(MENU2G-MENU27)   LENGTH
   5A50 6B57            5A51  938        DC    AL2(MENU2G)          @ OF MESSAGE
   5A52 C0 87 021A            939        B     PRINT                PRINT MENUE
   5A56 01              5A56  940        DC    XL1'01'
   5A57 24              5A57  941        DC    AL1(MENU7A-MENU71)   MSG LENGTH
   5A58 6DFC            5A59  942        DC    AL2(MENU7A)          MSG @
   5A5A C0 87 021A            943        B     PRINT                PRINT MENUE
   5A5E 01              5A5E  944        DC    XL1'01'
   5A5F 1B              5A5F  945        DC    AL1(MENU7B-MENU72)   MSG LENGTH
   5A60 6E17            5A61  946        DC    AL2(MENU7B)          MSG @
   5A62 C0 87 021A            947        B     PRINT                PRINT MENUE
   5A66 06              5A66  948        DC    XL1'06'
   5A67 2D              5A67  949        DC    AL1(MENU7C-MENU73)   MSG LENGTH
   5A68 6E44            5A69  950        DC    AL2(MENU7C)          MSG @
   5A6A C0 87 0222            951        B     HALT
   5A6E D4E3            5A6F  952        DC    XL2'D4E3'            HALT 'E1' DISPLAY
   5A70 30 00 71DF            953        SNS   WORK,X'00'           SENSE DATA SWITCHES
   5A74 0C 01 72AB 71DF       954        MVC   WORK1-1(2),WORK      SAVE DATA
   5A7A C0 87 021A            955        B     PRINT                PRINT
   5A7E 06              5A7E  956        DC    XL1'06'
   5A7F 2D              5A7F  957        DC    AL1(MENU7D-MENU74)   MSG LENGTH
   5A80 6E71            5A81  958        DC    AL2(MENU7D)          MSG @
   5A82 C0 87 0222            959        B     HALT
   5A86 D4E4            5A87  960        DC    XL2'D4E4'            HALT 'E1'
   5A88 30 00 71DF            961        SNS   WORK,X'00'           SENSE DATA SWITCHES
   5A8C 0C 00 72AC 71DE       962        MVC   WORK1(1),WORK-1      MOVE IN DATA FROM SWS 1 + 2
   5A92 C0 87 021E            963        B     UNPACK               UNPACK DATA
   5A96 03              5A96  964        DC    XL1'03'              LENGTH OF PACK FIELD
   5A97 72AC            5A98  965        DC    AL2(WORK1)           @ OF PACKED FIELD
   5A99 0A85            5A9A  966        DC    AL2(READIN+5)        @ OF UNPACKED FIELD
   5A9B F2 87 24              967        J     NEWADR               GET RECORD ON DISK
   5A9E C0 87 021A            968 OPT12  B     PRINT
   5AA2 01              5AA2  969        DC    XL1'01'              SPACE 1
   5AA3 28              5AA3  970        DC    AL1(MENU2E-MENU25)   LENGTH
   5AA4 6B07            5AA5  971        DC    AL2(MENU2E)          @ OF MESSAGE
   5AA6 C0 87 021A            972        B     PRINT1               PRINT INSTRUCTION FOR DISK DUMP
   5AAA 01              5AAA  973        DC    XL1'01'              SPACE 1
   5AAB 28              5AAB  974        DC    AL1(MENU2F-MENU26)   LENGTH
   5AAC 6B2F            5AAD  975        DC    AL2(MENU2F)          @ OF MESSAGE
   5AAE C0 87 021A            976        B     PRINT1               PRINT INSTRUCTION FOR DISK DUMP
   5AB2 01              5AB2  977        DC    XL1'01'              SPACE 1
   5AB3 28              5AB3  978        DC    AL1(MENU2G-MENU27)   LENGTH
   5AB4 6B57            5AB5  979        DC    AL2(MENU2G)          @ OF MESSAGE
   5AB6 C0 87 021A            980        B     PRINT1               PRINT INSTRUCTION FOR DISK DUMP
   5ABA 06              5ABA  981        DC    XL1'06'              SPACE 1
   5ABB 28              5ABB  982        DC    AL1(MENU2J-MENU55)   LENGTH
   5ABC 6BD0            5ABD  983        DC    AL2(MENU2J)          @ OF MESSAGE
   5ABE C0 87 6210            984        B     RECORD               GET DATA FROM 5471
                              985
   5AC2 0C 05 749D 0A85       986 NEWADR MVC   MSGSSB+5(6),READIN+5 SAVE CYLINDER/HEAD/RECORD
   5AC8 0C 01 620F 71EF       987        MVC   STRET+3,APATCH(2)
   5ACE 0C 05 71FD 0A85       988        MVC   SBYTE(6),READIN+5
   5AD4 C0 87 6152            989        B     CKSEC                GO CHECK FOR VALID RECORD NUMBER
   5AD8 0C 04 7227 7202       990        MVC   SAV(5),DSKFLD+4      SAVE FOR WRITING
   5ADE 3C FF 71ED            991        MVI   NPRT,X'FF'           SEEK TO THAT CYL/HEAD/RECORD
   5AE2 C0 87 55DD            992        B     LOADD
   5AE6 C0 87 021E            993        B     UNPACK               UNPACK ONE DISK RECORD
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   5AEA 00                    994        DC    IL1'0'               LENGTH OF PACKED RECORD
   5AEB 0CFF                  995        DC    AL2(BUFFER+255)      @ OF PACKED RECORD
   5AED 0FFF                  996        DC    AL2(BUFFER+1023)     @ OF UNPACKED RECORD
   5AEF C2 01 0DFF                997 DISP   LA    BUFFER+511,XR1       @ OF THE PRINT BUFFER
   5AF3 C2 02 0C00                998        LA    BUFFER,XR2           @ OF PACKED DATA
   5AF7 0C 01 702E 71D9           999        MVC   CTR(2),CHAR1         SET UP LINE COUNTER
   5AFD 0C 01 708D 702E          1000 DISP1  MVC   LINE+5(2),CTR        MOVE IN LINE # FOR PRINTING
   5B03 3C 40 70CF               1001        MVI   LINE+71,X'40'        INIT DATA LINE
   5B07 0C 3E 70CE 70CF          1002        MVC   LINE+70(63),LINE+71    "    "   "
   5B0D 1C 07 7097 08            1003        MVC   LINE+15(8),8(,XR1)   MOVE IN 8 BYTES FOR PRINTING
   5B12 1C 07 70A1 10            1004        MVC   LINE+25(8),16(,XR1)    "    "  "   "   "   "
   5B17 1C 07 70AB 18            1005        MVC   LINE+35(8),24(,XR1)    "    "  "   "   "   "
   5B1C 1C 07 70B5 20            1006        MVC   LINE+45(8),32(,XR1)    "    "  "   "   "   "
   5B21 3C 5C 70BE               1007        MVI   LINE+54,C'*'         MOVE IN ASTERISK
   5B25 3C 5C 70CF               1008        MVI   LINE+71,C'*'           "    "   "
   5B29 2C 0F 70CE 0F            1009        MVC   LINE+70(16),15(,XR2) MOVE IN DATA TO BE PRINTED
   5B2E C0 87 021A               1010        B     PRINT1               PRINT THE RECORD
   5B32 02                5B32   1011        DC    XL1'02'              SPACE 2
   5B33 48                5B33   1012        DC    IL1'72'              LENGTH OF PRINT LINE
   5B34 70CF              5B35   1013        DC    AL2(LINE+71)         ADDRESS OF PRINT LINE
   5B36 06 01 702E 71D9          1014        AZ    CTR(2),CHAR1         INCREMENT LINE COUNTER
   5B3C 0D 01 702E 71DB          1015        CLC   CTR(2),CHAR17        HAVE WE PRINTED ONE FULL LINE
   5B42 D2 01 20                 1016        LA    32(,XR1),XR1         INCREMENT TO NEXT PORTION OF REC
   5B45 E2 02 10                 1017        LA    16(,XR2),XR2           "    "  "    "    "  "  "
   5B48 C0 01 5AFD               1018        BNE   DISP1                NO,GO BACK AND PRINT
   5B4C C0 87 021A               1019 XX15   B     PRINT1               PRINT NEW MENU
   5B50 01                5B50   1020        DC    XL1'01'              SPACE ONE
   5B51 19                5B51   1021        DC    AL1(MENU6A-MENU61)   LENGTH OF PRINT LINE
   5B52 6D24              5B53   1022        DC    AL2(MENU6A)          @ OF THE PRINT LINE
   5B54 C0 87 021A               1023        B     PRINT1               PRINT NEW MENU
   5B58 01                5B58   1024        DC    XL1'01'              SPACE ONE
   5B59 1F                5B59   1025        DC    AL1(MENU6B-MENU62)   LENGTH OF PRINT LINE
   5B5A 6D43              5B5B   1026        DC    AL2(MENU6B)          @ OF THE PRINT LINE
   5B5C C0 87 021A               1027        B     PRINT1               PRINT NEW MENU
   5B60 01                5B60   1028        DC    XL1'01'              SPACE ONE
   5B61 17                5B61   1029        DC    AL1(MENU6C-MENU63)   LENGTH OF PRINT LINE
   5B62 6D5A              5B63   1030        DC    AL2(MENU6C)          @ OF THE PRINT LINE
   5B64 C0 87 021A               1031        B     PRINT1               PRINT NEW MENU
   5B68 01                5B68   1032        DC    XL1'01'              SPACE ONE
   5B69 22                5B69   1033        DC    AL1(MENU6D-MENU64)   LENGTH OF PRINT LINE
   5B6A 6D7C              5B6B   1034        DC    AL2(MENU6D)          @ OF THE PRINT LINE
   5B6C C0 87 021A               1035        B     PRINT1               PRINT NEW MENU
   5B70 06                5B70   1036        DC    XL1'06'              SPACE ONE
   5B71 16                5B71   1037        DC    AL1(MENU6E-MENU65)   LENGTH OF PRINT LINE
   5B72 6D92              5B73   1038        DC    AL2(MENU6E)          @ OF THE PRINT LINE
   5B74 38 20 0A0E               1039 XX03   TBM   U5471-1,X'20'        5471 PRESENT
   5B78 F2 10 1E                 1040        JT    XX00                 YES
   5B7B C0 87 021A               1041        B     PRINT                PRINT MSG
   5B7F 06                5B7F   1042        DC    XL1'06'
   5B80 58                5B80   1043        DC    AL1(MENU7F-MENU76)
   5B81 6EF9              5B82   1044        DC    AL2(MENU7F)
   5B83 C0 87 0222               1045        B     HALT                 STOP TO ENTER DATA FROM SWS
   5B87 D4E1              5B88   1046        DC    XL2'D4E1'
   5B89 30 00 71DF               1047        SNS   WORK,X'00'           NO,SENSE CPU DATA SWITCHES
   5B8D C0 87 021E               1048        B     UNPACK               UNPACK DATA
   5B91 02                5B91   1049        DC    IL1'02'
   5B92 71DF              5B93   1050        DC    AL2(WORK)            PACKED DATA @
   5B94 0A82              5B95   1051        DC    AL2(READIN+2)        UNPACKED DATA @
   5B96 F2 87 04                 1052        J     XX01                 DIAGNOSE INPUT
   5B99 C0 87 6210               1053 XX00   B     RECORD               READ IN OPTION SELECTED
   5B9D 3D F1 0A80               1054 XX01   CLI   READIN,C'1'          ALTER OPTION SELECTED
   5BA1 C0 81 5BD1               1055        BE    ALTER                YES,GO TO ALTER ROUTINE
   5BA5 3D F3 0A80               1056        CLI   READIN,C'3'          WRITE OPTION SELECTED
   5BA9 C0 81 5E06               1057        BE    GODOWT               YES,GO TO WRITE WRITE
   5BAD 3D F6 0A80               1058        CLI   READIN,C'6'          DISPLAY NEXT SEQUENTIAL RECORD
   5BB1 C0 81 5DF9               1059        BE    NXTSEQ               YES,DISPLAY NEXT SEQUENTIAL RECORD
   5BB5 3D F9 0A80               1060        CLI   READIN,C'9'          RETURN TO DISK/PATCH MAIN MENUE
   5BB9 C0 81 5081               1061        BE    FMENU                YES,GO DISPLAY
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   5BBD C0 87 021A            1062         B     PRINT1          PRINT ERROR MSG--INVALID OPTION
   5BC1 C6                 5BC1 1063         DC    XL1'C6'         SPACE 2
   5BC2 26                 5BC2 1064         DC    IL1'38'         LENGTH OF MSG
   5BC3 692D               5BC4 1065         DC    AL2(ERR1)       @ OF ERROR MSG
   5BC5 D4B7               5BC6 1066         DC    XL2'D4B7'
   5BC7 C0 87 0222            1067         B     HALT
   5BCB D4B7               5BCC 1068         DC    XL2'D4B7'
   5BCD C0 87 5B74            1069         B     XX03            RETURN TO OPTION MENUE
                           5BD1 1070 ALTER   EQU   *
   5BD1 0D 01 0A82 71D9       1071         CLC   READIN+2(2),CHAR1
   5BD7 F2 82 09              1072         JL    ERROR
   5BDA 0D 01 0A82 71DB       1073         CLC   READIN+2(2),CHAR17
   5BE0 F2 82 14              1074         JL    ALTER1
   5BE3 C0 87 021A            1075 ERROR   B     PRINT
   5BE7 C6                 5BE7 1076         DC    XL1'C6'
   5BE8 26                 5BE8 1077         DC    IL1'38'
   5BE9 6953               5BEA 1078         DC    AL2(ERR2)
   5BEB 44B8               5BEC 1079         DC    XL2'44B8'
   5BED C0 87 0222            1080         B     HALT
   5BF1 44B8               5BF2 1081         DC    XL2'44B8'
   5BF3 C0 87 5B74            1082         B     XX03
   5BF7 0C 01 702E 0A82       1083 ALTER1  MVC   CTR(2),READIN+2    MOVE IN LINE COUNT TO INCREMENT INTO
                              1084 *                               RECORD TO DISPLAY A 32 BYTE SEGMENT
   5BFD 0C 01 708D 0A82       1085         MVC   LINE+5(2),READIN+2 MOVE IN LINE # TO DISPLAY
   5C03 0C 01 70F9 0A82       1086         MVC   CHGLIN+5(2),READIN+2 MOVE IN LINE # TO DISPLAY
   5C09 C2 01 0DFF            1087         LA    BUFFER+511,XR1     LOAD THE @ OF THE RECORD
   5C0D F2 87 03              1088         J     INCRE1             JUMP TO INCREMENT
   5C10 D2 01 20              1089 INCRE   LA    32(,XR1),XR1       INCREMENT XR1 TO SELECTED SEGMENT
   5C13 07 01 702E 71D9       1090 INCRE1  SZ    CTR(2),CHAR1       DECREMENT COUNTER BY ONE
   5C19 C0 01 5C10            1091         BNZ   INCRE              NOT ZERO,THEN CONTI INCREMENTING
   5C1D 34 01 7032            1092         ST    SAV@,XR1           SAVE THE @ REPLACING ALTER RECORD
   5C21 1C 07 7097 08         1093         MVC   LINE+15(8),8(,XR1) MOVE IN 8 BYTES FOR PRINTING
   5C26 1C 07 70A1 10         1094         MVC   LINE+25(8),16(,XR1)  "   "  "  "  "  "
   5C2B 1C 07 70AB 18         1095         MVC   LINE+35(8),24(,XR1)  "   "  "  "  "  "
   5C30 1C 07 70B5 20         1096         MVC   LINE+45(8),32(,XR1)  "   "  "  "  "  "
   5C35 C0 87 021A            1097         B     PRINT1             PRINT RECORD THAT IS TO BE ALTERED
   5C39 02                 5C39 1098         DC    XL1'02'         SPACE 2
   5C3A 2E                 5C3A 1099         DC    IL1'46'         LENGTH OF RECORD
   5C3B 70B5               5C3C 1100         DC    AL2(LINE+45)    @ OF RECORD TO BE PRINTED
   5C3D C0 87 021A            1101         B     PRINT1          PRINT MSG
   5C41 01                 5C41 1102         DC    XL1'01'         SPACE
   5C42 1B                 5C42 1103         DC    AL1(INFO1-INFO@)  LENGTH
   5C43 69A0               5C44 1104         DC    AL2(INFO1)      MSG @
   5C45 C0 87 021A            1105         B     PRINT1          PRINT MSG
   5C49 01                 5C49 1106         DC    XL1'01'         SPACE
   5C4A 2E                 5C4A 1107         DC    AL1(INFO2-INFO8)  LENGTH
   5C4B 69CE               5C4C 1108         DC    AL2(INFO2)      MSG @
   5C4D C0 87 021A            1109         B     PRINT1          PRINT MSG
   5C51 02                 5C51 1110         DC    XL1'02'         SPACE
   5C52 30                 5C52 1111         DC    AL1(INFO3-INFOC)  LENGTH
   5C53 69FE               5C54 1112         DC    AL2(INFO3)      MSG @
   5C55 C0 87 021A            1113         B     PRINT1          PRINT MSG
   5C59 01                 5C59 1114         DC    XL1'01'         SPACE
   5C5A 32                 5C5A 1115         DC    AL1(INFO4-INFOD)  LENGTH
   5C5B 6A30               5C5C 1116         DC    AL2(INFO4)      MSG @
   5C5D C0 87 021A            1117         B     PRINT1          PRINT MSG
   5C61 01                 5C61 1118         DC    XL1'01'         SPACE
   5C62 34                 5C62 1119         DC    AL1(INFO5-INFOE)  LENGTH
   5C63 6A64               5C64 1120         DC    AL2(INFO5)      MSG @
   5C65 C0 87 021A            1121         B     PRINT1          PRINT MSG
   5C69 01                 5C69 1122         DC    XL1'01'         SPACE
   5C6A 2E                 5C6A 1123         DC    AL1(INFO6-INFOF)  LENGTH
   5C6B 6A92               5C6C 1124         DC    AL2(INFO6)      MSG @
   5C6D C0 87 021A            1125         B     PRINT1          PRINT MSG
   5C71 06                 5C71 1126         DC    XL1'06'         SPACE
   5C72 18                 5C72 1127         DC    AL1(INFO7-INFOG)  LENGTH
   5C73 6AAA               5C74 1128         DC    AL2(INFO7)      MSG @
   5C75 3C 40 7064            1129 XX33    MVI   ASTLIN+45,X'40'  INIT CHANGE LINE
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   5C79 0C 2B 7063 7064       1130         MVC   ASTLIN+44(44),ASTLIN+45
   5C7F 38 20 0A0E            1131         TBN   U5471-1,X'20'      5471 PRESENT
   5C83 F2 10 57              1132         JT    XX31               YES,USE FOR INPUT
   5C86 C2 01 0A89            1133 DATA1   LA    READIN+9,XR1       LOAD THE @ OF READ BUFFER
   5C8A 0C 01 7030 71D9       1134         MVC   CTR11(2),CHAR1     INIT CTR TO 1
   5C90 3C 01 5C99            1135         MVI   XX56,X'01'         INIT HALT IND
   5C94 C0 87 0222            1136 DATA2   B     HALT               ISSUE HALT ,READY FOR INPUT
   5C98 4401               5C99 1137 XX56    DC    XL2'4401'
   5C9A 30 00 71DF            1138         SNS   WORK,X'00'         READ DATA FROM CPU SWS
   5C9E 06 01 7030 71D9       1139         AZ    CTR11(2),CHAR1     INCREMENT HALT IND
   5CA4 C0 87 0226            1140         B     PACK
   5CA8 02                 5CAB 1141         DC    IL1'02'          LENGTH
   5CA9 7030               5CAA 1142         DC    AL2(CTR11)       UNPACKED
   5CAB 5C99               5CAC 1143         DC    AL2(XX56)        PACKED
   5CAD 34 01 7034            1144         ST    SAVXR1,XR1         SAVE XR1
   5CB1 0C 01 5CCE 7034       1145         MVC   XX34(2),SAVXR1     MOVE IN @ TO STORE DATA
   5CB7 3D 40 71DF            1146         CLI   WORK,X'40'         CHECK FOR BLANK
   5CBB F2 01 08              1147         JNE   XX37               NO,UNPACK DATA
   5CBE 4C 01 00 729A         1148         MVC   0(2,XR1),BLANK     MOVE IN BLANKS
   5CC3 F2 87 09              1149         J     XX38               CONTINE
   5CC6 C0 87 021E            1150 XX37    B     UNPACK             UNPACK DATA FROM SWS
   5CCA 01                 5CCA 1151         DC    IL1'01'
   5CCB 71DF               5CCC 1152         DC    AL2(WORK)        PACK DATA @
   5CCD 0000               5CCE 1153 XX34    DC    AL2(*-*)         UNPACK DATA @
   5CCF D2 01 02              1154 XX38    LA    2(,XR1),XR1        INCREMENT TO NEXT POS
   5CD2 3D AF 7034            1155         CLI   SAVXR1,X'AF'       DONE WITH ONE REC
   5CD6 C0 01 5C94            1156         BNE   DATA2              NO ,GO BACK FOR MORE DATA
   5CDA F2 87 04              1157         J     XX32
   5CDD C0 87 6210            1158 XX31    B     RECORD             GET ALTERED RECORD DATA
   5CE1 C2 01 7090            1159 XX32    LA    LINE+8,XR1         LOAD THE @ OF ORIGINAL RECORD
   5CE5 C2 02 0A88            1160         LA    READIN+8,XR2       LOAD THE @ OF ALTERED RECORD
   5CE9 3C 00 702E            1161         MVI   CTR,0              SET COUNTER TO ZERO
   5CED 0C 01 0A91 729A       1162         MVC   READIN+17(2),BLANK FORMAT OUTPUT RECORD
   5CF3 0C 01 0A98 729A       1163         MVC   READIN+27(2),BLANK   "   "   "
   5CF9 0C 01 0AA5 729A       1164         MVC   READIN+37(2),BLANK   "   "   "
   5CFF 8D 40 00              1165 XXX4    CLI   0(,XR2),X'40'      BLANK ENTER
   5D02 F2 01 19              1166         JNE   XXX6               NO,CHECK FOR COMPARE
   5D05 34 02 7036            1167         ST    SAVXR2,XR2         SAVE REG 2
   5D09 0C 00 5D15 702E       1168         MVC   XX44+2(1),CTR      MOVE IN DISPLACEMENT VALUE
   5D0F C2 02 70FC            1169         LA    CHGLIN+8,XR2       LOAD THE @ OF THE CHG LINE
   5D13 9C 00 00 00           1170 XX44    MVC   0(1,XR2),0(,XR1)   MOVE IN UNCHANGED BYTE
   5D17 35 02 7036            1171         L     SAVXR2,XR2         RESTORE REG 2
   5D1B F2 87 4D              1172         J     XXX5               SKIP COMPARE CHECK
   5D1E 6D 00 00 00           1173 XXX6    CLC   0(1,XR1),0(,XR2)   COMPARE ALL 32 BYTES OF RECORD
   5D22 F2 81 30              1174         JE    XX52               OK,DON'T PUT IN * IN CHG LINE
   5D25 34 01 7034            1175         ST    SAVXR1,XR1         SAVE @ OF CHANGE BYTE
   5D29 C2 01 703F            1176         LA    ASTLIN+8,XR1       LOAD THE @ OF THE CHG FLAG LINE
   5D2D 0C 00 5D35 702E       1177         MVC   XX22+2(1),CTR      LOAD THE DISPLAY OF CHG BYTE
   5D33 4C 00 00 71D1         1178 XX22    MVC   0(1,XR1),ASTER     CHARACTER * INSERTED IN CHG FLAG
   5D38 35 01 7034            1179         L     SAVXR1,XR1         RESTORE TO ORIGINAL VALUE
   5D3C 34 01 7034            1180         ST    SAVXR1,XR1         SAVE REG 2
   5D40 0C 00 5D4C 702E       1181         MVC   XX77+2(1),CTR      MOVE IN DISPLACEMENT VALUE
   5D46 C2 01 70FC            1182         LA    CHGLIN+8,XR1       LOAD THE @ OF THE CHG LINE
   5D4A 6C 00 00 00           1183 XX77    MVC   0(1,XR1),0(,XR2)   MOVE IN CHANGED BYTE
   5D4E 35 01 7034            1184         L     SAVXR1,XR1         RESTORE REG 2
   5D52 F2 87 16              1185         J     XXX5               INCREMENT TO NEXT
   5D55 34 02 7036            1186 XX52    ST    SAVXR2,XR2         SAVE REG 2
   5D59 0C 00 5D65 702E       1187         MVC   XX55+2(1),CTR      MOVE IN DISPLACEMENT VALUE
   5D5F C2 02 70FC            1188         LA    CHGLIN+8,XR2       LOAD THE @ OF THE CHG LINE
   5D63 9C 00 00 00           1189 XX55    MVC   0(1,XR2),0(,XR1)   MOVE IN CHANGED BYTE
   5D67 35 02 7036            1190         L     SAVXR2,XR2         RESTORE REG 2
   5D6B D2 01 01              1191 XXX5    LA    1(,XR1),XR1        INCREMENT TO NEXT CHARACTER
   5D6E E2 02 01              1192         LA    1(,XR2),XR2        INCREMENT TO NEXT CHAR
   5D71 0E 00 702E 7015       1193         ALC   CTR(1),ONE         DECREMENT COUNTER
   5D77 3D 26 702E            1194         CLI   CTR,X'26'          DONE WITH THE LINE
   5D7B C0 01 5CFF            1195         BNE   XXX4               NO,GO BACK
   5D7F 0C 1E 70D4 70F3       1196         MVC   LINE+76(31),LINE1  MOVE IN LINE LABEL
   5D85 C0 87 021A            1197         B     PRINT1             PRINT ALTERED RECORD
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   5D89 01               5D89 1198        DC    XL1'01'          SPACE 2
   5D8A 4D               5D8A 1199        DC    IL1'77'          LENGTH
   5D8B 70D4             5D8C 1200        DC    AL2(LINE+76)     @ OF ORIGINAL RECORD
   5D8D 0C 01 7105 729A       1201        MVC   CHGLIN+17(2),BLANK FORMAT OUTPUT RECORD
   5D93 0C 01 710F 729A       1202        MVC   CHGLIN+27(2),BLANK   "      "      "
   5D99 0C 01 7119 729A       1203        MVC   CHGLIN+37(2),BLANK   "      "      "
   5D9F C0 87 021A            1204        B     PRINT1           PRINT ALTERED RECORD
   5DA3 01               5DA3 1205        DC    XL1'01'          SPACE 1
   5DA4 5B               5DA4 1206        DC    IL1'91'          LENGTH
   5DA5 714E             5DA6 1207        DC    AL2(CHGLIN+90)   @ OF CHG LINE FLAGS
   5DA7 C0 87 021A            1208        B     PRINT1           PRINT CHANGE ASTERISKS
   5DAB 06               5DAB 1209        DC    XL1'06'          SPACE
   5DAC 51               5DAC 1210        DC    IL1'81'          LENGTH
   5DAD 7087             5DAE 1211        DC    AL2(ASTLIN+80)   ASTERISK LINE
   5DAF C0 87 021A            1212        B     PRINT1           PRINT MSG TO GIVE OPTION TO
                              1213 *                            CHANGE OR SAVE
   5DB3 01               5DB3 1214        DC    XL1'01'          SPACE 2
   5DB4 32               5DB4 1215        DC    IL1'50'          LENGTH
   5DB5 7180             5DB6 1216        DC    AL2(KEEP)        @ OF MSG
   5DB7 C0 87 021A            1217        B     PRINT1           PRINT MSG TO GIVE OPTION TO
                              1218 *                            CHANGE OR SAVE
   5DBB 01               5DBB 1219        DC    XL1'01'          SPACE 2
   5DBC 34               5DBC 1220        DC    IL1'52'          LENGTH
   5DBD 71B4             5DBE 1221        DC    AL2(KEEP1)       @ OF MSG
   5DBF C0 87 021A            1222        B     PRINT1           PRINT MSG TO GIVE OPTION TO
                              1223 *                            CHANGE OR SAVE
   5DC3 06               5DC3 1224        DC    XL1'06'          SPACE 2
   5DC4 1C               5DC4 1225        DC    IL1'28'          LENGTH
   5DC5 71D0             5DC6 1226        DC    AL2(KEEP2)       @ OF MSG
   5DC7 C0 87 0222            1227        B     HALT             HALT FOR SELECTION OF OPTION
   5DCB 44E8             5DCC 1228        DC    XL2'44E8'
   5DCD 30 00 71DF            1229        SNS   WORK,X'00'       GET RESPONSE
   5DD1 3A F0 71DF            1230        SBN   WORK,X'F0'       MAKE NUMERIC
   5DD5 3D F1 71DF            1231        CLI   WORK,X'F1'       YES
   5DD9 C0 81 5C75            1232        BE    XX33             RE-TYPE DATA
   5DDD 35 01 7032            1233        L     SAV@,XR1         LOAD THE @ OF ALTERED SEGMENT
   5DE1 4C 07 08 7103         1234        MVC   8(8,XR1),CHGLIN+15 MOVE IN CHANGED DATA TO WRITE
   5DE6 4C 07 10 710D         1235        MVC   16(8,XR1),CHGLIN+25 TO
   5DEB 4C 07 18 7117         1236        MVC   24(8,XR1),CHGLIN+35       THE
   5DF0 4C 07 20 7121         1237        MVC   32(8,XR1),CHGLIN+45             DISK
   5DF5 C0 87 5B4C            1238        B     XX15
                              1239 *
                              1240 *          WILL DISPLAY NEXT SEQUENTIAL RECORD
                              1241 *
   5DF9 C0 87 021E            1242 NXTSEQ B     UNPACK           IF SO, GO TO NEXT RECORD
   5DFD 03               5DFD 1243        DC    IL1'3'
   5DFE 7205             5DFF 1244        DC    AL2(PSBYTE)
   5E00 0A85             5E01 1245        DC    AL2(READIN+5)
   5E02 C0 87 5AC2            1246        B     NEWADR           GO SEEK TO THAT CYL/HEAD/RECORD
                              1247
   5E06 0C 04 646E 7227       1248 GODOWT MVC   DDCFM(5),SAV     MOVE IN WRITE PARAMETERS
   5E0C 3C 00 6472            1249        MVI   DDCF,0           WRITE 1 RECORD
   5E10 C0 87 0226            1250        B     PACK             PACK RECORD TO WRITE TO DISK
   5E14 80               5E14 1251        DC    IL1'128'
   5E15 0E7F             5E16 1252        DC    AL2(BUFFER+639)  @ OF UNPACKED RECORD
   5E17 0C3F             5E18 1253        DC    AL2(BUFFER+63)   @ OF PACKED RECORD
   5E19 C0 87 0226            1254        B     PACK             PACK RECORD TO WRITE TO DISK
   5E1D 80               5E1D 1255        DC    IL1'128'
   5E1E 0EFF             5E1F 1256        DC    AL2(BUFFER+767)  @ OF UNPACKED RECORD
   5E20 0C7F             5E21 1257        DC    AL2(BUFFER+127)  @ OF PACKED RECORD
   5E22 C0 87 0226            1258        B     PACK             PACK RECORD TO WRITE TO DISK
   5E26 80               5E26 1259        DC    IL1'128'
   5E27 0F7F             5E28 1260        DC    AL2(BUFFER+895)  @ OF UNPACKED RECORD
   5E29 0C8F             5E2A 1261        DC    AL2(BUFFER+191)  @ OF PACKED RECORD
   5E2B C0 87 0226            1262        B     PACK             PACK RECORD TO WRITE TO DISK
   5E2F 80               5E2F 1263        DC    IL1'128'
   5E30 0FFF             5E31 1264        DC    AL2(BUFFER+1023) @ OF UNPACKED RECORD
   5E32 0CFF             5E33 1265        DC    AL2(BUFFER+255)  @ OF PACKED RECORD
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1266
   5E34 C0 87 6475            1267        B     WINRW            WRITE ON 3340
   5E38 40               5E38 1268        DC    XL1'40'          WRITE FLAG
   5E39 0C00             5E3A 1269        DC    AL2(BUFFER)
   5E3B 6469             5E3C 1270        DC    AL2(DDCFB)
                              1271
   5E3D C0 87 021E            1272        B     UNPACK           UNPACK CYLINDER, HEAD,  AND
   5E41 01               5E41 1273        DC    IL1'1'           RECORD VALUES
   5E42 7224             5E43 1274        DC    AL2(SAV-3)
   5E44 6F3D             5E45 1275        DC    AL2(BWRT-16)
   5E46 C0 87 021E            1276        B     UNPACK
   5E4A 02               5E4A 1277        DC    IL1'2'
   5E4B 7227             5E4C 1278        DC    AL2(SAV)
   5E4D 6F41             5E4E 1279        DC    AL2(BWRT-12)
   5E4F C0 87 021A            1280        B     PRINT1
   5E53 06               5E53 1281        DC    XL1'06'           WRITTEN
   5E54 12               5E54 1282        DC    IL1'18'
   5E55 6F4D             5E56 1283        DC    AL2(BWRT)
   5E57 C0 87 59A9            1284        B     DPATCH           RETURN TO OPTION MENU AFTER WRITE
   5E5B C3C3C8C8D9D9     5E60 1285 CCHHRR DC    CL6'CCHHRR'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1287 *************************
                         1288 *
                         1289 *      THIS SUBROUTINE IS USED TO DETERMINE WHICH
                         1290 *      80 COLUMN CARD DEVICE SHOULD BE USED FOR DUPING DECKS.
                         1291 *
                         1292 *************************
                         1293
                    5E61 1294 SETCRD EQU   *
 5E61 34 08 5EE4         1295        ST    ECRD+3,ARR
 5E65 3C 00 722B         1296        MVI   CRDFLG,0              SET CARD FLAG TO ZERO
 5E69 38 20 0A0B         1297        TBN   UMFCU-1,X'20'         IS IT THE MFCU
 5E6D F2 90 07           1298        JF    *+10
 5E70 3C F0 722B         1299        MVI   CRDFLG,MFCU
 5E74 F2 87 41           1300        J     DONE
 5E77 38 20 0A11         1301        TBN   U1442-1,X'20'         IS IT THE 1442
 5E7B F2 90 3A           1302        JF    DONE
 5E7E 3C 51 722B         1303        MVI   CRDFLG,M1442
 5E82 F2 87 33           1304        J     DONE
                         1305
 5E85 39 A0 020B         1306 CKAGN  TBF   SWITCH+1,SSW1B+SSW1A      ARE SSW'S ON?
 5E89 39 01 020A         1307        TBF   SWITCH,SSW17
 5E8D F2 90 28           1308        JF    SSWSET
 5E90 C0 87 021A         1309        B     PRINT                   PRINT
 5E94 C1                 5E94 1310        DC    XL1'C1'              SSW OPTIONS
 5E95 1E                 5E95 1311        DC    IL1'30'
 5E96 7406               5E97 1312        DC    AL2(MSGNOT)
 5E98 D443               5E99 1313        DC    XL2'D443'
 5E9A C0 87 021A              1314        B     PRINT
 5E9E 81                 5E9E 1315        DC    XL1'81'
 5E9F 32                 5E9F 1316        DC    IL1'50'
 5EA0 7438               5EA1 1317        DC    AL2(MSGSET)
 5EA2 C0 87 021A              1318        B     PRINT
 5EA6 86                 5EA6 1319        DC    XL1'86'
 5EA7 3F                 5EA7 1320        DC    IL1'63'
 5EA8 7477               5EA9 1321        DC    AL2(ONLY)
 5EAA C0 87 0222              1322        B     HALT                    HALT
 5EAE D443               5EAF 1323        DC    XL2'D443'                * 43 *************************
 5EB0 C0 87 0212              1324        B     TEST
 5EB4 C0 87 5E85              1325        B     CKAGN
                              1326
                         5EB8 1327 DONE   EQU   *
 5EB8 38 01 020A              1328 SSWSET TBN   SWITCH,SSW17          SSW17 SELECTS 3741
 5EBC F2 90 04                1329        JF    *+7
 5EBF 3C 40 722B              1330        MVI   CRDFLG,M3741
 5EC3 38 80 020B              1331        TBN   SWITCH+1,SSW1B        SSW1B SELECTS 1442
 5EC7 F2 90 04                1332        JF    *+7
 5ECA 3C 51 722B              1333        MVI   CRDFLG,M1442
 5ECE 38 20 020B              1334        TBN   SWITCH+1,SSW1A        SSW1A SELECTS MFCU
 5ED2 F2 90 04                1335        JF    *+7
 5ED5 3C F0 722B              1336        MVI   CRDFLG,MFCU
 5ED9 3D 00 722B              1337        CLI   CRDFLG,0              WAS ANY DEVICE SELECTED?
 5EDD C0 81 5E85              1338        BE    CKAGN
 5EE1 C0 87 0000              1339 ECRD   B     *-*
                              1340
                              1340
                              1341 *********************************
                              1342 *
                              1343 *      THIS SUBROUTINE IS USED TO READ ONE CARD FROM THE 5424 OR
                              1344 *      1442. DATA IS READ INTO LOCATION '0880' - '08CF'.
                              1345 *      IF THE CARD IS READ FROM THE MFCU, DATA IN X'0880' - X'08DF'
                              1346 *
                              1347 *********************************
                              1348
                         5EE5 1349 READ80 EQU   *
 5EE5 34 08 5F3E              1350        ST    EREAD+3,ARR
 5EE9 3D 00 722B              1351        CLI   CRDFLG,0              HAS A READER BEEN SELECTED?
 5EED C0 81 5E61              1352        BE    SETCRD
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 5EF1 3D 51 722B              1353        CLI   CRDFLG,M1442          SHOULD THE 1442 BE USED?
 5EF5 C0 81 5F18              1354        BE    RD42
                              1355 *
                              1356 *      MFCU I/O
                              1357 *
 5EF9 C1 F0 5F3F              1358 ERR24  TIO   ERR,X'F0'             NOT READY/ERROR
 5EFD 31 F5 722D              1359        LIO   READBF,X'F5'          LOAD MFCU LSR
 5F01 F3 F1 05                1360        SIO   X'05',X'F1'          READ 1 CARD(STACKER 1)
 5F04 C1 F1 5F04              1361        TIO   *,X'F1'              WAIT FOR BUSY
 5F08 30 F3 701B              1362        SNS   STATUX,X'F3'         SENSE DEVICE STATUS
 5F0C 39 86 701B              1363        TBF   STATUX,X'86'         TEST FOR READ OR FEED CHECK
 5F10 C0 90 5EF9              1364        BF    ERR24
 5F14 C0 87 5F3B              1365        B     EREAD                RETURN
                              1366
                              1367 *
                              1368 *      1442 I/O
                              1369 *
 5F18 31 54 722D              1370 RD42   LIO   READBF,X'54'          LOAD READIN LSR (1442)
 5F1C C1 50 5F3F              1371 ERREP  TIO   ERR,X'50'             NOT READY/ERROR?
 5F20 F3 51 00                1372 MODSIO SIO   X'00',X'51'          READ 1 CARD
 5F23 C1 52 5F23              1373        TIO   *,X'52'              WAIT FOR BUSY
 5F27 3C 00 5F22              1374        MVI   MODSIO+2,X'00'
 5F2B 30 53 701B              1375        SNS   STATUX,X'53'
 5F2F 39 87 701B              1376        TBF   STATUX,X'87'         ANY ERRORS?
 5F33 39 1F 701A              1377        TBF   STATUX-1,X'1F'
 5F37 C0 90 5F1C              1378        BF    ERREP
 5F3B C0 87 0000              1379 EREAD  B     *-*                  RETURN
                              1380
                              1381 *
                              1382 *      THIS PRINTS NOT READY/ERROR MESSAGES
                              1383 *
                         5F3F 1384 ERR    EQU   *
 5F3F 34 08 5F5C              1385        ST    EERR+3,ARR
 5F43 0F 01 5F5C 7010         1386        SLC   EERR+3(2),FOUR
 5F49 C0 87 021A              1387        B     PRINT                PRINT
 5F4D C6                 5F4D 1388        DC    XL1'C6'               CARD READY
 5F4E 1E                 5F4E 1389        DC    IL1'30'                NOT READY/ERROR
 5F4F 738F               5F50 1390        DC    AL2(MSGCNR)
 5F51 D4EC               5F52 1391        DC    XL2'D4EC'
 5F53 C0 87 0222              1392        B     HALT                 HALT
 5F57 D4EC               5F58 1393        DC    XL2'D4EC'             * EC *************************
 5F59 C0 87 0000              1394 EERR   B     *-*                  RETURN
                              1395
                              1395
                              1395
                              1396 *********************************
                              1397 *
                              1398 *      THIS SUBROUTINE IS USED TO PUNCH ONE CARD FROM THE
                              1399 *      1442 OR THE 5424 OR WRITE ON THE 3741.  'BUFFER + 256' IS THE
                              1400 *      BEGINNING ADDRESS OF THE PUNCH AND PRINT DAT FIELDS.
                              1401 *
                              1402 *********************************
                              1403
                         5F5D 1404 PNCH80 EQU   *
 5F5D 34 08 600E              1405        ST    EPUN1+3,ARR          SAVE RETURN ADDRESS
 5F61 3D F0 722B              1406        CLI   CRDFLG,MFCU
 5F65 F2 81 33                1407        JE    P5424
 5F68 3D 40 722B              1408        CLI   CRDFLG,M3741         3741?
 5F6C C0 81 606C              1409        BE    RIT37
 5F70 3C 00 720C              1410        MVI   FIRST,0
 5F74 3D FF 7221              1411        CLI   FLAGC,X'FF'          SHOULD 2 FOR 1 BE MADE?
 5F78 3C 00 7221              1412        MVI   FLAGC,0              ZERO THE 2 FOR 1 FLAG
 5F7C F2 01 14                1413        JNE   NOT2F1
 5F7F 0C 13 7220 08DF         1414        MVC   SAV20(20),INPUT+95   SAVE LAST 20 BYTES
 5F85 0C 02 08CF 729A         1415        MVC   INPUT+79(3),BLANK    BLANK OUT FIELD IN 1ST CARD
 5F8B 3C E7 08CC              1416        MVI   INPUT+76,C'X'        PUT 'X' IN COLUMN 77
 5F8F 3C FF 720C              1417        MVI   FIRST,X'FF'
                         5F93 1418 NOT2F1 EQU   *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 5F93 3D 51 722B          1419         CLI   CRDFLG,M1442          1442?
 5F97 C0 81 600F          1420         BE    PUN42
                          1421 *
                          1422 *       MFCU PUNCH I/O
                          1423 *
 5F9B 3C 06 5FC6          1424 P5424   MVI   RDAGN2+2,X'06'
 5F9F 31 F5 7231          1425         LIO   ACRD,X'F5'             READ LSR
 5FA3 31 F6 71EC          1426         LIO   ABUF,X'F6'             PUNCH LSR
 5FA7 31 F4 71EC          1427         LIO   ABUF,X'F4'             PRINT LSR
 5FAB 0C 5F 0D5F 08DF     1428         MVC   BUFFER+351(96),INPUT+95 SETUP PRINT BUFFER
 5FB1 C1 F8 5F3F          1429 P24     TIO   ERR,X'F8'              NOT READY/ERROR?
 5FB5 30 F3 701B          1430         SNS   STATUX,X'F3'
 5FB9 38 10 701A          1431         TBN   STATUX-1,X'10'         CARD IN WAIT2?
 5FBD F2 10 17            1432         JT    CKBLK2
 5FC0 31 F5 7231          1433 REP1    LIO   ACRD,X'F5'
 5FC4 F3 F9 06            1434 RDAGN2  SIO   X'06',X'F9'            TO STACKER 2
 5FC7 C1 F9 5FC7          1435         TIO   *,X'F9'                WAIT FOR BUSY
 5FCB 30 F3 701B          1436         SNS   STATUX,X'F3'
 5FCF 39 86 701B          1437         TBF   STATUX,X'86'           READ OR HOPPER CHECKS?
 5FD3 C0 90 5FB1          1438         BF    P24
 5FD7 0D 5F 0B5F 729A     1439 CKBLK2  CLC   SAVCRD+95(96),BLANK    IS THE CARD BLANK?
 5FDD F2 81 08            1440         JE    PPTIO
 5FE0 3C 04 5FC6          1441         MVI   RDAGN2+2,X'04'         REJECT TO STACKER 4
 5FE4 C0 87 5FC0          1442         B     REP1
 5FE8 C1 F8 5F3F          1443 PPTIO   TIO   ERR,X'F8'
 5FEC 31 F5 7231          1444         LIO   ACRD,X'F5'
 5FF0 F3 FF 06            1445         SIO   X'06',X'FF'            READ,FEED,PUNCH,PRINT
 5FF3 C1 FF 5FF3          1446         TIO   *,X'FF'                WAIT FOR BUSY
 5FF7 30 F3 701B          1447 KPSNS   SNS   STATUX,X'F3'
 5FFB 39 80 701A          1448         TBF   STATUX-1,X'80'         WAIT FOR PRINT BUFFER 1 TO DROP
 5FFF C0 90 5FF7          1449         BF    KPSNS
 6003 39 FE 701B          1450         TBF   STATUX,X'FE'           ANY ERRORS?
 6007 C0 90 5FE8          1451         BF    PPTIO
 600B C0 87 0000          1452 EPUN1   B     *-*                    RETURN TO CALLER
                          1453
                          1454 *
                          1455 *       1442 PUNCH I/O
                          1456 *
 600F 0C 4F 0ACF 08CF     1457 PUN42   MVC   DUMMY+79(80),INPUT+79 PUT DATA TO BE PUNCH INTO TEMP
 6015 C0 87 5EE5          1458 RDAGN1  B     READ80                 READ ONE CARD
 6019 0D 4F 08CF 729A     1459         CLC   INPUT+79(80),BLANK     MAKE SURE CARD IS BLANK BEFORE PNCH
 601F F2 81 08            1460         JE    DATOK
 6022 3C 01 5F22          1461         MVI   MODSIO+2,X'01'         EJECT NON-BLANK CARDS INTO
 6026 C0 87 6015          1462         B     RDAGN1                 STACKER 2
 602A 31 54 722F          1463 DATOK   LIO   ADUM,X'54'             LOAD PUNCH LSR
 602E 31 50 7233          1464         LIO   NUMPUN,X'50'           LOAD COUNT LSR (128-N)
 6032 C1 50 5F3F          1465 ERRPUN  TIO   ERR,X'50'              NOT READY/ERROR?
 6036 F3 54 00            1466         SIO   X'00',X'54'            PUNCH ONLY
 6039 C1 52 6039          1467         TIO   *,X'52'                WAIT FOR BUSY TO DROP
 603D 30 53 701B          1468         SNS   STATUX,X'53'
 6041 39 36 701B          1469         TBF   STATUX,X'36'           CHECK FOR ANY ERRORS
 6045 39 0F 701A          1470         TBF   STATUX-1,X'0F'
 6049 C0 90 6032          1471         BF    ERRPUN
 604D 3D FF 720C          1472         CLI   FIRST,X'FF'            DOES SECOND 20 BYTES NEED PUNCHING
 6051 3C 00 720C          1473         MVI   FIRST,0
 6055 F2 01 10            1474         JNE   EPUN                   NO,THEN JUMP
 6058 0C 3B 08CF 729A     1475         MVC   INPUT+79(60),BLANK     CLEAR CARD
 605E 0C 13 0893 7220     1476         MVC   INPUT+19(20),SAV20     GET LAST 20 BYTES
 6064 C0 87 5F93          1477         B     NOT2F1
 6068 C0 87 600B          1478 EPUN    B     EPUN1                  RETURN
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          1480 ********************************************************************************
                          1481 *              WRITE A RECORD ON THE 3741
                          1482 ********************************************************************************
                          1483
 606C 3D 00 729D          1484 RIT37   CLI   DFLAG,0                 CHECK FOR TAP OR DATA DECK
 6070 F2 81 06            1485         JE    *+9                     JUMP IF IT IS NOT
 6073 0C 01 7019 7015     1486         MVC   NUM(2),ONE              SET UP TO LOOK FOR A ONE
 6079 0D 01 7021 7019     1487         CLC   SECNT(2),NUM            CHECK FOR LAST CARD
 607F F2 01 04            1488         JNE   *+7                     JUMP IF NOT LAST CARD
 6082 3A 80 6F5E          1489         SBN   FLAG,X'80'              SET LAST RECORD FLAG
 6086 31 41 6F55          1490         LIO   FUNREG,X'41'            LOAD FUNCTION REG
 608A 0C 5F 0D5F 08DF     1491         MVC   BUFFER+351(96),INPUT+95 SETUP PRINT BUFFER                    03
 6090 30 43 6F5D          1492 XFER    SNS   TRANS,X'43'             SENSE XFER REG
 6094 38 01 6F5C          1493         TBN   TRANS-1,X'01'           TEST FOR WRITE MODE
 6098 F2 10 1C            1494         JT    OK                      JUMP IF ON
 609B C0 87 021A          1495         B     PRINT                   PRINT
 609F C1                  1496         DC    XL1'C1'                 '3741 IS NOT IN THE INPUT MODE'
 60A0 1D                  1497         DC    IL1'29'
 60A1 6FDF                1498         DC    AL2(NOTIN)
 60A3 DDE9                1499         DC    XL2'DDE9'
 60A5 C0 87 021A          1500         B     PRINT                   PRINT
 60A9 06                  1501         DC    XL1'06'                 'PUT IT IN THE INPUT MODE AND RESET
 60AA 2B                  1502         DC    IL1'43'                  THE HALT'
 60AB 700A                1503         DC    AL2(PINW)
 60AD C0 87 0222          1504         B     HALT                    ERROR HALT -E9-
 60B1 DDE9                1505         DC    XL2'DDE9'
 60B3 C0 87 6090          1506         B     XFER
                          1507
 60B7 C1 40 6102          1508 OK      TIO   ERRCHK,X'40'            TEST FOR THE 3741 NOT READY
 60BB 0C 01 60C8 6F51     1509         MVC   LD37+3(2),RD00          SET UP LIO AREA                       03
                          1510
 60C1 F3 43 08            1511         SIO   FORRES,CONT1            RESPONSE TO 3741
 60C4 31 42 6F57          1512         LIO   LEN128,X'42'            LOAD LENGTH COUNT REG
 60C8 31 44 0000          1513 LD37    LIO   *-*,X'44'               LOAD DAR
 60CC F3 42 00            1514         SIO   X'00',X'42'             WRITE A RECORD
 60CF C1 42 60CF          1515         TIO   *,X'42'                 LOOP ON BUSY
                          1516
 60D3 C1 40 6102          1517         TIO   ERRCHK,X'40'            TEST FOR ERROR OR NOT READY
                          1518
 60D7 F3 43 08            1519 ENDRES  SIO   FORRES,CONT1            RESPONSE TO 3741
 60DA 30 43 6F5D          1520 WAIT    SNS   TRANS,X'43'             SENSE XFER REG
 60DE 38 01 6F5C          1521         TBN   TRANS-1,X'01'           TEST FOR WRITE MODE
 60E2 C0 90 60DA          1522         BF    WAIT
                          1523
 60E6 38 80 6F5E          1524         TBN   FLAG,X'80'              TEST FOR LAST RECORD FLAG
 60EA F2 10 04            1525         JT    TSTEND                  JUMP IF IT'S ON
 60ED C0 87 6068          1526         B     EPUN                    RETURN
                          1527
 60F1 3B FF 6F5E          1528 TSTEND  S&F   FLAG,X'FF'              TURN OFF ALL 3741 FLAGS
 60F5 0C 01 7019 7017     1529         MVC   NUM(2),ZERO             ZERO CARD COUNT
 60FB F3 43 50            1530 DSENDT  SIO   X'50',CONT1             SET END OF JOB TO 3741
 60FE C0 87 6068          1531         B     EPUN                    RETURN
                          1532
                          1533 ********************************************************************************
                          1534 *     THIS SECTION RESPONDS TO 3741 TIO FOR ERROR
                          1535 ********************************************************************************
 6102 34 08 6123          1536 ERRCHK  ST    NOERR+3,ARR             SAVE THE ARR
 6106 0F 01 6123 700E     1537         SLC   NOERR+3(2),X4           SUBTRACT 4 FROM RETURN ADDRESS
                          1538
 610C 30 42 6F5B          1539         SNS   STATUS,X'42'            SENSE STATUS REG
 6110 38 02 6F5A          1540         TBN   STATUS-1,X'02'          TEST FOR OVRFLO
 6114 C0 10 6124          1541         BT    OVFLO                   BRANCH IF IT IS
 6118 38 08 6F5A          1542         TBN   STATUS-1,X'08'          TEST FOR P CHECK
 611C C0 10 6138          1543         BT    PCHECK                  BRANCH IF IT IS
                          1544
 6120 C0 87 0000          1545 NOERR   B     *-*                     GO TRY TIO AGAIN
                          1546
                          1547 ********************************************************************************
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   6124 C0 87 021A            1548 OVFLO  B     PRINT          PRINT
   6128 C6                 6128 1549      DC    XL1'C6'        'LENGTH COUNT OVERFLO - RESTART JOB'
   6129 22                 6129 1550      DC    IL1'34'
   612A 6F99               6128 1551      DC    AL2(LCROVR)
   612C DDE2               612D 1552      DC    XL2'DDE2'
   612E C0 87 0222            1553        B     HALT           ERROR HALT -E2-
   6132 DDE2               6133 1554      DC    XL2'DDE2'
   6134 F3 43 10              1555        SIO   X'10',CONT1    ISSUE 'SENSE RESPONSE'
   6137 C0 87 510D            1556        B     GET1           RESTART JOB
                              1557
   613B C0 87 021A            1558 PCHECK B     PRINT          PRINT
   613F C6                 613F 1559      DC    XL1'C6'        'PARITY ERROR - RESET 3741 AND
   6140 29                 6140 1560      DC    IL1'41'         RESTART  JOB'
   6141 6FC2               6142 1561      DC    AL2(PARERR)
   6143 DDE3               6144 1562      DC    XL2'DDE3'      ERROR HALT -E3-
   6145 C0 87 0222            1563        B     HALT
   6149 DDE3               614A 1564      DC    XL2'DDE3'      ISSUE SENSE RESPONSE
   6148 F3 43 10              1565        SIO   X'10',CONT1    RESTART JOB
   614E C0 87 510D            1566        B     GET1
```


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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                           1568 *
                           1569 *
                           1570 *
                           1571 *       THIS SUBROUTINE DETERMINES IF A VALID CYLINDER/HEAD/RECORD
                           1572 *       WAS SELECTED.  CONTENTS OF ADDRESS IN 'SBYTE' ALSO CHECKS
                           1573 *       THAT NUMBERS ENTERED ARE VALID HEX.
                           1574 *
   6152 34 08 61C2         1575 CKSEC  ST    ECKSEC+3,ARR
   6156 3C 06 702C         1576        MVI   COUNTR,6
   615A 34 01 7034         1577        ST    SAVXR1,XR1
   615E C2 01 71F8         1578        LA    SBYTE-5,XR1      SETUP TO CHECK FIRST BYTE
   6162 7D C1 00           1579 DOAGAN CLI   0(,XR1),C'A'     IF LESS THAT 'C1', ERROR
   6165 F2 82 6E           1580        JL    ERROR1
   6168 7D C6 00           1581        CLI   0(,XR1),C'F'     IF GREATER THAN 'C6', CK NUMBERS
   616B F2 84 03           1582        JH    CK
   616E F2 87 0C           1583        J     OKHEX            OTHERWISE, VALID HEX
                           1584
   6171 7D F0 00           1585 CK     CLI   0(,XR1),C'0'     IF LESS THAN 'F0',ERROR
   6174 F2 82 5F           1586        JL    ERROR1
   6177 7D F9 00           1587        CLI   0(,XR1),C'9'     IF GREATER THAN 'F9', ERROR
   617A F2 84 59           1588        JH    ERROR1
   617D D2 01 01           1589 OKHEX  LA    1(,XR1),XR1      CHECK NEXT   BYTE
   6180 0F 00 702C 7015    1590        SLC   COUNTR(1),ONE
   6186 C0 01 6162         1591        BNZ   DOAGAN
   618A 35 01 7034         1592        L     SAVXR1,XR1
                           1593 *
                           1594 *       THIS WILL ENSURE ENTRIES ARE NOT TOO LARGE
                           1595 *
   618E C0 87 0226         1596        B     PACK             PACK CONTROL FIELD
   6192 06                 6192 1597      DC    IL1'6'         LENGTH
   6193 71FD               6194 1598      DC    AL2(SBYTE)     SOURCE FIELD
   6195 7205               6196 1599      DC    AL2(PSBYTE)    DEST FIELD
                           1600
   6197 3D 21 7203         1601        CLI   PSBYTE-2,33      IS CYL FIELD <34?
   619B F2 84 4B           1602        JH    INVCYL           IF NOT, GO PRINT ERROR
   619E 3D 13 7204         1603        CLI   PSBYTE-1,19      IS HEAD  FIELD < 19?
   61A2 F2 84 1E           1604        JH    INVTRK           IF NOT, GO PRINT ERROR
   61A5 3D 00 7205         1605        CLI   PSBYTE,0         IF RECORD IS 0, GO PRINT ERROR
   61A9 F2 81 50           1606        JE    INVREC
   61AC 3D 30 7205         1607        CLI   PSBYTE,48        IS RECORD FIELD < 49?
   61B0 F2 84 49           1608        JH    INVREC           IF NOT, GO PRINT ERROR
                           1609
   61B3 0C 00 71FF 7203    1610        MVC   DSKFLD+1(1),PSBYTE-2  MOVE PARAMETERS IN DISK DRIVE
   61B9 0C 01 7202 7205    1611        MVC   DSKFLD+4(2),PSBYTE    CONTROL FIELD
   61BF C0 87 0000         1612 ECKSEC B     *-*
                           1613
                           1613
   61C3 C0 87 021A         1614 INVTRK B     PRINT            PRINT INVALID HEAD   NUMBER
   61C7 C6                 61C7 1615      DC    XL1'C6'
   61C8 36                 61C8 1616      DC    AL1(MSGSEC-MSGSCB)
   61C9 753E               61CA 1617      DC    AL2(MSGSEC)
   61CB D446               61CC 1618      DC    XL2'D446'
   61CD C0 87 0222            1619        B     HALT             ERROR
   61D1 D446               61D2 1620      DC    XL2'D446'         * 46 ****************************
   61D3 F2 87 36              1621        J     STRET
                              1622
   61D6 C0 87 021A         1623 ERROR1 B     PRINT            PRINT INVALID HEX NUMBER
   61DA C6                 61DA 1624      DC    XL1'C6'
   61DB 33                 61DB 1625      DC    IL1'51'
   61DC 7594               61DD 1626      DC    AL2(MSGHEX)
   61DE D447               61DF 1627      DC    XL2'D447'
   61E0 C0 87 0222            1628        B     HALT             ERROR
   61E4 D447               61E5 1629      DC    XL2'D447'         * 47 ****************************
   61E6 F2 87 23              1630        J     STRET            RETURN TO THE MENU
                              1631
   61E9 C0 87 021A         1632 INVCYL B     PRINT            PRINT
   61ED C6                 61ED 1633      DC    XL1'C6'           INVALID
   61EE 3E                 61EE 1634      DC    AL1(MSGTB-MSGTBB)  CYLINDER
```

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   61EF 75D2             61F0 1635         DC    AL2(MSGTB)
   61F1 D448             61F2 1636         DC    XL2'D448'
   61F3 C0 87 0222            1637         B     HALT
   61F7 D448             61F8 1638         DC    XL2'D448'
   61F9 F2 87 10              1639         J     STRET
                              1640
   61FC C0 87 021A            1641 INVREC  B     PRINT
   6200 C6               6200 1642         DC    XL1'C6'
   6201 41               6201 1643         DC    AL1(MSINRC-MSINRB)
   6202 7508             6203 1644         DC    AL2(MSINRC)
   6204 D449             6205 1645         DC    XL2'D449'
                              1646
   6206 C0 87 0222            1647         B     HALT
   620A D449             620B 1648         DC    XL2'D449'
   620C C0 87 0000            1649 STRET   B     *-*

ERROR
* 48 ******************************

PRINT 'INVALID RECORD ENTERED'

LENGTH

ID

ERROR
* 49 ******************************
```


D443 S/3 3340 AND CARD UTILITIES --- MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1651 ************************************************************
                              1652 *   5471 INPUT ROUTINE                                     *
                              1653 *                                                          *
                              1654 *                                                          *
                              1655 *   CODE TO READ RECORD FROM THE 5471 PRINTER/KEYBOARD     *
                              1656 ************************************************************
                              1657
   6210 34 08 627C            1658 LD5471 EQU   *
   6214 35 02 6242            1659         ST    NOTBLK+3,ARR          SAVE RETURNNING @
   6218 BC 40 83              1660 RTRY    L     XEXIT1+3,XR2          LOAD THE @ OF THE READ BUFFER
   621B AC 82 82 83           1661         MVI   131(,XR2),X'40'        CLEAR BUFFER
   621F F3 18 41              1662         MVC   130(131,XR2),131(,XR2) CLEAR BUFFER
   6222 F3 10 11              1663         SIO   X'41',X'18'           START CARRIAGE RETURN + RESET PRT
   6225 30 11 7235            1664 NXTCHR  SIO   X'11',X'10'           PROCEED IND ON + RESET REQUEST KEY
   6229 38 40 7235            1665 RESNS   SNS   DAT,X'11'             CHARACTER KEYED
   622D F2 90 17              1666         TBN   DAT,X'40'             END OR CANCEL KEYED
   6230 3C 3D 722A            1667         JF    TSTDAT                NO
   6234 38 20 7235            1668         MVI   STATU1,X'3D'          BLANK RECORD TO BE RETURNED
   6238 C0 10 6214            1669         TBN   DAT,X'20'             CANCEL KEYED
   623C F3 10 01              1670         BT    RTRY                  YES
   623F C2 02 0A80            1671         SIO   1,X'10'               RESET REQUEST KEY
   6243 C0 87 6276            1672 XEXIT1  LA    READIN,XR2            LOAD THE @ OF THE BUFFER
   6247 38 08 7235            1673         B     DORD                  CHECK FOR INPUT
   624B C0 90 6225            1674 TSTDAT  TBN   DAT,X'08'             DATA KEYED
   624F 38 04 7235            1675         BF    RESNS                 NO
   6253 C0 10 6214            1676         TBN   DAT,X'04'             RETURN KEYED PRESSED
   6257 8C 00 00 7234         1677         BT    RTRY                  YES
   625C 31 18 7235            1678         MVC   0(1,XR2),DAT-1
   6260 F3 18 81              1679         LIO   DAT,X'18'
   6263 E2 02 01              1680         SIO   X'81',X'18'           MOVE CHARACTER TO BE PRINTED
   6266 34 02 7235            1681         LA    1(,XR2),XR2           PRINT CHARACTER
   626A 3D E0 7235            1682         ST    TSTN,XR2              MOVE TO NEXT CHARACTER
   626E C0 81 623F            1683         CLI   TSTN,X'E0'
   6272 C0 87 6222            1684         BE    *EXIT1
   6276 F3 18 40              1685         B     NXTCHR
   6279 C0 87 0000            1686 DORD    SIO   X'40',X'18'           RETURN CARRIAGE
                              1687 NOTBLK  B     *-*                   RETURN TO CALLER
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1689 *************
                         1690 *  STPFLD   *
                         1691 ***************************************************************************
                         1692 *      THIS SUBRT STEPS THE DISK DRIVE CONTROL FIELD TO                   *
                         1693 *      THE NEXT RECORD.                                                   *
                         1694 *      THE FORMAT FOLLOWS:                                                *
                         1695 *                                                                         *
                         1696 *      B     STPFLD                                                       *
                         1697 *      DC    AL2(*-*)              THIS IS THE RIGHT END ADDRESS OF       *
                         1698 *                                  A FIVE BYTE FIELD CONTAINING           *
                         1699 *                                  C C H H R.                             *
                         1700 *                                                                         *
                         1701 ***************************************************************************
                         1702
                         1702
627D 0000000000          6281 1703 DDCFX  DC    5IL1'0'
6282 0000                6283 1704 TEMP4  DC    IL2'0'
                         1705
                         1705
6284 34 08 62E9               1706 STPFLD ST    STPFLR+3,ARR          SAVE ADDRESS
6288 0E 01 62E9 7015          1707        ALC   STPFLR+3(2),ONE       POINT TO FIELD ADDRESS
628E 0C 01 6299 62E9          1708        MVC   MVC6+5(2),STPFLR+3    OVERLAY INSTRUCTION
6294 0C 01 629F 0000          1709 MVC6   MVC   MVC3+5(2),*-*
629A 0C 04 6281 0000          1710 MVC3   MVC   DDCFX(5),*-*          MOVE IN FIELD TO BE WORKED ON
62A0 0E 01 62E9 7015          1711        ALC   STPFLR+3(2),ONE       POINT TO RETURN ADDRESS
                              1712
62A6 3D 30 6281               1713        CLI   DDCFX,48            IS R FIELD EQUAL TO 48?
62AA F2 02 09                 1714        JNL   INCHD               THEN GO TO NEW HEAD
62AD 0E 00 6281 7015          1715        ALC   DDCFX(1),ONE        INCREMENT REC #
6283 F2 87 24                 1716        J     CONTA8
                              1717
6286 3D 13 6280               1718 INCHD  CLI   DDCFX-1,19           IS HEAD # 19?
628A F2 02 0D                 1719        JNL   INCCL               THEN INCREMENT CYLINDER
628D 3C 01 6281               1720        MVI   DDCFX,1             RESET TO  RECORD 1
62C1 0E 01 6280 7015          1721        ALC   DDCFX-1(2),ONE      INCREMENT HEAD
62C7 F2 87 10                 1722        J     CONTA8
                              1723
62CA 0E 01 627E 7015          1724 INCCL  ALC   DDCFX-3(2),ONE       INCREMENT CYLINDER
62D0 0C 01 6280 7017          1725        MVC   DDCFX-1(2),ZERO      HEAD 0
62D6 3C 01 6281               1726        MVI   DDCFX,1             RECORD 1
                              1727
62DA 0C 01 62E3 629F          1728 CONTA8 MVC   MVC4+3(2),MVC3+5     OVERLAY INSTRUCTION
62E0 0C 04 0000 6281          1729 MVC4   MVC   *-*(5),DDCFX          REPLACE FIELD
                              1730
62E6 C0 87 0000               1731 STPFLR B     *-*                 RETURN TO CALLER
                              1732
                              1732
                              1732
                              1732
                              1732
                              1732
                              1733 *************
                              1734 *  SCNVTC   *
                              1735 ***************************************************************************
                              1736 *      THIS SUBROUTINE SCANS VTOC FOR THE ID IN THE PARAMETER             *
                              1737 *      LIST.  IT THEN SETS A FLAG INDICATING SCAN HIT OR NOT.             *
                              1738 *      THE ADDRESS OF THE HIT AND ITS CONTENTS ARE SAVED.                 *
                              1739 *                                                                         *
                              1740 *      FORMAT FOLLOWS:                                                    *
                              1741 *                                                                         *
                              1742 *      B     SCNVTC                                                       *
                              1743 *      DS    XL1                 FLAG DEPOSITED BY SUBROUTINE           *
                              1744 *      DC    CL3'PID'            PROGRAM ID TO SCAN FOR IN VTOC         *
                              1745 *                                                                         *
                              1746 *            FLAG BYTE:          X'00'=  NO SCAN HIT THROUGH ENTIRE     *
                              1747 *                                        CONTENTS OF VTOC                 *
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              1748 *                                  X'0F'=  SCAN HIT
                              1749 *      NOTE: ON NO SCAN HIT THE ADDRES LEFT IN THE DDCF FIELD IS      *
                              1750 *            THE NEXT AVAILABLE RECORD FOR VTOC.                      *
                              1751 *                                                                     *
                              1752 *      NOTE: TO SCAN TO END OF VTOC, PUT '***' IN PRGID               *
                              1753 *                                                                     *
                              1754 ***************************************************************************
                              1755
                              1755
62EA FFFD                62E8 1756 NEG3   DC    IL2'-3'
                         0C00 1757 DDDF   EQU   BUFFER
62EC 0002000001          62F0 1758 VTOCAD DC    XL5'0002000001'
62F1 0004000001          62F5 1759 C4HOR1 DC    XL5'0004000001'
62F6 0003001001          62FA 1760 C3H161 DC    XL5'0003001001'
62FB 0030                62FC 1761 D48    DC    IL2'48'
                         62FD 1762 FASINB EQU   *
62FD C6C1E2              62FF 1763 FAS    DC    CL3'FAS'
6300 0000000000000000    6308 1764 FASINF DC    9IL1'0'
6308 00                       1764
                         6305 1765 FASINM EQU   FASINB+8
6309 5C5C5C              6308 1766 AST    DC    CL3'***'
630C 0000                630D 1767 TEMP3  DC    IL2'0'
630E 00FF                630F 1768 X255   DC    IL2'255'
                              1769
                              1769
                              1769
6310 34 08 6418               1770 SCNVTC ST    SCNVTR+3,ARR          SAVE RETURN ADDRESS
6314 34 01 630D               1771        ST    TEMP3,XR1             SAVE XR1
6318 35 01 6418               1772        L     SCNVTR+3,XR1          LOAD XR1
                              1773
631C 0E 01 6418 7010          1774        ALC   SCNVTR+3(2),FOUR      INCREMENT TO RETURN ADDRESS
                              1775 *
                              1776 *            READ FAS RECORD TO SEE HOW MANY ENTRIES
                              1777 *            IN VTOC TO SCAN
                              1778 *
6322 0C 04 646E 62FA          1779        MVC   DDCFM(5),C3H161       SET UP DDCF FIELD TO READ FAS RCRD
6328 3C 00 6472               1780        MVI   DDCF,0
632C C0 87 6475               1781        B     WINRW                 READ FAS
6330 80                  6330 1782        DC    XL1'80'               READ
6331 0C00                6332 1783        DC    AL2(DDDF)             @ OF DDDR CONTENTS
6333 6469                6334 1784        DC    AL2(DDCFB)            @ OF DDCR CONTENTS
                              1785
6335 0D 02 0C02 62FF          1786        CLC   DDDF+2(3),FAS         IS THIS A VIRGIN PACK?
633B F2 01 09                 1787        JNE   *+12                  JUMP IF IT IS.
633E 0C 08 6308 0C0B          1788        MVC   FASINF(9),DDDF+11     MOVE INFO  TO DESIRED PLACE
6344 F2 87 14                 1789        J     CONTE1
                              1790
6347 0C 01 6308 7017          1791        MVC   FASINF(2),ZERO        ZERO VTOC ENTRIES
634D 0C 04 6305 62F5          1792        MVC   FASINB+8(5),C4HOR1    PUT IN SECTOR OF FIRST FIELD
6353 3C 00 6306               1793        MVI   FASINB+9,0            ZERO FIELD DELIMITERS
6357 3C 00 6300               1794        MVI   FASINB+3,0
                              1795
635B 0C 04 646E 62F0          1796 CONTE1 MVC   DDCFM(5),VTOCAD       SET DDCF
6361 3C 00 6472               1797        MVI   DDCF,0
                              1798
6365 0D 01 6308 7017          1799        CLC   FASINF(2),ZERO        SEE IF VIRGIN PACK
636B F2 81 87                 1800        JE    END1                  GO HANDLE IT
                              1801
636E D2 01 03                 1802        LA    3(,XR1),XR1           INCREMENT XR1
6371 34 01 638E               1803        ST    MVC1+5,XR1            OVERLAY MOVE INSTRUCTION
6375 36 01 62EB               1804        A     NEG3,XR1              DECREMENT XR1 BY 3
                              1805
6379 3C FF 0CFF               1806        MVI   DDDF+255,X'FF'        FILL DDDF WITH X'FF'
637D 0C FE 0CFE 0CFF          1807        MVC   DDDF+254(255),DDDF+255
                              1808
6383 0C 03 0C03 72A9          1809        MVC   DDDF+3(4),ACTO        PUT IN SCAN PARAMETERS
6389 0C 02 0C06 0000          1810 MVC1   MVC   DDDF+6(3),*-*
                              1811
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 638F 0D 02 0C06 630B     1812          CLC   DDDF+6(3),AST        IF PID DOESN'T = '***'
 6395 F2 G1 0A            1813          JNE   *+13                 THEN JUMP
 6398 3C 00 0C7F          1814          MVI   DDDF+127,0           OTHERWISE ZERO OUT HALF OF SCAN FLD
 639C 0C 7E 0C7E 0C7F     1815          MVC   DDDF+126(127),DDDF+127
                          1816
 63A2 3C 00 729F          1817          MVI   LSTSCN,0
 63A6 0C 00 63E0 6419     1818          MVC   TIO18+1(1),DRIVE#    OVERLAY TIO INST
 63AC 3A 03 63E0          1819          SBN   TIO18+1,X'03'
 63B0 0C 01 72A1 6308     1820          MVC   TEMP2(2),FASINF      KEEP HEAD  OF VTOC #
                          1821
 63B6 0D 01 72A1 630F     1822 LOOP8    CLC   TEMP2(2),X255        IS # OF RECORDS TO SCAN >255?
 63BC F2 04 0D            1823          JNH   *+16                 SKIP IF NOT
 63BF 0F 01 72A1 630F     1824          SLC   TEMP2(2),X255        DECREMENT COUNTER
 63C5 3C FE 6472          1825          MVI   DDCF,254             SET DDCF
 63C9 F2 87 0A            1826          J     *+13                 SKIP
                          1827
 63CC 0C 00 6472 72A1     1828          MVC   DDCF(1),TEMP2
 63D2 3C FF 729F          1829          MVI   LSTSCN,X'FF'         SET LAST  SCAN FLAG
                          1830
 63D6 C0 87 6475          1831          B     WINRW                SCAN READ
 63DA 20                  63DA 1832     DC    XL1'20'              a OF DDDF
 63DB 0C00                63DC 1833     DC    AL2(DDDF)            a OF DDCF
 63DD 6469                63DE 1834     DC    AL2(DDCFB)
                          1835
 63DF C1 00 63FC          1836 TIO18    TIO   CONTE5,*-*           IS IT SCAN   HIT?
                          1837
 63E3 C0 87 6284          1838          B     STPFLD               INCREMENT SCAN DDCF FIELD
 63E7 646E                63E8 1839     DC    AL2(DDCFM)
                          1840
 63E9 3D FF 729F          1841          CLI   LSTSCN,X'FF'         IS LAST SCAN FLAG SET?
 63ED C0 01 63B6          1842          BNE   LOOP8                RETURN IF NOT
                          1843
 63F1 34 01 63F8          1844          ST    MVI1+3,XR1           OVERLAY MVI  INST
                          1845
                          63F5 1846 END1  EQU   *                  RESET SCAN HIT FLAG
 63F5 3C 00 0000          1847 MVI1     MVI   *-*,0                RETURN
 63F9 F2 87 15            1848          J     SCNVTE
                          1849
 63FC 34 01 6403          1850 CONTE5   ST    MVI2+3,XR1           OVERLAY INSTRUCTION
 6400 3C 0F 0000          1851 MVI2     MVI   *-*,X'0F'            SET SCAN HIT FLAG
 6404 3C 00 6472          1852          MVI   DDCF,0               READ IN 1 RECORD
 6408 C0 87 6475          1353          B     WINRW                READ IN VTOC ENTRY THAT RESULTED
 640C 80                  640C 1854     DC    XL1'80'              IN THE SCAN HIT.
 640D 0C00                640E 1855     DC    AL2(DDDF)
 640F 6469                6410 1856     DC    AL2(DDCFB)
                          1857
 6411 35 01 630D          1858 SCNVTE   L     TEMP3,XR1            RELOAD XR1
 6415 C0 87 0000          1859 SCNVTR   B     *-*                  RETURN TO CALLER
                          1860
                          1860
                          1860
                          1860
                          1860
                          1860
                          1860
                          1861 ************
                          1862 *  SELDRV  *
                          1863 ************************************************************************
                          1863                                                                      *
                          1864 *                                                                    *
                          1865 *            SUBROUTINE TO TEST SENSE SWITCHES AND SELECT            *
                          1866 *            WHICH DISK DRIVE TO USE                                 *
                          1867 *                                                                    *
                          1868 ************************************************************************
                          1869
                          1869
 6419 00                  6419 1870 DRIVE# DC   IL1'0'
                          1871
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 641A 34 08 643F          1872 SELDRV ST    SLDRVR+3,ARR         SAVE RETURN ADDRESS
 641E 39 38 020C          1873          TBF   SBYTE4,SSW22+SSW23+SSW24   TEST FOR DRIVE 1
 6422 F2 90 08            1874          JF    *+11
 6425 3C C0 6419          1875          MVI   DRIVE#,DR1           SET FOR DRIVE 1
 6429 3C F1 6F3B          1876          MVI   DSKXX,C'1'
 642D 38 20 020C          1877          TBN   SBYTE4,SSW22         SSW10 ON?
 6431 F2 90 08            1878          JF    *+11                 IF NOT CONTINUE
 6434 3C C8 6419          1879          MVI   DRIVE#,DR2
 6438 3C F2 6F3B          1880          MVI   DSKXX,C'2'
                          1881 *        TBN   SBYTE4,SSW23         SSW11 ON?
                          1882 *        JF    *+11                 CONTINUE IF NOT
                          1883 *        MVI   DRIVE#,DR3           SET FOR DRIVE 3
                          1884 *        MVI   DSKXX,C'3'
                          1885 *        TBN   SBYTE4,SSW24
                          1886 *        JF    *+11
                          1887 *        MVI   DRIVE#,DR4           SET FOR DRIVE 4
                          1888 *        MVI   DSKXX,C'4'
 643C C0 87 0000          1889 SLDRVR B       *-*                  RETURN TO CALLER
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1891 ***********
                         1892 * WINRW   *
                         1893 ********************************************************************************
                         1894 *  SUBROUTINE: READ, WRITE OR SCAN N RECORDS ON 3340                           *
                         1895 *                    ACCESS FORMAT:                                            *
                         1896 *       B     WINRW                BRANCH TO SUBROUTINE                       *
                         1897 *       DC    XL1                  FLAG                                       *
                         1898 *       DC    AL2(*-*)             @ OF DISK DRIVE DATA FIELD                 *
                         1899 *       DC    AL2(*-*)             @ OF DISK DRIVE CONTROL FIELD              *
                         1900 *                                                                             *
                         1901 *       FLAG BITS (NO MORE THAN ONE BIT ON AT A TIME)                         *
                         1902 *            BIT                                                              *
                         1903 *            0-     SEEK AND READ                                             *
                         1904 *            1-     SEEK AND WRITE                                            *
                         1905 *            2-     SEEK AND SCAN READ                                        *
                         1906 *                                                                             *
                         1907 *       VALUES OF BYTE 'DRIVE#:                                               *
                         1908 *            DRIVE 1              'DRIVE#'= X'C0'                             *
                         1909 *            DRIVE 2              'DRIVE#'= X'C8'                             *
                         1910 *            DRIVE 3              'DRIVE#'= X'D0'                             *
                         1911 *            DRIVE 4              'DRIVE#'= X'D8'                             *
                         1912 *                                                                             *
                         1913 ********************************************************************************
6440 0000000000000000 6449 1914 DDCFE  DC    1OIL1'0'
6448 0000             1914
644A 0000             644B 1915 TDDDR  DC    IL2'0'
                      644C 1916 QUITFG EQU   *
644C 0000             644D 1917 TDDCR  DC    IL2'0'
                      644E 1918 TDDDF  EQU   *
644E 0000000000000000 6456 1919        DC    9IL1'0'
6456 00               1919
                      6457 1920 TDDCF  EQU   *
6457 0000000000       645B 1921        DC    5IL1'0'
645C 6457             645D 1922 TDDCF@ DC    AL2(TDDCF)
645E 644E             645F 1923 TDDDF@ DC    AL2(TDDDF)
6460 0000             6461 1924 STATE  DC    IL2'0'
6462 0009             6463 1925 D9     DC    IL2'9'
6464 0005             6465 1926 D5     DC    IL2'5'
6466 0003             6467 1927 D3     DC    IL2'3'
6468 00               6468 1928 ICTR   DC    IL1'0'
                      6469 1929 DDCFB  EQU   *
6469 0000000000000001 6472 1930 DDCF   DC    XL10'00000000000000010000'
6471 0000             1930
                      646E 1931 DDCFM  EQU   DDCFB+5
6473 0216             6474 1932 LINKM@ DC    AL2(LINK)
                           1933
                           1933
                           1933
                           1933
6475 34 08 65F1            1934 WINRW  ST    WINRWR+3,ARR          SAVE ADDRESS
6479 34 01 71E3            1935        ST    ADDR,XR1              SAVE XR1
647D 35 01 65F1            1936        L     WINRWR+3,XR1          LOAD POINTER REGISTER
6481 0E 01 65F1 6465       1937        ALC   WINRWR+3(2),D5         SET RETURN ADDRESS TO NEXT INST
                           1938
6487 3C 0A 6468            1939        MVI   ICTR,10               INITIALIZE COUNTER
648B 1C 01 64B9 04         1940        MVC   MOV1+5(2),4(,XR1)     OVERLAY MVC INST
6490 0C 01 65ED 64B9       1941        MVC   MVI4+3(2),MOV1+5      OVERLAY MOVE INSTRUCTON
6496 0E 01 64B9 6465       1942        ALC   MOV1+5(2),D5          CHANGE POINTER
649C 0E 01 64B9 6467       1943        ALC   MOV1+5(2),D3
64A2 0C 01 64B1 64B9       1944        MVC   MVC10+3(2),MOV1+5     OVERLAY KEY AND DATA LENGTHS
64A8 0E 01 64B9 7015       1945        ALC   MOV1+5(2),ONE
64AE 0C 02 0000 524D       1946 MVC10  MVC   *-*(3),X256
64B4 0C 09 6449 0000       1947 MOV1   MVC   DDCFE(10),*-*           STORE DDCF IN ALTERNATE PLACE
64BA 0C 01 6587 64B9       1948        MVC   MOV2+3(2),MOV1+5      OVERLAY MOVE INSTRUCTION
                           1949
64C0 78 20 00              1950        TBN   0(,XR1),X'20'         IS IT SCAN READ REQUEST?
64C3 C0 10 65A8            1951        BT    SCANRD
                           1952
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1953 *                                                                             *
                         1954 *          THIS SECTION OVERLAYS I/O INSTRUCTIONS FOR CORRECT DRIVE           *
                         1955 *                                                                             *
                         1956
64C7 0C 00 653E 6419     1957        MVC   SIO1+1(1),DRIVE#      OVERLAY SIO INSTRUCTION
64CD 0C 00 653B 6419     1958        MVC   SIO5+1(1),DRIVE#      OVERLAY SIO INST
64D3 0C 00 6541 6419     1959        MVC   TIO4+1(1),DRIVE#      OVERLAY TIO INST
64D9 3A 02 6541          1960        SBN   TIO4+1,X'02'
64DD 0C 00 657E 6419     1961        MVC   SIO7+1(1),DRIVE#      OVERLAY SIO INST
64E3 0C 00 6581 6419     1962        MVC   TIO5+1(1),DRIVE#      OVERLAY TIO INST
64E9 3A 01 6581          1963        SBN   TIO5+1,X'01'
64ED 0C 00 6537 6419     1964        MVC   TIO1+1(1),DRIVE#      OVERLAY TIO INST
64F3 0C 00 6545 6419     1965        MVC   TIO7+1(1),DRIVE#      OVERLAY TIO INST
                         1966
64F9 78 40 00            1967        TBN   0(,XR1),X'40'         SEE  IF READ OR WRITE REQUEST
64FC F2 10 07            1968        JT    *+10
64FF 3A 01 653E          1969        SBN   SIO1+1,X'01'          OVERLAY FOR READ
6503 F2 87 2A            1970        J     RTRY1                 JUMP IF WRITE
6506 3A 02 653E          1971        SBN   SIO1+1,X'02'          OVERLAY FOR WRITE
650A 0C 01 656F 64B9     1972        MVC   CLI1+3(2),MOV1+5      OVERLAY CLI INST
6510 0C 01 6558 64B9     1973        MVC   MOV3+3(2),MOV1+5      OVERLAY MVC INST
6516 0C 00 655F 6538     1974        MVC   SIO8+1(1),SIO5+1      OVERLAY SIO INST
651C 0C 00 6562 6538     1975        MVC   SIO9+1(1),SIO5+1      OVERLAY SIO INST
6522 3A 01 6562          1976        SBN   SIO9+1,X'01'          FURTHER OVERLAY SIO INST
6526 0C 00 6565 6419     1977        MVC   TIO8+1(1),DRIVE#      OVERLAY TIO INST
652C 3A 02 6565          1978        SBN   TIO8+1,X'02'
                         1979
                      6530 1980 RTRY1  EQU   *
                         1981
                         1981
6530 71 C4 02            1982        LIO   2(,XR1),DDDR          LOAD DISK DRIVE DATA REGISTER
6533 71 C6 04            1983        LIO   4(,XR1),DDCR          LOAD DISK DRIVE CONTROL REGISTER
                         1984
6536 C1 00 6772          1985 TIO1   TIO   HALT1,*-*             TEST FOR DEVICE NOT READY
653A F3 00 00            1986 SIO5   SIO   X'00',*-*             SEEK
                         1987
                      653D 1988 DRTRN2 EQU   *
                         1989
653D F3 00 00            1990 SIO1   SIO   X'00',*-*             READ OR WRITE N RECORDS
6540 C1 00 6540          1991 TIO4   TIO   *,*-*                 TEST FOR ADAPTER NOT BUSY
6544 C1 00 67CC          1992 TIO7   TIO   HALT2,*-*             TEST FOR NOT READY DURING INST
                         1993
6548 38 02 653E          1994        TBN   SIO1+1,X'02'          IS IT WRITE INST?
654C F2 90 97            1995        JF    WINRWT                IF NOT, RETURN TO CALLER
                         1996
654F 0C 00 6569 6419     1997        MVC   TIO19+1(1),DRIVE#     OVERLAY TIO
6555 0C 09 0000 6449     1998 MOV3   MVC   *-*(10),DDCFE
6558 71 C4 02            1999        LIO   2(,XR1),DDDR          RELOAD DDDR
655E F3 00 00            2000 SIO8   SIO   0,*-*                 SEEK
                      6561 2001 DRTRN3 EQU   *
6561 F3 00 03            2002 SIO9   SIO   3,*-*                 READ VERIFY
6564 C1 00 6564          2003 TIO8   TIO   *,*-*                 WAIT TILL DRIVE NOT BUSY
6568 C1 00 65A0          2004 TIO19  TIO   CHK1,*-*              UNIT CHECK?
656C 3D FF 0000          2005 CLI1   CLI   *-*,X'FF'             SUCCESSFUL READ VERIFY?
6570 F2 81 73            2006        JE    WINRWT
                         2007
6573 0F 00 6468 7015     2008 BRTRY1 SLC   ICTR(1),ONE           IS THIS THE 10TH TIME?
6579 C0 81 675A          2009        BZ    EE2                   IF YES GO TO END ROUTINE
657D F3 00 01            2010 SIO7   SIO   X'01',*-*             RECALIBRATE
6580 C1 00 6580          2011 TIO5   TIO   *,*-*                 WAIT FOR SEEK NOT BUSY
6584 0C 09 0000 6449     2012 MOV2   MVC   *-*(10),DDCFE         RELOAD DDCF FIELD
                         2013
658A 7D 20 00            2014        CLI   0(,XR1),X'20'         IS IT A SCAN READ?
658D F2 81 3E            2015        JE    TIO9-6                IF SO, RETURN TO THAT SECTION
6590 38 FF 66AA          2016        TBN   WRTVFY,X'FF'          IS IT WRITE VERIFY?
6594 3B FF 66AA          2017        SBF   WRTVFY,X'FF'
6598 C0 10 6555          2018        BT    MOV3                  IF SO, THAN RETURN TO THAT SECTION
659C C0 87 6530          2019        B     RTRY1                 RETRY DISK OPERATION
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          2020
  65A0 3C FF 66AA         2021 CHK1   MVI   WRTVFY,X'FF'
  65A4 C0 87 67CC         2022        B     HALT2
                          2023
                          2023
                          2023
  65A8 0C 00 65DC 6419    2024 SCANRD MVC   SIO10+1(1),DRIVE#     OVERLAY SIO INSTR
  65AE 3A 03 65DC         2025        SBN   SIO10+1,X'03'
  65B2 0C 00 65D9 6419    2026        MVC   SIO11+1(1),DRIVE#     OVERLAY SIO INST
  65B8 0C 00 65D5 6419    2027        MVC   TIO9+1(1),DRIVE#      OVERLAY TIO INSTR
  65BE 0C 00 65DF 6419    2028        MVC   TIO10+1(1),DRIVE#     OVERLAY TIO INSTR
  65C4 3A 02 65DF         2029        SBN   TIO10+1,X'02'
  65C8 0C 00 65E3 6419    2030        MVC   TIO11+1(1),DRIVE#     OVERLAY TIO INSTR
  65CE 71 C4 02           2031        LIO   2(,XR1),DDDR          LOAD DDDR
  65D1 71 C6 04           2032        LIO   4(,XR1),DDCR          LOAD DDCR
  65D4 C1 00 6772         2033 TIO9   TIO   HALT1,*-*             TEST FOR DEVICE NOT READY
  65D8 F3 00 00           2034 SIO11  SIO   X'00',*-*             SEEK
                          2035
                    65DB  2036 DRTRN1 EQU   *
  65DB F3 00 0C           2037 SIO10  SIO   X'0C',*-*             EXECUTE SCAN READ
  65DE C1 00 65DE         2038 TIO10  TIO   *,*-*                 WAIT UNTIL DONE
  65E2 C1 00 67CC         2039 TIO11  TIO   HALT2,*-*             TEST FOR UNIT CHECK
                          2040
                          2040
  65E6 35 01 71E3         2041 WINRWT L     ADDR,XR1
  65EA 3C 00 0000         2042 MVI4   MVI   *-*,0                 ZER OUT FLAG BYTE BEFORE RETURNING
  65EE C0 87 0000         2043 WINRWR B     *-*                   RETURN TO CALLER
                          2044
                          2044
                          2045 *
                          2046 *       THIS SECTION FINDS THE ALTERNATE TRACK ADDRESS SEEKS TO IT  *
                          2047 *       AND RETURNS CONTROL; OR, WHEN COMING OFF AN ALTERNATE TRACK,*
                          2048 *       IT GETS THE PROGRAM BACK TO THE RIGHT TRACK.                *
                          2049 *                                                                   *
                          2050
                          2050
  65F2 34 08 6618         2051 DEFTRK ST    DEFTKR+3,ARR          SAVE ADDRESS
  65F6 0F 00 6468 7015    2052        SLC   ICTR(1),ONE           DECREMENT LOOP COUNTER
  65FC C0 81 675A         2053        BZ    EE2                   QUIT IF 10 TIMES
  6600 3D 0D 5007         2054        CLI   DBYTE7,X'0D'          COMPARE BYTE 7
  6604 F2 81 15           2055        JE    TODTRK                IF='0D' THEN SEEK TO ALTERNATE
                          2056
  6607 0C 01 6610 65ED    2057        MVC   MVI5+3(2),MVI4+3      OVERLAY INTSTRUCTION TO ZERO DDCF
  660D 3C 00 0000         2058 MVI5   MVI   *-*,0                 FLAG BYTE.
                          2059
  6611 3D 0E 5007         2060        CLI   DBYTE7,X'0E'
  6615 F2 81 77           2061        JE    FRDTRK
  6618 C0 87 0000         2062 DEFTKR B     *-*                   RETURN TO CALLER
                          2063
  661C 0C 00 6653 6419    2064 TODTRK MVC   TIO15+1(1),DRIVE#      OVERLAY TOP ONST
  6622 0C 00 6657 6419    2065        MVC   SIO2+1(1),DRIVE#      OVERLAY SIO INST
  6628 3A 01 6657         2066        SBN   SIO2+1,X'01'
  662C 0C 00 6669 6657    2067        MVC   SIO4+1(1),SIO2+1
  6632 0C 00 665E 6419    2068        MVC   SIO3+1(1),DRIVE#      OVERLAY SIO INST
  6638 0C 01 6675 64B9    2069        MVC   MVC2+3(2),MOV1+5      PUT DDCF ADDRES IN MOVE INST
  663E 0F 01 6675 6465    2070        SLC   MVC2+3(2),D5          ADJUST ADDRESS
  6644 0C 00 6665 6653    2071        MVC   TIO2+1(1),TIO15+1
                          2072
                          2072
  664A 30 C4 644B         2073        SNS   TDDDR,DDDR            SAVE CONTENTS OF DDDR
  664E 31 C4 645F         2074        LIO   TDDDFa,DDDR           LOAD DDDR WITH TEMPORARY VALUE
  6652 C1 00 6772         2075 TIO15  TIO   HALT1,*-*              SEE IF DEVICE IS READY
  6656 F3 00 01           2076 SIO2   SIO   X'01',*-*              READ HA AND RO FIELDS
  6659 31 C6 645F         2077        LIO   TDDDFa,DDCR           CHANGE THE DDCF FOR SEEK
  665D F3 00 00           2078 SIO3   SIO   X'00',*-*              SEEK TO ALTERNATE TRACK
  6660 31 C4 645F         2079        LIO   TDDDFa,DDDR
  6664 C1 00 6772         2080 TIO2   TIO   HALT1,*-*
  6668 F3 00 01           2081 SIO4   SIO   X'01',*-*              READ HA & RO OF ALT TRACK
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  666B 71 C6 04           2082        LIO   4(,XR1),DDCR          RELOAD DDCR
  666E 31 C4 644B         2083        LIO   TDDDR,DDDR            RELOAD DDDR
  6672 0C 04 0000 6452    2084 MVC2   MVC   *-*(5),TDDDF+4        MOVE CORRECT HIGH ORDER 5 BYTES
                          2085 *                                  INTO DDCF FIELD
                          2086
  6678 7D 20 00           2087        CLI   0(,XR1),X'20'
  667B C0 81 65DB         2088        BE    DRTRN1                RETURN TO SEEK IN SCANRD SECTION
  667F 38 FF 66AA         2089        TBN   WRTVFY,X'FF'          FROM WRITE VERIFY?
  6683 3B FF 66AA         2090        SBF   WRTVFY,X'FF'          RESET FLAG
  6687 C0 10 6561         2091        BT    DRTRN3
  668B C0 87 653D         2092        B     DRTRN2                RETURN TO SEEK IN RD,WRT,OR SK SCT
                          2093
                    668F  2094 FRDTRK EQU   *
  668F 7D 20 00           2095        CLI   0(,XR1),X'20'         IS IT A SCAN READ?
  6692 C0 81 65D4         2096        BE    TIO9                  IF SO, RETURN TO THAT SECTION
  6696 38 FF 66AA         2097        TBN   WRTVFY,X'FF'          IS IT A WRITE VERIFY?
  669A 3B FF 66AA         2098        SBF   WRTVFY,X'FF'
  669E C0 10 655E         2099        BT    SIO8                  IF SO, RETURN TO THAT SECTION
  66A2 C0 87 6536         2100        B     TIO1                  RETURN TO READ OR WRITE SECTION
                          2101 *                                                                  *
                          2102 *       SENSE DIAGNOSTIC 24 BYTES SUBROUTINE                       *
                          2103 *                                                                  *
                          2104 *                                                                  *
  66A6 5000         66A7  2105 DGSNS@ DC    AL2(DGSNSB)
  66A8 0000         66A9  2106 TEM1   DC    IL2'0'
  66AA 00           66AA  2107 WRTVFY DC    IL1'0'
                          2108
  66AB 34 08 66CF         2109 SNS24  ST    SNS24R+3,ARR          SAVE ADDRESS
  66AF 30 C5 6461         2110        SNS   STATE,X'C5'           DIAGNOSTIC SENSE
  66B3 30 C4 66A9         2111        SNS   TEM1,DDDR             SAVE DDDR
  66B7 31 C4 66A7         2112        LIO   DGSNS@,DDDR           LOAD DDDR
  66BB 0C 00 66C6 6419    2113        MVC   SIO6+1(1),DRIVE#      OVERLAY INST
  66C1 3A 01 66C6         2114        SBN   SIO6+1,X'01'          CONTINUE OVERLAY
  66C5 F3 00 07           2115 SIO6   SIO   X'07',*-*             SENSE DIAGNOSTIC 24 BYTES
                          2116
  66C8 31 C4 66A9         2117        LIO   TEM1,DDDR             RELOAD DDDR
  66CC C0 87 0000         2118 SNS24R B     *-*                   RETURN TO CALLER
                          2119
                          2119
  66D0 34 08 6745         2120 SNSAP  ST    SNSAPR+3,ARR          SAVE RETURN ADDRESS
  66D4 34 01 72A3         2121        ST    TEMP6,XR1             SAVE INDEX REGISTERS
  66D8 34 02 6283         2122        ST    TEMP4,XR2
  66DC C2 01 5000         2123        LA    DGSNSB,XR1            INITIALIZE ADDRESS POINTERS
  66E0 C2 02 5019         2124        LA    DGS2B+2,XR2
                          2125 *
                          2126 *       FOLLOWING ROUTINE UNPACKS THE 24 BYTE DIAGNOSTIC READ
                          2127 *       TO BE PRINTED
                          2128 *
  66E4 3C 06 71D3         2129        MVI   CTR1,6                INITIALIZE DO LOOP COUNTERS
  66E8 3C 04 71D4         2130 LOOP13 MVI   CTR2,4
  66EC 34 01 66FA         2131 LOOP14 ST    UP1,XR1               SET UNPACK ADDRESSES
  66F0 34 02 66FC         2132        ST    UP2,XR2
  66F4 C0 87 021E         2133        B     UNPACK                TO DCP UNPACK ROUTINE
  66F8 01           66F8  2134        DC    IL1'1'
  66F9 0000         66FA  2135 UP1    DC    AL2(*-*)
  66FB 0000         66FC  2136 UP2    DC    AL2(*-*)
  66FD BC 40 01           2137        MVI   1(,XR2),C' '          INSERT BLANK BETWEEN BYTES
  6700 D2 01 01           2138        LA    1(,XR1),XR1           INCREMENT ADDRESS POINTERS
  6703 E2 02 03           2139        LA    3(,XR2),XR2
  6706 0F 00 71D4 7015    2140        SLC   CTR2(1),ONE           DECREMENT LOOP COUNTER
  670C C0 01 66EC         2141        BNZ   LOOP14
  6710 8C 02 01 729A      2142        MVC   1(3,XR2),BLANK        INSERT 4 BLANKS BETWEEN EVERY 4
                          2143 *                                  BYTES
  6715 E2 02 03           2144        LA    3(,XR2),XR2
  6718 0F 00 71D3 7015    2145        SLC   CTR1(1),ONE           DECREMENT LOOP COUNTER
  671E C0 01 66E8         2146        BNZ   LOOP13
                          2147
  6722 C0 87 021A         2148        B     PRINT                 TO DCP PRINT RTN
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   6726 02               6726 2149          DC    XL1'02'              FLAG
   6727 2D               6727 2150          DC    AL1(EDMS2-EDMS2B)    LENGTH
   6728 7371             6729 2151          DC    AL2(EDMS2)           PRINT ADDRESS
                              2152
                              2153          B     PRINT
   672A C0 87 021A       672E 2154          DC    XL1'02'              FLAG (NO HEADING)
   672E 02               672F 2155          DC    AL1(HDG1-HDG1B)      LENGTH
   672F 56               6731 2156          DC    AL2(HDG1)            ADDRESS
   6730 731F                  2157
                              2158          B     PRINT
   6732 C0 87 021A       6736 2159          DC    XL1'06'              FLAG
   6736 06               6737 2160          DC    AL1(DGSNS2-DGS2B)    LENGTH
   6737 56               6739 2161 DGPRTa   DC    AL2(DGSNS2)          ADDRESS
   6738 506D                  2162
                              2163          L     TEMP6,XR1            RESTORE INDEX REGISTERS
   673A 35 01 72A3            2164          L     TEMP4,XR2
   673E 35 02 6283            2165 SNSAPR   B     *-*                  RETURN TO CALLER
   6742 C0 87 0000            2166
                              2166
                              2167 EE1      B     PRINT                PRINT 'ADAPTER CHECK'
   6746 C0 87 021A       674A 2168          DC    XL1'C2'              FLAG
   674A C2               674B 2169          DC    AL1(ERMS1-ERMS1B)    LENGTH
   674B 15               674D 2170          DC    AL2(ERMS1)           ADDRESS
   674C 760B             674F 2171          DC    XL2'FFFF'            ID
   674E FFFF                  2172          B     HALT                 TO DCP HALT   ROUTINE
   6750 C0 87 0222       6755 2173          DC    XL2'FFFF'            FLAG
   6754 FFFF                  2174          B     LINK                 TERMINATE SECTION
   6756 C0 87 0216            2175
                              2175
                              2176 EE2      B     PRINT
   675A C0 87 021A       675E 2177          DC    XL1'C2'              FLAG
   675E C2               675F 2178          DC    AL1(EDMS1-EDMS1B)    LENGTH
   675F 25               6761 2179          DC    AL2(EDMS1)           PRINT ADDRESS
   6760 7344             6763 2180          DC    XL2'FFFE'            ID
   6762 FFFE                  2181          B     SNSAP
   6764 C0 87 66D0            2182          B     HALT                 BRANCH TO DCP HALT ROUTINE
   6768 C0 87 0222       676D 2183          DC    XL2'FFFE'            HALT ID
   676C FFFE                  2184          B     LINK                 TERMINATE SECTION
   676E C0 87 0216            2185
                              2186 *
                              2187 *
                              2188 *        DEVICE NOT READY OR ERROR SUBROUTINE
                              2189 *
                              2190
                         6772 2191 HALT1    EQU   *
   6772 34 08 67C8            2192          ST    HALT1R+3,ARR         STORE RETURN ADDRESS
   6776 0F 01 67CB 7010       2193          SLC   HALT1R+3(2),FOUR     RETURN TO TIO INSTRUCTION THAT
                              2194 *                                   CALLED IT
   677C C0 87 66AB            2195          B     SNS24                SENSE DIAGNOSTIC 24 BYTES
   6780 38 10 6460            2196 HALT1A   TBN   STATE-1,X'10'        CHECK DO SEE WHAT DRIVE UNIT CHECK
   6784 F2 90 04              2197          JF    *+7                  OCCURRED AND PUT IT IN MESSAGE
   6787 3C F4 75DE            2198          MVI   ERMSG-24,C'4'
   678B 38 20 6460            2199          TBN   STATE-1,X'20'
   678F F2 90 04              2200          JF    *+7
   6792 3C F3 75DE            2201          MVI   ERMSG-24,C'3'
   6796 38 40 6460            2202          TBN   STATE-1,X'40'
   679A F2 90 04              2203          JF    *+7
   679D 3C F2 75DE            2204          MVI   ERMSG-24,C'2'
   67A1 38 80 6460            2205          TBN   STATE-1,X'80'
   67A5 F2 90 04              2206          JF    *+7
   67A8 3C F1 75DE            2207          MVI   ERMSG-24,C'1'
   67AC 38 01 6461            2208          TBN   STATE,X'01'          IS IOP HALTED?
   67B0 C0 10 6746            2209          BT    EE1
   67B4 C0 87 021A            2210          B     PRINT                TO DCP PRINT ROUTINE
   67B8 C6               67B8 2211          DC    XL1'C6'              FLAG
   67B9 24               67B9 2212          DC    AL1(ERMSG-ERMSGB)    LENGTH
   67BA 75F6             67BB 2213          DC    AL2(ERMSG)           MESSAGE ADDRESS
   67BC FFFC             67BD 2214          DC    XL2'FFFC'            HEADING
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              2215
   67BE C0 87 66D0            2216          B     SNSAP                PRINT WHAT YOU HAVE SENSED
                              2217
   67C2 C0 87 0222            2218          B     HALT                 TO DCP HALT ROUTINE
   67C6 FFFC             67C7 2219          DC    XL2'FFFC'            HEADING
                              2220
   67C8 C0 87 0000            2221 HALT1R   B     *-*                  RETURN TO CALLER
                              2222
                              2222
                              2222
                              2222
                         67CC 2223 HALT2    EQU   *
   67CC C0 87 66AB            2224          B     SNS24
   67D0 38 01 6461            2225          TBN   STATE,X'01'          CHECK IF ANY CHECKS OCCURRED
   67D4 C0 10 6746            2226          BT    EE1
                              2227
   67D8 39 02 5000            2228          TBF   DBYTE0,TRKCC         SEE IF DEFECTIVE TRACK. IF IT IS
   67DC 39 01 5001            2229          TBF   DBYTE1,OPINCP
   67E0 C0 90 65F2            2230          BF    DEFTRK               THEN READ ALTERNATE TRACK LOCATION,
                              2231 *                                   SEEK TO IT, AND CONTINUE OPERATION.
                              2232
   67E4 39 25 5000            2233          TBF   DBYTE0,X'25'         IF ANY OF THESE
   67E8 39 1C 5001            2234          TBF   DBYTE1,X'1C'             BITS ARE ON
   67EC 39 78 5002            2235          TBF   DBYTE2,X'78'                 THEN RETRY OPERATION
   67F0 C0 90 6573            2236          BF    BRTRY1
                              2237
                              2237
   67F4 0C 01 67CB 6474       2238          MVC   HALT1R+3(2),LINKMa   AFTER HALT1, TERMINATE SECTION
   67FA C0 87 6780            2239          B     HALT1A               PRINT 'DEVICE NOT READY OR CHECK'
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              2241 *
                              2242 * MAIN OPTION MENU
                              2243 *
                         67FD 2244 MENU1  EQU   *-1
   67FE C5D5E3C5D940E3C8 6820 2245 MENU11 DC    CL35'ENTER THE NUMBER OF OPTION DESIRED:'
   6806 C540D5E4D4C2C5D9      2245
   680E 40D6C640D6D7E3C9      2245
   6816 D6D540C4C5E2C9D9      2245
   681E C5C47A                2245
                         6820 2246 MENU1A EQU   *-1
   6821 F1404040D2C5E8D7 682C 2247 MENU12 DC    CL12'1   KEYPUNCH'
   6829 E4D5C3C8              2247
                         682C 2248 MENU1B EQU   *-1
   682D F2404040C4E4D7D3 6849 2249 MENU13 DC    CL29'2   DUPLICATE 80 COLUMN DECKS'
   6835 C9C3C1E3C540F8F0      2249
   683D 40C3D6D3E4D4D540      2249
   6845 C4C5C3D2E2            2249
                         6849 2250 MENU1C EQU   *-1
   684A F3404040E5E3D6C3 6856 2251 MENU14 DC    CL13'3   VTOC DUMP'
   6852 40C4E4D4D7            2251
                         6856 2252 MENU1D EQU   *-1
   6857 F4404040C4C9E2D2 6863 2253 MENU15 DC    CL13'4   DISK DUMP'
   685F 40C4E4D4D7            2253
                         6863 2254 MENU1E EQU   *-1
   6864 F5404040D7E4D5C3 6886 2255 MENU16 DC    CL35'5   PUNCH PROGRAMS RESIDING ON DISK'
   686C C840D7D9D6C7D9C1      2255
   6874 D4E240D9C5E2C9C4      2255
   687C C9D5C740D6D540C4      2255
   6884 C9E2D2                2255
                         6886 2256 MENU1F EQU   *-1
   6887 F6404040D7C1E3C3 68A4 2257 MENU17 DC    CL30'6   PATCH/DISPLAY DISK RECORDS'
   688F C861C4C9E2D7D3C1      2257
   6897 E840C4C9E2D240D9      2257
   689F C5C3D6D9C4E2          2257
                         68A4 2258 MENU1G EQU   *-1
   68A5 F9404040E3C5D9D4 68BA 2259 MENU18 DC    CL22'9   TERMINATES SECTION'
   68AD C9D5C1E3C5E240E2      2259
   68B5 C5C3E3C9D6D5          2259
                         68BA 2260 MENU1H EQU   *-1
   68BB C4C9E2D240C961D6 68DA 2261 MENU19 DC    CL32'DISK I/O ON D1-SET SSW22 FOR D2.'
   68C3 40D6D540C4F160E2      2261
   68CB C5E340E2E2E6F2F2      2261
   68D3 40C6D6D940C4F248      2261
                         68DA 2262 MENU1I EQU   *-1
   68DB C5D5E3C5D940D6D7 6902 2263 MENU10 DC    CL40'ENTER OPTION NUMBER & PRESS -END- KEY.  '
   68E3 E3C9D6D540D5E4D4      2263
   68EB C2C5D9405040D7D9      2263
   68F3 C5E2E24060C5D5C4      2263
   68FB 6040D2C5E84B4040      2263
   6903 E6D9C9E3C5      6907  2264 WRITE  DC    CL5'WRITE'
                              2265 *
                              2266 * ERROR DISPLAY FOR MENU1
                              2267 *
   6908 60606040C5D9D9D6 692D 2268 ERR1   DC    CL38'--- ERROR ---        RE-ENTER OPTION. '
   6910 D9406060604040 40     2268
   6918 40404D4040D9C560      2268
   6920 C5D5E3C5D940D6D7      2268
   6928 E3C9D6D54B40          2268
   692E 60606040C5D9D9D6 6953 2269 ERR2   DC    CL38'--- ERROR ---   RE-ENTER LINE NUMBER. '
   6936 D9406060604040 40     2269
   693E D9C560C5D5E3C5D9      2269
   6946 40D3C9D5C540D5E4      2269
   694E D4C2C5D94B40          2269
                              2270 *
                              2271 * DISK DUMP MENU
                              2272 *
                         6953 2273 MENU21 EQU   *-1
   6954 5C5C40C4C9E2D240 6962 2274 MENU2A DC    CL15'** DISK DUMP **'
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   695C C4E4D4D7405C5C        2274
                         6962 2275 MENU2  EQU   *-1
   6963 C5D5E3C5D940D6D5 6985 2276 MENU20 DC    CL35'ENTER ONE OF THE FOLLOWING OPTIONS:'
   696B C540D6C640E3C8C5      2276
   6973 40C6D6D3D3D6E6C9      2276
   697B D5C740D6D7E3C9D6      2276
   6983 D5E27A                2276
                         6985 2277 INFOA  EQU   *-1
   6986 C5D5E3C5D940E3C8 69A0 2278 INFO1  DC    CL27'ENTER THE CHANGE DATA HERE:'
   698E C540C3C8C1D5C7C5      2278
   6996 40C4C1E3C140C8C5      2278
   699E D9C57A                2278
                         69A0 2279 INFOB  EQU   *-1
   69A1 C9C640E4E2C9D5C7 69CE 2280 INFO2  DC    CL46'IF USING THE 5471,THE SPACE BAR WILL LEAVE THE'
   69A9 40E3C8C540F5F4F7      2280
   69B1 F16BE3C8C540E2D7      2280
   69B9 C1C3C540C2C1D940      2280
   69C1 E6C9D3D340D3C5C1      2280
   69C9 E5C540E3C8C5          2280
                         69CE 2281 INFOC  EQU   *-1
   69CF C4C1E3C140E4D5C3 69FE 2282 INFO3  DC    CL48'DATA UNCHANGED. PRESS -END- WHEN DONE ENTERING. '
   69D7 C8C1D5C7C5C44B40      2282
   69DF D7D9C5E2E24060C5      2282
   69E7 D5C46040E6C8C5D5      2282
   69EF 40C4D6D5C540C5D5      2282
   69F7 E3C5D9C9D5C74B46      2282
                         69FE 2283 INFOD  EQU   *-1
   69FF C9C640E4E2C9D5C7 6A30 2284 INFO4  DC    CL50'IF USING CPU DATA SWS, A HEX 40 ENTERED WILL LEAVE'
   6A07 40C3D7E440C4C1E3      2284
   6A0F C140E2E6E26B40C1      2284
   6A17 40C3C5E740F4F040      2284
   6A1F C5D5E3C5D9C5C440      2284
   6A27 E6C9D3D340D3C5C1      2284
   6A2F E5C5                  2284
                         6A30 2285 INFOE  EQU   *-1
   6A31 E3C8C540C4C1E3C1 6A64 2286 INFO5  DC    CL52'THE DATA UNCHANGED. THE STIK LITS WILL INCREMENT BY '
   6A39 40E4D5C3C8C1D3C7      2286
   6A41 C5C44B40E3C8C540      2286
   6A49 E2E3C9D240D3C9E3      2286
   6A51 E240E6C9D3D340C9      2286
   6A59 D5C3D9C5D4C5D5E3      2286
   6A61 40C2E840              2286
                         6A64 2287 INFOF  EQU   *-1
   6A65 D6D5C540C6D6D940 6A92 2288 INFO6  DC    CL46'ONE FOR EACH ENTRY. ENTER THE CHANGE DATA IN  '
   6A6D C5C1C3C840C5D5E3      2288
   6A75 D9E84B40C5D5E3C5      2288
   6A7D D940E3C8C540C3C8      2288
   6A85 C1D5C7C540C4C1E3      2288
   6A8D C140C9D54040          2288
                         6A92 2289 INFOG  EQU   *-1
   6A93 C3D7E440C4C1E3C1 6AAA 2290 INFO7  DC    CL24'CPU DATA SWITCHES 3 + 4.'
   6A9B 40E2E6C9E3C3C8C5      2290
   6AA3 E240F3404E40F44B      2290
                         6AAA 2291 MENU22 EQU   *-1
   6AAB F16060C4C9E2D240 6AB6 2292 MENU2B DC    CL12'1--DISK DUMP'
   6AB3 C4E4D4D7              2292
                         6AB6 2293 MENU23 EQU   *-1
   6AB7 F36060C3D6D5E3C9 6AC7 2294 MENU2C DC    CL17'3--CONTINUES DUMP'
   6ABF D5E4C5E240C4E4D4      2294
   6AC7 D7                    2294
                         6AC7 2295 MENU24 EQU   *-1
   6AC8 F96060D9C5E3E4D9 6ADF 2296 MENU2D DC    CL24'9--RETURNS TO MAIN MENU '
   6ADD D5E240E3D640D4C1      2296
   6AD8 C9D540D4C5D5E440      2296
                         6ADF 2297 MENU25 EQU   *-1
   6AE0 C5D5E3C5D940C3C3 6B07 2298 MENU2E DC    CL40'ENTER CC - CYLINDER IN HEX  (0 TO 21)   '
   6AE8 406040C3E3D3C9D5      2298
   6AF0 C4C5D940C9D540C8      2298
```

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   6AF8 C5E740404DF040E3       2298
   6B00 D640F2F15D404040       2298
                         6B07  2299 MENU26 EQU   *-1
   6B08 404040404040C8C5 6B2F  2300 MENU2F DC    CL40'      HH - HEAD IN HEX      (0 TO 13)   '
   6B10 406040C8C5C1C440       2300
   6B18 C9D540C8C5E74040       2300
   6B20 404040404DF040E3       2300
   6B28 D640F1F35D404040       2300
                         6B2F  2301 MENU27 EQU   *-1
   6B30 404040404040D9D9 6B57  2302 MENU2G DC    CL40'      RR - RECORD IN HEX    (1 TO 30)   '
   6B38 406040D9C5C3D6D9       2302
   6B40 C440C9D540C8C5E7       2302
   6B48 404040404DF140E3       2302
   6B50 D640F3F05D404040       2302
                         6B57  2303 MENU28 EQU   *-1
   6B58 404040404040D540 6B7F  2304 MENU2H DC    CL40'      N  - # TO DUMP(DEFAULT 1; MAX 999)'
   6B60 4060407B40E3D640       2304
   6B68 C4E4D4D74DC4C5C6       2304
   6B70 C1E4D3E340F15E40       2304
   6B78 D4C1E740F9F9F95D       2304
                         6B7F  2305 MENU29 EQU   *-1
   6B80 C3C3C8C8D9D940D5 6BA8  2306 MENU2I DC    CL41'CCHHRR NNN<-- ENTER CCHHRRN AND PRESS END'
   6B88 D5D54C606040C5D5       2306
   6B90 E3C5D940C3C3C8C8       2306
   6B98 D9D9D540C1D5C440       2306
   6BA0 D7D9C5E2E240C5D5       2306
   6BA8 C4                     2306
                         6BA8  2307 MENU55 EQU   *-1
   6BA9 C3C3C8C8D9D94040 6BD0  2308 MENU2J DC    CL40'CCHHRR     <-- ENTER CCHHRR AND PRESS END'
   6BB1 40404C606040C5D5       2308
   6BB9 E3C5D940C3C3C8C8       2308
   6BC1 D9D940C1D5C440D7       2308
   6BC9 D9C5E2E240C5D5C4       2308
                         6BD0  2309 MENU41 EQU   *-1
   6BD1 C4C9E2D240D7C1E3 6BF9  2310 MENU4A DC    CL41'DISK PATCH/DISPLAY--ENTER OPTION DESIRED:'
   6BD9 C3C861C4C9E2D7D3       2310
   6BE1 C1E86060C5D5E3C5       2310
   6BE9 D940D6D7E3C9D6D5       2310
   6BF1 40C4C5E2C9D9C5C4       2310
   6BF9 7A                     2310
                         6BF9  2311 MENU42 EQU   *-1
   6BFA F16060C4C9E2D240 6C0E  2312 MENU4B DC    CL21'1--DISK PATCH/DISPLAY'
   6C02 D7C1E3C3C861C4C9       2312
   6C0A E2D7D3C1E8             2312
                         6C0E  2313 MENU43 EQU   *-1
   6C0F F96060D9C5E3E4D9 6C25  2314 MENU4C DC    CL23'9--RETURN TO MAIN MENU'
   6C17 D540E3D640D4C1C9       2314
   6C1F D540D4C5D5E440         2314
                         6C25  2315 MENU5  EQU   *-1
   6C26 E3C8C9E240D6D7E3 6C47  2316         DC    CL34'THIS OPTION ALLOWS A PROGRAM TO BE'
   6C2E C9D6D540C1D3D3D6       2316
   6C36 E6E240C140D7D9D6       2316
   6C3E C7D9C1D440E3D640       2316
   6C46 C2C5                   2316
   6C48 40D7E4D5C3C8C5C4 6C5E  2317 MENU5A DC    CL23' PUNCHED FROM THE DISK.'
   6C50 40C6D9D6D440E3C8       2317
   6C58 C540C4C9E2D24B         2317
                         6C5E  2318 MENU52 EQU   *-1
   6C5F C5D5E3C5D940D6D5 6C81  2319 MENU5B DC    CL35'ENTER ONE OF THE FOLLOWING OPTIONS:'
   6C67 C540D6C640E3C8C5       2319
   6C6F 40C6D6D3D3D6E6C9       2319
   6C77 D5C740D6D7E3C9D6       2319
   6C7F D5E27A                 2319
                         6C81  2320 MENU53 EQU   *-1
   6C82 F1606040E3D640C5 6C98  2321 MENU5C DC    CL23'1-- TO ENTER PROGRAM ID'
   6C8A D5E3C5D940D7D9D6       2321
   6C92 C7D9C1D440C9C4         2321
                         6C98  2322 MENU54 EQU   *-1
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D443 S/3 3340 AND CARD UTILITIES --- MOD 12

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   6C99 F9606040E3D640D9 6CAF  2323 MENU5D DC    CL23'9-- TO RETURN MAIN MENU'
   6CA1 C5E3E4D9D540D4C1       2323
   6CA9 C9D540D4C5D5E4         2323
                         6CAF  2324 MENU51 EQU   *-1
   6CB0 D7C9C44040404C60 6CC8  2325 MENU5E DC    CL25'PID   <--ENTER PROGRAM ID'
   6CB8 60C5D5E3C5D940D7       2325
   6CC0 D9D6C7D9C1D440C9       2325
   6CC8 C4                     2325
                         6CC8  2326 MENU56 EQU   *-1
   6CC9 C5D5E3C5D940D7C9 6CF0  2327         DC    CL40'ENTER PID IN DATA SWITCHES 2, 3 AND 4. '
   6CD1 C440C9D540C4C1E3       2327
   6CD9 C140E2E6C9E3C3C8       2327
   6CE1 C5E240F26B40F340       2327
   6CE9 C1D5C440F44B4040       2327
   6CF1 D9C5E2C5E340E3C8 6D0B  2328 MENU5F DC    CL27'RESET THE HALT TO CONTINUE.'
   6CF9 C540C8C1D3E340E3       2328
   6D01 D640C3D6D5E3C9D5       2328
   6D09 E4C54B                 2328
                         6D0B  2329 MENU61 EQU   *-1
   6D0C C5D5E3C5D940E3C8 6D24  2330 MENU6A DC    CL25'ENTER THE DESIRED OPTION:'
   6D14 C540C4C5E2C9D9C5       2330
   6D1C C440D6D7E3C9D6D5       2330
   6D24 7A                     2330
                         6D24  2331 MENU62 EQU   *-1
   6D25 F1E7E76060E7E7C9 6D43  2332 MENU6B DC    CL31'1XX--XXIS THE LINE TO BE ALTER'
   6D2D E240E3C8C540D3C9       2332
   6D35 D5C540E3D640C2C5       2332
   6D3D 40C1D3E3C5D940         2332
                         6D43  2333 MENU63 EQU   *-1
   6D44 F36060E6D9C9E3C5 6D5A  2334 MENU6C DC    CL23'3--WRITE RECORD TO DISK'
   6D4C 40D9C5C3D6D9C440       2334
   6D54 E3D640C4C9E2D2         2334
                         6D5A  2335 MENU64 EQU   *-1
   6D5B F66060C4C9E2D7D3 6D7C  2336 MENU6D DC    CL34'6--DISPLAY NEXT SEQUENTIAL RECORD'
   6D63 C1E840D5C5E7E340       2336
   6D6B E2C5D8E4C5D5E3C9       2336
   6D73 C1D340D9C5C3D6D9       2336
   6D7B C440                   2336
                         6D7C  2337 MENU65 EQU   *-1
   6D7D F96060D9C5E3E4D9 6D92  2338 MENU6E DC    CL22'9--RETURN TO MAIN MENU'
   6D85 D540E3D640D4C1C9       2338
   6D8D D540D4C5D5E4           2338
   6D93 C5D5E3C5D940E3C8 6DB8  2339         DC    CL38'ENTER THE OPTION IN THE RIGHT MOST CPU'
   6D9B C540D6D7E3C9D6D5       2339
   6DA3 40C9D540E3C8C540       2339
   6DAB D9C9C7C8E340D4D6       2339
   6DB3 E2E340C3D7E4           2339
   6DB9 40C4C1E3C140E2E6 6DD8  2340 MENU70 DC    CL32' DATA SWITCH AND RESET THE HALT.'
   6DC1 C9E3C3C840C1D5C4       2340
   6DC9 40D9C5E2C5E340E3       2340
   6DD1 C8C540C8C1D3E348       2340
                         6DD8  2341 MENU71 EQU   *-1
   6DD9 E4E2C540C3D7E440 6DFC  2342 MENU7A DC    CL36'USE CPU DATA SWS FOR ENTERING DATA: '
   6DE1 C4C1E3C140E2E6E2       2342
   6DE9 40C6D6D940C5D5E3       2342
   6DF1 C5D9C9D5C740C4C1       2342
   6DF9 E3C17A40               2342
                         6DFC  2343 MENU72 EQU   *-1
   6DFD C3C360C5D5E3C5D9 6E17  2344 MENU7B DC    CL27'CC-ENTER IN DATA SWS 1 + 2 '
   6E05 40C9D540C4C1E3C1       2344
   6E0D 40E2E6E240F1404E       2344
   6E15 40F240                 2344
                         6E17  2345 MENU73 EQU   *-1
   6E18 C8C860C5D5E3C5D9 6E44  2346 MENU7C DC    CL45'HH-ENTER IN DATA SWS 3 + 4 AND RESET HALT E3.'
   6E20 40C9D540C4C1E3C1       2346
   6E28 40E2E6E240F3404E       2346
   6E30 40F440C1D5C440D9       2346
   6E38 C5E2C5E340C8C1D3       2346
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   6E40 E340C5F34B            2346
                        6E44  2347 MENU74 EQU   *-1
   6E45 D9D960C5D5E3C5D9 6E71 2348 MENU7D DC    CL45'RR-ENTER IN DATA SWS 1 + 2 AND RESET HALT E4.'
   6E4D 40C9D540C4C1E3C1      2348
   6E55 40E2E6E240F1404E      2348
   6E5D 40F240C1D5C440D9      2348
   6E65 C5E2C5E340C8C1D3      2348
   6E6D E340C5F44B            2348
                        6E71  2349 MENU75 EQU   *-1
   6E72 D5D5D560C5D5E3C5 6EA1 2350 MENU7E DC    CL48'NNN-ENTER IN CPU SWS 2, 3 + 4 AND RESET HALT E5.'
   6E7A D940C9D540C3D7E4      2350
   6E82 40E2E6E240F26B40      2350
   6E8A F3404E40F440C1D5      2350
   6E92 C440D9C5E2C5E340      2350
   6E9A C8C1D3E340C5F54B      2350
                        6EA1  2351 MENU76 EQU   *-1
   6EA2 C5D5E3C5D940E3C8 6ECD 2352         DC   CL44'ENTER THE OPTION IN DATA SW 2, LINE # IN DAT'
   6EAA C540D6D7E3C9D6D5      2352
   6EB2 40C9D540C4C1E3C1      2352
   6EBA 40E2E640F26B40D3      2352
   6EC2 C9D5C5407B40C9D5      2352
   6ECA 40C4C1E3              2352
   6ECE C140E2E6E240F340 6EF9 2353 MENU7F DC    CL44'A SWS 3 + 4 FOR OPTION 1 AND RESET THE HALT.'
   6ED6 4E40F440C6D6D940      2353
   6EDE D6D7E3C9D6D540F1      2353
   6EE6 40C1D5C440D9C5E2      2353
   6EEE C5E340E3C8C540C8      2353
   6EF6 C1D3E34B              2353
   6EFA D2C5E8D7E4D5C3C8 6F27 2354 ER5471 DC    CL46'KEYPUNCH NOT SUPPORTED, 5471 IS NOT DEFINED. '
   6F02 40D5D6E340E2E4D7      2354
   6F0A D7D6D9E3C5C46B40      2354
   6F12 F5F4F7F140C9E240      2354
   6F1A D5D6E340C4C5C6C9      2354
   6F22 D5C5C44B4040          2354
                        6F27  2355 KBRDYB EQU   *-1
   6F28 D9C5C1C4E860C4C9 6F3B 2356 DSKXX  DC    CL20'READY-DISK I/O ON DX'
   6F30 E2D240C961D640D6      2356
   6F38 D540C4E7              2356
                              2357
   6F3C E7E7E8E8E9E940E6 6F4D 2358 BWRT   DC    CL18'XXYYZZ WAS WRITTEN'
   6F44 C1E240E6D9C9E3E3      2358
   6F4C C5D5                  2358
   6F4E 6F53             6F4F 2359 RC00   DC    AL2(RC00a)          ADDRESS OF COMP DATA
   6F50 71EC             6F51 2360 RD00   DC    AL2(ABUF)           ADDRESS OF NON-COMP DATA      03
   6F52 0C00             6F53 2361 RC00a  DC    XL2'0C00'
   6F54 4000             6F55 2362 FUNREG DC    XL2'4000'
   6F56 007F             6F57 2363 LEN128 DC    XL2'007F'           LENGTH COUNT FOR 128 BYTES
   6F58 00               6F58 2364 CD10R2 DC    XL1'00'
   6F59 00               6F59 2365 SCDFG  DC    XL1'00'
   6F5A 0000             6F5B 2366 STATUS DC    XL2'00'
   6F5C 0000             6F5D 2367 TRANS  DC    XL2'00'
   6F5E 00               6F5E 2368 FLAG   DC    XL1'00'             FLAG BYTE:
                              2369 *                                  08 - LAST RECORD FLAG
                              2370 *                                  10 - LOADING A SYSTEM TEST MODULE
                              2371 *                                  20 - DATA DECK IS BEING READ
                              2372 *                                  80 - LOADING A TAP DECK
   6F5F F0F0F0F0         6F62 2373 SEQCTR DC    CL4'0000'
   6F63 F0F0F0F0         6F66 2374 D0     DC    CL4'0000'
   6F67 F1               6F67 2375 D1     DC    CL1'1'
   6F68 404040404040     6F6D 2376 BLNK   DC    CL6'      '
   6F6E D4C5             6F6F 2377 ME     DC    CL2'ME'
   6F70 00000000         6F73 2378 SAVEID DC    XL4'00'
   6F74 00000000         6F77 2379 LASTCD DC    XL4'00'
   6F78 D3C5D5C7E3C840C3 6F99 2380 LCROVR DC    CL34'LENGTH COUNT OVERFLO - RESTART JOB'
   6F80 D6E4D5E340D6E5C5       2380
   6F88 D9C6D3D6406040D9      2380
   6F90 C5E2E3C1D9E340D1      2380
   6F98 D6C2                  2380
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   6F9A D7C1D9C9E3E840C5 6FC2 2381 PARERR DC    CL41'PARITY ERROR - RESET 3741 AND RESTART JOB'
   6FA2 D9D9D6D9406040D9      2381
   6FAA C5E2C5E340F3F7F4      2381
   6FB2 F140C1D5C440D9C5      2381
   6FBA E2E3C1D9E340D1D6      2381
   6FC2 C2                    2381
   6FC3 F3F7F4F140C9E240 6FDF 2382 NOTIN  DC    CL29'3741 IS NOT IN THE INPUT MODE'
   6FCB D5D6E340C9D540E3      2382
   6FD3 C8C540C9D5D7E4E3      2382
   6FDB 40D4D6C4C5            2382
   6FE0 D7E4E340C9E340C9 700A 2383 PINW   DC    CL43'PUT IT IN THE INPUT MODE AND RESET THE HALT'
   6FE8 D540E3C8C540C9D5      2383
   6FF0 D7E4E340D4D6C4C5      2383
   6FF8 40C1D5C440D9C5E2      2383
   7000 C5E340E3C8C540C8      2383
   7008 C1D3E3                2383
   700B 5050             700C 2384 X80    DC    XL2'5050'           FOR 2560 READ LENGTH (80)
   700D 0004             700E 2385 X4     DC    XL2'0004'
   700F 0004             7010 2386 FOUR   DC    XL2'0004'
   7011 0003             7012 2387 THREE  DC    XL2'0003'
   7013 00               7013 2388 COUNT  DC    XL1'00'
   7014 0001             7015 2389 ONE    DC    XL2'0001'
   7016 0000             7017 2390 ZERO   DC    XL2'0000'
   7018 0000             7019 2391 NUM    DC    XL2'0000'
   701A 0000             701B 2392 STATUX DC    XL2'0'
   701C F0F0F0F1         701F 2393 F0F1   DC    XL4'F0F0F0F1'
   7020 0000             7021 2394 SECNT  DC    IL2'0'
   7022 0000000000000000 7029 2395 SEQNO  DC    8IL1'0'
   702A 00               702A 2396 EFLAG  DC    XL1'00'
   702B 00               702B 2397 ALTFLG DC    XL1'00'
   702C 00               702C 2398 COUNTR DC    XL1'00'
   702D 0000             702E 2399 CTR    DC    XL2'0'
   702F 0000             7030 2400 CTR1   DC    XL2'0'
   7031 0000             7032 2401 SAV0   DC    XL2'0000'
   7033 0000             7034 2402 SAVXR1 DC    2XL1'0'
   7035 0000             7036 2403 SAVXR2 DC    2XL1'0'
                         7037 2404 ASTLIN EQU   *
   7037 4040404040404040 7064 2405         DC    46CL1' '
   703F 4040404040404040      2405
   7047 4040404040404040      2405
   704F 4040404040404040      2405
   7057 4040404040404040      2405
   705F 404040404040          2405
   7065 4040404040404040 7087 2406         DC    CL35'          * INDICATES BYTES CHANGED'
   706D 40405C40C9D5C4C9      2406
   7075 C3C1E3C5E240C2E8      2406
   707D E3C5E240C3C8C1D5      2406
   7085 C7C5C4                2406
                         7088 2407 LINE   EQU   *
   7088 D3C9D5C5E7E74040 70D4 2408         DC    CL77'LINEXX  RECORD OF 32 BYTES IN LENGTH'
   7090 D9C5C3D6D9C440D6      2408
   7098 C640F3F240C2E8E3      2408
   70A0 C5E240C9D540D3C5      2408
   70A8 D5C7E3C840404040      2408
   70B0 4040404040404040      2408
   70B8 4040404040404040      2408
   70C0 4040404040404040      2408
   70C8 4040404040404040      2408
   70D0 4040404040            2408
   70D5 4040404040404040 70F3 2409 LINE1  DC    CL31'          ORIGINAL DATA ON DISK'
   70DD 4040D6D9C9C7C9D5      2409
   70E5 C1D340C4C1E3C140      2409
   70ED D6D540C4C9E2D2        2409
                         70F4 2410 CHGLIN EQU   *
   70F4 C3C8C740E7E74040 7121 2411         DC    CL46'CHG XX  INDICATES BYTES CHANGED          '
   70FC C9D5C4C9C3C1E3C5      2411
   7104 E240C2E8E3C5E240      2411
   710C C3C8C1D5C7C5C440      2411
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   7114 4040404040404040       2411
   711C 40404040404040         2411
   7122 4040404040404040 714E  2412         DC    CL45'          DATA AS IT WILL BE WRITTEN TO DISK'
   712A 4040C4C1E3C140C1       2412
   7132 E240C9E340E6C9D3       2412
   713A D340C2C540E6D9C9       2412
   7142 E3E3C5D540E3D640       2412
   714A C4C9E2D240             2412
   714F 40C5D5E3C5D940C1 7180  2413 KEEP    DC    CL50' ENTER A 1 IN RIGHT MOST DATA SW TO RE-ENTER DATA.'
   7157 40F140C9D540D9C9       2413
   715F C7C8E340D4D6E2E3       2413
   7167 40C4C1E3C140E2E6       2413
   716F 40E3D640D9C560C5       2413
   7177 D5E3C5D940C4C1E3       2413
   717F C148                   2413
   7181 40C5D5E3C5D940C1 7184  2414 KEEP1   DC    CL52' ENTER A 2 IN RIGHT MOST DATA SW IF DATA IS CORRECT.'
   7189 40F240C9D540D9C9       2414
   7191 C7C8E340D4D6E2E3       2414
   7199 40C4C1E3C140E2E6       2414
   71A1 40C9C640C4C1E3C1       2414
   71A9 40C9E240C3D6D9D9       2414
   71B1 C5C3E34B               2414
   71B5 40D9C5E2C5E340E3 71D0  2415 KEEP2   DC    CL28' RESET THE HALT TO CONTINUE.'
   71BD C8C540C8C1D3E340       2415
   71C5 E3D640C3D6D5E3C9       2415
   71CD D5E4C54B               2415
   71D1 5C                     71D1 2416 ASTER   DC    CL1'*'
   71D2 0000                   71D3 2417 CTR1    DC    IL2'0'
   71D4 00                     71D4 2418 CTR2    DC    IL1'0'
   71D5 F0F0F0                 71D7 2419 CHAR0   DC    XL3'F0F0F0'
   71D8 F0F1                   71D9 2420 CHAR1   DC    XL2'F0F1'
   71DA F1F7                   71DB 2421 CHAR17  DC    XL2'F1F7'
   71DC 8001                   71DD 2422 XREG    DC    XL2'8001'
   71DE 0000                   71DF 2423 WORK    DC    XL2'0'
   71E0 0003                   71E1 2424 SVPREQ  DC    XL2'0003'
   71E2 00                     71E2 2425 PUNFLG  DC    XL1'00'
   71E3 00                     71E3 2426 ADDR    DC    XL1'00'
   71E4 10                     71E4 2427 SIXTEN  DC    IL1'16'
   71E5 00C8                   71E6 2428 TWO00   DC    IL2'200'
   71E7 01E0                   71E8 2429 FOR80   DC    IL2'480'
   71E9 0DF4                   71EA 2430 BUFWRT  DC    AL2(BUFFER+500)
   71EB 0D00                   71EC 2431 ABUF    DC    AL2(BUFFER+256)
   71ED 00                     71ED 2432 NPRT    DC    XL1'00'
   71EE 59A9                   71EF 2433 APATCH  DC    AL2(DPATCH)
   71F0 531E                   71F1 2434 ADUMP   DC    AL2(DDUMP)
   71F2 D4D6E5C5               71F5 2435 MOVE    DC    CL4'MOVE'
   71F6 6150                   71F7 2436 CEND    DC    CL2'/&'
   71F8 000000000000           71FD 2437 SBYTE   DC    6IL1'0'
                               71FE 2438 DSKFLD  EQU   *
   71FE 0000000000             7202 2439         DC    5IL1'0'
   7203 000000                 7205 2440 PSBYTE  DC    3IL1'0'
   7206 00                     7206 2441 SFLG2   DC    XL1'00'
   7207 00                     7207 2442 SECFLG  DC    XL1'00'
   7208 F0F0F0F1               720B 2443 CARDNO  DC    XL4'F0F0F0F1'
   720C 00                     720C 2444 FIRST   DC    XL1'00'
   720D 00000000000000000      7220 2445 SAV20   DC    20XL1'00'
   7215 00000000000000000            2445
   721D 00000000               7221 2446 FLAGC   DC    XL1'00'
   7221 00                     7227 2447 SAV     DC    6IL1'0'
   7222 000000000000           7229 2448 TWO     DC    IL2'2'
   7228 0002                   722A 2449 STATU1  DC    XL1'00'
   722A 00                     722B 2450 CRDFLG  DC    XL1'00'
   722B 00                     00F0 2451 MFCU    EQU   X'F0'
                               00F2 2452 MFCM    EQU   X'F2'
                               0051 2453 M1442   EQU   X'51'
                               0040 2454 M3741   EQU   X'40'
   722C 0880                   722D 2455 READBF  DC    XL2'0880'
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FOLLOWING THREE EQUATES APPLY TO THE VALUES CRDFLG CAN ASSUME


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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         0A80 2456 DUMMY   EQU   READIN
   722E 0A80             722F 2457 ADUM    DC    AL2(DUMMY)
   7230 0B00             7231 2458 ACRD    DC    AL2(SAVCRD)
                         0880 2459 INPUT   EQU   X'0880'
                         021A 2460 PRINT1  EQU   X'21A'
   7232 0030             7233 2461 NUMPUN  DC    XL2'0030'
   7234 0000             7235 2462 TSTN    DC    XL2'0'
   7236 0000000000       723A 2463 SAREA   DC    XL5'0'
                         6210 2464 RECORD  EQU   LD5471
                         7235 2465 DAT     EQU   TSTN
                              2466 *
                         723B 2467 ERASE   EQU   *
   723B 4040404040404040 729A 2468 BLANK   DC    96XL1'40'
   7243 4040404040404040      2468
   724B 4040404040404040      2468
   7253 4040404040404040      2468
   725B 4040404040404040      2468
   7263 4040404040404040      2468
   726B 4040404040404040      2468
   7273 4040404040404040      2468
   727B 4040404040404040      2468
   7283 4040404040404040      2468
   728B 4040404040404040      2468
   7293 4040404040404040      2468
   729B 00               729B 2469 LWRT    DC    IL1'0'
   729C 00               729C 2470 PFLAG   DC    IL1'0'
   729D 00               729D 2471 DFLAG   DC    IL1'0'
   729E 00               729E 2472 DCPFG   DC    IL1'0'
   729F 00               729F 2473 LSTSCN  DC    IL1'0'
   72A0 0000             72A1 2474 TEMP2   DC    IL2'0'
   72A2 0000             72A3 2475 TEMP6   DC    IL2'0'
   72A4 0000             72A5 2476 TEMP7   DC    IL2'0'
   72A6 C1C3E3           72A8 2477         DC    CL3'ACT'
   72A9 00               72A9 2478 ACTO    DC    XL1'00'
   72AA 000000           72AC 2479 WORK1   DC    3XL1'0'
                         72AD 2480 VTIMB   EQU   *
   72AD C1C3E3           72AF 2481         DC    CL3'ACT'
   72B0 0000000000000000 72C9 2482 VTIM    DC    26IL1'0'
   72B8 0000000000000000      2482
   72C0 0000000000000000      2482
   72C8 0000                  2482
                         72C2 2483 SCTR    EQU   VTIMB+21
                         72C9 2484 HDG1B   EQU   *-1
   72CA F0F0404040404040 72F6 2485         DC    CL45'00        03    04        07    08        11    '
   72D2 40F0F340404040F0      2485
   72DA F4404040404040F0      2485
   72E2 F0F7404040F0F8        2485
   72EA 4040404040404F1       2485
   72F2 F140404040            2485
   72F7 F1F2404040404040 731F 2486 HDG1    DC    CL41'12        15    16        19    20        23'
   72FF 40F1F540404040F1      2486
   7307 F6404040404040F0      2486
   730F F1F9404040F0F2F0      2486
   7317 4040404040404F2       2486
   731F F3                    2486
                         731F 2487 EDMS1B  EQU   *-1
   7320 F3F3F4F040C6C1C9 7344 2488 EDMS1   DC    CL37'3340 FAILED TO EXECUTE A SIO 10 TIMES'
   7328 D3C5C440E3D640C5      2488
   7330 E7C5C3E4E3C540C1      2488
   7338 40E2C9D640F1F040      2488
   7340 E3C9D4C5E2            2488
                         7344 2489 EDMS2B  EQU   *-1
   7345 E3C8C540C9D5C6D6 7371 2490 EDMS2   DC    CL45'THE INFORMATION BELOW IS THE 24 BYTE DIAG SNS'
   734D D9D4C1E3C9D6D540      2490
   7355 C2C5D3D6E640C9E2      2490
   735D 40E3C8C540F2F440      2490
   7365 C2E8E3C540C4C9C1      2490
   736D C740E2D5E2            2490
```

****
ERASE AND BLANK MUST BE TOGETHER *
****

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    7372 C3C1D9C440D9C5C1 738F 2491 MSGCNR DC    CL30'CARD READER NOT READY OR ERROR'
    737A C4C5D940D5D6E340      2491
    7382 D9C5C1C4E840D6D9      2491
    738A 40C5D9D9D6D9          2491
    7390 5BD7E4D5C3C8     7395 2492 MSGPUN DC    CL6'$PUNCH'
    7396 5BC5D5C4         7399 2493 MSGEND DC    CL4'$END'
    739A D4C9E2E2C9D5C740 73C0 2494 MSGCNT DC    CL39'MISSING CONTROL CARD-USE $PUNCH OR $END'
    73A2 C3D6D5E3D9D6D340      2494
    73AA C3C1D9C460E4E2C5      2494
    73B2 405BD7E4D5C3C840      2494
    73BA D6D9405BC5D5C4        2494
    73C1 E4E2C540D7D9D6C7 73E8 2495 MSGDUP DC    CL40'USE PROGRAM DUP TO PUNCH 96 COLUMN DECKS'
    73C9 D9C1D440C4E4D740      2495
    73D1 E3D640D7E4D5C3C8      2495
    73D9 40F9F640C3D6D3E4      2495
    73E1 D4D540C4C5C3D2E2      2495
    73E9 40C961D640C4C5E5 7406 2496 MSGNOT DC    CL30' I/O DEVICE NOT DEFINED IN UDT'
    73F1 C9C3C540D5D6E340      2496
    73F9 C4C5C6C9D5C5C440      2496
    7401 C9D540E4C4E3          2496
    7407 E2C5E340E2E2E6F1 7428 2497         DC    CL34'SET SSW17 FOR 3741, SSW18 FOR 1442'
    740F F740C6D6D940F3F7      2497
    7417 F4F16840E2E2E6F1      2497
    741F F840C6D6D940F1F4      2497
    7427 F4F2                  2497
    7429 6B40E2E2E6F1C140 7438 2498 MSGSET DC    CL16', SSW1A FOR 5424'
    7431 C6D6D940F5F4F2F4      2498
    7439 4040404040404040 7468 2499         DC    CL48'          3741 CAN ONLY BE USED BE USED WITH THE'
    7441 4040F3F7F4F140C3      2499
    7449 C1D540D6D5D3E840      2499
    7451 C2C540E4E2C5C440      2499
    7459 C2C540E4E2C5C440      2499
    7461 E6C9E3C840E3C8C5      2499
    7469 7DD7E4D5C3C87D40 7477 2500 ONLY    DC    CL15'''PUNCH'' OPTION.'
    7471 D6D7E3C9D6D54B        2500
                          7477 2501 MSGCYB EQU   *-1
    7478 C3E8D3C9D5C4C5D9 7482 2502 MSGCY1 DC    CL11'CYLINDER XX'
    7480 40E7E7                2502
    7483 6B40C8C5C1C44040 748C 2503 MSGCY2 DC    CL10', HEAD  YY'
    748B E8E8                  2503
    748D 6B40D9C5C3D6D9C4 7497 2504 MSGCYL DC    CL11', RECORD ZZ'
    7495 40E9E9                2504
                          7498 2505 MSGSSB EQU   *
    7498 C3C3C8C8D9D9     749D 2506 MSGSS  DC    CL6'CCHHRR'
    749E C5D5E3C5D940D9C5 74B8 2507 MSGENT DC    C  'ENTER RECORD TO BE PUNCHED:'
    74A6 C3D6D9C440E3D640      2507
    74AE C2C540D7E4D5C3C8      2507
    74B6 C5C47A                2507
    74B9 D7C9C440D5D6E340 74C7 2508 MSGBAD DC    CL15'PID NOT FOUND  '
    74C1 C6D6E4D5C44040        2508
                          74C7 2509 MSINRB EQU   *-1
    74C8 C9D5E5C1D3C9C440 74F4 2510         DC    CL45'INVALID RECORD NUMBER SELECTED - VALID RECORD'
    74D0 D9C5C3D6D9C440D5      2510
    74D8 E4D4C2C5D940E2C5      2510
    74E0 D3C5C3E3C5C44060      2510
    74E8 40E5C1D3C9C440D9      2510
    74F0 C5C3D6D9C4            2510
    74F5 40D5E4D4C2C5D9E2 7508 2511 MSINRC DC    CL20' NUMBERS ARE 1 TO 30'
    74FD 40C1D9C540F140E3      2511
    7505 D640F3F0              2511
                          7508 2512 MSGSCB EQU   *-1
    7509 C9D5E5C1D3C9C440 7533 2513         DC    CL43'INVALID HEAD SELECTED - VALID HEAD NUMBERS '
    7511 C8C5C1C440E2C5D3      2513
    7519 C5C3E3C5C4406040      2513
    7521 E5C1D3C9C440C8C5      2513
    7529 C1C440D5E4D4C2C5      2513
    7531 D9E240                2513
    7534 C1D9C540F040E3D6 753E 2514 MSGSEC DC    CL11'ARE 0 TO 13'
```



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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

    753C 40F1F3                2514
    753F E3C8C9E240C4C5C3 7561 2515 MSGDCK DC    CL35'THIS DECK PUNCHED USING PROGRAM D44'
    7547 D240D7E4D5C3C8C5      2515
    754F C440E4E2C9D5C740      2515
    7557 D7D9D6C7D9C1D440      2515
    755F C4F4F4                2515
    7562 C9D5E5C1D3C9C440 758D 2516         DC    CL44'INVALID HEX NUMBER ENTERED FOR CYLINDER/HEAD'
    756A C8C5E740D5E4D4C2      2516
    7572 C5D940C5D5E3C5D9      2516
    757A C5C440C6D6D940C3      2516
    7582 E8D3C9D5C4C5D961      2516
    758A C8C5C1C4              2516
    758E 61D9C5C3D6D9C4   7594 2517 MSGHEX DC    CL7'/RECORD'
                          7594 2518 MSGTBB EQU   *-1
    7595 C9D5E5C1D3C9C440 75C6 2519         DC    CL50'INVALID CYLINDER SELECTED - VALID CYLINDER NUMBERS'
    759D C3E8D3C9D5C4C5D9      2519
    75A5 40E2C5D3C5C3E3C5      2519
    75AD C4406040E5C1D3C9      2519
    75B5 C440C3E8D3C9D5C4      2519
    75BD C5D940D5E4D4C2C5      2519
    75C5 D9E2                  2519
    75C7 40C1D9C540F040E3 75D2 2520 MSGTB  DC    CL12' ARE 0 TO 21'
    75CF D640F2F1              2520
                          75D2 2521 ERMSGB EQU   *-1
    75D3 F3F3F4F040C4D9C9 75F6 2522 ERMSG  DC    CL36'3340 DRIVE X NOT READY OR UNIT CHECK'
    75DB E5C540E740D5D6E3      2522
    75E3 40D9C5C1C4E840D6      2522
    75EB D940E4D5C9E340C3      2522
    75F3 C8C5C3D2              2522
                          75F6 2523 ERMS1B EQU   *-1
    75F7 C1C4C1D7E3C5D940 760B 2524 ERMS1  DC    CL21'ADAPTER CHECK ON 3340'
    75FF C3C8C5C3D240D6D5      2524
    7607 40F3F3F4F0            2524
                               2525 *
                               2526 *
                               2527 *      FOLLOWING TABLE CONTAINS VALUES 6 BIT CODE IS TRANSLATED
                               2528 *      TO SO THAT IT WILL BE PRINTABLE.
                               2529 *
                               2530 *
                          760C 2531 TABLE  EQU   *
    760C 40C1C2C3C4C5C6C7 7613 2532         DC    XL8'40C1C2C3C4C5C6C7'
    7614 C8C94A4B4C4D4E4F 761B 2533         DC    XL8'C8C94A4B4C4D4E4F'
    761C 50D1D2D3D4D5D6D7 7623 2534         DC    XL8'50D1D2D3D4D5D6D7'
    7624 D8D95A5B5C5D5E5F 762B 2535         DC    XL8'D8D95A5B5C5D5E5F'
    762C 6061E2E3E4E5E6E7 7633 2536         DC    XL8'6061E2E3E4E5E6E7'
    7634 E8E9D06B6C6D6E6F 763B 2537         DC    XL8'E8E9D06B6C6D6E6F'
    763C F0F1F2F3F4F5F6F7 7643 2538         DC    XL8'F0F1F2F3F4F5F6F7'
    7644 F8F97A7B7C7D7E7F 764B 2539         DC    XL8'F8F97A7B7C7D7E7F'
                               2540
                               2540
                               2540
                               2541 ***********
                               2542 * EQUATES *
                               2543 ********************************************************************************
                               2544
                               2544
                          00F1 2545 BUSY   EQU   X'F1'
                          0008 2546 FORRES EQU   X'08'
                          0043 2547 CONT1  EQU   X'43'
                          5000 2548 DBYTE0 EQU   DGSNSB
                          5001 2549 DBYTE1 EQU   DGSNSB+1
                          5002 2550 DBYTE2 EQU   DGSNSB+2
                          5007 2551 DBYTE7 EQU   DGSNSB+7
                          0002 2552 TRKCC  EQU   X'02'
                          0001 2553 OPINCP EQU   X'01'
                          00C4 2554 DDDR   EQU   X'C4'
                          00C6 2555 DDCR   EQU   X'C6'
                          00C0 2556 DR1    EQU   X'C0'
```

D443 S/3 3340 AND CARD UTILITIES --- MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         00C8 2557 DR2     EQU   X'C8'
                         00D0 2558 DR3     EQU   X'D0'
                         00D8 2559 DR4     EQU   X'D8'
                         0001 2560 XR1     EQU   01
                         0002 2561 XR2     EQU   02
                         00C0 2562 IAR1    EQU   X'C0'
                         0008 2563 ARR     EQU   X'08'
                         0020 2564 P1IAR   EQU   X'20'
                         020A 2565 SWITCH  EQU   X'20A'
                         0212 2566 TEST    EQU   X'212'
                         0232 2567 UTAB    EQU   X'232'
                         0216 2568 LINK    EQU   X'216'
                         021A 2569 PRINT   EQU   X'21A'
                         0226 2570 PACK    EQU   X'226'
                         021E 2571 UNPACK  EQU   X'21E'
                         0222 2572 HALT    EQU   X'222'
                         020C 2573 SBYTE4  EQU   X'20C'
                         0018 2574 SIOI    EQU   X'18'
                         0879 2575 CRTFLG  EQU   X'879'
                         0001 2576 SSW17   EQU   X'01'
                         0080 2577 SSW18   EQU   X'80'
                         0040 2578 SSW19   EQU   X'40'
                         0020 2579 SSW1A   EQU   X'20'
                         0080 2580 SSW20   EQU   X'80'
                         0000 2581 L1      EQU   00
                         0028 2582 L2      EQU   40
                         0050 2583 L3      EQU   80
                         0078 2584 L4      EQU   120
                         00A0 2585 L5      EQU   160
                         00C8 2586 L6      EQU   200
                         00F0 2587 L7      EQU   240
                         0118 2588 L8      EQU   280
                         0140 2589 L9      EQU   320
                         0168 2590 L10     EQU   360
                         0190 2591 L11     EQU   400
                         01B8 2592 L12     EQU   440
                         0020 2593 SSW22   EQU   X'20'
                         0010 2594 SSW23   EQU   X'10'
                         0008 2595 SSW24   EQU   X'08'
```

START IO IMMEDIATELY 32XX
LOCATION OF 32XX CRT FALF
INDICATE 3741 IS OUTPUT DEVICE
INDICATE 1442 IS INPUT DEVICE
INDICATE 2560 IS INPUT DEVICE
INDICATE MFCU IS INPUT DEVICE

D443 S/3 3340 AND CARD UTILITIES --- MOD 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              2597         TREP
                              2598 ********************************************************************************
                              2599 *************
                              2600         TREP
                              2601 *                    DIAGNOSTIC UTILITY
                              2602         TREP
                              2603 *
                              2604         TREP
                              2605 *       DISK I/O ON D1-SENSE SWITCHES 22 WILL SELECT D2
                              2606         TREP
                              2607 *       I/O DEVICE IS DEFINED VIA UDT - OTHERWISE:
                              2608         TREP
                              2609 *       SSW17-3741 OR SSW18-1442 OR SSW1A-5424
                              2610         TREP
                              2611 *       WHERE APPLICABLE, READING IS DONE FROM PRIMARY; PUNCHING FROM
                              2612 *SECONDARY  *
                              2613         TREP
                              2614 *       DATA SWITCHES ARE NUMBERED FROM LEFT TO RIGHT STARTING WITH 1.
                              2615         TREP
                              2616 ********************************************************************************
                              2617 *************
                         5081 2618         END   FMENU
```

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ABUF	A	002	71EC	2431	1426 1427 2360
ACRD	A	002	7231	2458	1425 1433 1444
ACTOK	A	005	5194	0215	0211
ACTO	A	001	72A9	2478	1809
ADDR	A	001	71E3	2426	1935* 2041
ADRCNT	A	001	5563	0509	0448* 0455 0488*
ADUM	A	002	722F	2457	1463
ADUMP	A	002	71F1	2434	0415 0497
ALTER	A	001	5BD1	1070	1055
ALTER1	A	006	5BF7	1083	1074
ALTFLG	A	001	702B	2397	
APATCH	A	002	71EF	2433	0987
ARR	C	001	0008	2563	0257 0519 0711 1295 1350 1385 1405 1536 1575 1659 1706 1770 1872 1934 2051 2109 2120 2192
AST	A	003	6308	1766	1812
ASTER	A	001	71D1	2416	1178
ASTLIN	A	001	7037	2404	1129* 1130 1130* 1176 1211
BLANK	A	001	729A	2468	0743 1148 1162 1163 1164 1201 1202 1203 1415 1439 1459 1475 2142
BLNK	A	006	6F6D	2376	
BRTRY1	A	006	6573	2008	2236
BUF@	A	002	555C	0506	0452
BUFFER	A	001	0C00	0037	0264 0267 0506 0525 0643 0645 0649 0670 0713* 0714 0714* 0716 0749 0757 0800 0817 0883* 0884* 0885 0885* 0886 0886* 0887 0887* 0995 0996 0997 0998 1087 1252 1253 1256 1257 1260 1261 1264 1265 1269 1428* 1491* 1757 2430 2431
BUFWRT	A	002	71EA	2430	
BUSY	C	001	00F1	2545	
BWRT	A	018	6F4D	2358	1275 1279 1283
CACT	A	003	5253	0276	0210
CARDNO	A	004	7208	2443	0623*
CCHHRR	A	006	5E60	1285	
CCONT	A	004	5560	0507	
CD1OR2	A	001	6F58	2364	
CEND	A	002	71F7	2436	0854
CHARO	A	003	71D7	2419	0449
CHAR1	A	002	71D9	2420	0999 1014 1071 1090 1134 1139
CHAR17	A	002	71DB	2421	1015 1073
CHGLIN	A	001	70F4	2410	1086* 1169 1182 1188 1201* 1202* 1203* 1207 1234 1235 1236 1237
CHKOP	A	004	5658	0579	0599
CHK1	A	004	65A0	2021	2004
CHNXT	A	004	5413	0413	0351
CK	A	003	6171	1585	1582
CKAGN	A	004	5E85	1306	1325 1338
CKBLK2	A	006	5FD7	1439	1432
CKM	A	003	5748	0658	0653 0656
CKSEC	A	004	6152	1575	0432 0502 0989
CLI1	A	004	656C	2005	1972*
CNVRT	A	004	57F2	0710	0690
CNVRTR	A	004	58B2	0761	0711*
COLD	A	003	5256	0277	0215
CONT	A	004	543C	0426	0417
CONTA8	A	006	62DA	1728	1716 1722
CONTE1	A	006	6358	1796	1789
CONTE5	A	004	63FC	1850	1836
CONT1	C	001	0043	2547	1511 1519 1530 1555 1565
COUNT	A	001	7013	2388	0710* 0741* 0747* 0753*
COUNTR	A	001	702C	2398	0197* 0258* 0262* 0719* 0721* 0724* 0727* 0730* 0733* 0801* 0811* 0812 0815 0821* 1576* 1590*
CRDFLG	A	001	722B	2450	0677 0778 1296* 1299* 1303* 1330* 1333* 1336* 1337 1351 1353 1406 1408 1419
CRTFLG	C	001	0879	2575	
CTR	A	002	702E	2399	0999* 1000 1014* 1015 1083* 1090* 1161* 1168 1177 1181 1187 1193* 1194
CTR1	A	002	71D3	2417	2129* 2145*
CTR11	A	002	7030	2400	1134* 1139* 1142

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
CTR2	A	001	71D4	2418	2130* 2140*
CYL@	A	001	5257	0278	0220* 0223
C3H161	A	005	62FA	1760	1779
C4HOR1	A	005	62F5	1759	1792
DAT	A	002	7235	2465	1665* 1666 1669 1674 1676 1678 1679
DATA1	A	004	5C86	1133	
DATA2	A	004	5C94	1136	1156
DATOK	A	004	602A	1463	1460
DBYTE0	A	001	5000	2548	2228 2233
DBYTE1	A	001	5001	2549	2229 2234
DBYTE2	A	001	5002	2550	2235
DBYTE7	A	001	5007	2551	2054 2060
DCPFG	A	001	729E	2472	
DDCF	A	010	6472	1930	0263* 0521* 1249* 1780* 1797* 1825* 1828* 1852*
DDCFB	A	001	6469	1929	0268 0526 1270 1784 1834 1856 1931
DDCFE	A	001	6449	1914	1947* 1998 2012
DDCFM	A	001	646E	1931	0206* 0270 0520* 1248* 1779* 1796* 1839
DDCFX	A	001	6281	1703	1710* 1713 1715* 1718 1720* 1721* 1724* 1725* 1726* 1729
DDCR	C	001	00C6	2555	1983* 2032* 2077* 2082*
DDDF	A	001	0C00	1757	1783 1786 1788 1806* 1807 1807* 1809* 1810* 1812 1814* 1815 1815* 1833 1855
DDDR	C	001	00C4	2554	1982* 1999* 2031* 2073 2074* 2079* 2083* 2111 2112* 2117*
DDUMP	A	001	531E	0313	0172 0425 0496 2434
DEC1	A	003	5250	0275	0235 0238 0434 0451 0492 0671
DEFTKR	A	004	6618	2062	2051*
DEFTRK	A	004	65F2	2051	2230
DFLAG	A	001	729D	2471	0654* 0660* 0663 0679 0686 0696 0697* 1484
DGPRT@	A	002	6739	2161	
DGSNS@	A	002	66A7	2105	2112
DGSNSB	A	001	5000	0043	2105 2123 2548 2549 2550 2551
DGSNS1	A	024	5017	0044	
DGSNS2	A	086	506D	0046	2160 2161
DGS2B	A	001	5017	0045	2124 2160
DISP	A	004	5AEF	0997	
DISP1	A	006	5AFD	1000	1018
DOAGAN	A	003	6162	1579	1591
DONE	A	001	5EB8	1327	1300 1302 1304
DOPNCH	A	006	593A	0815	0808
DORD	A	003	6276	1686	1673
DPATCH	A	001	59A9	0874	0176 1284 2433
DPUNCH	A	001	5638	0562	0174 0640 0698 0705
DRIVE#	A	001	6419	1870	1818 1875* 1879* 1957 1958 1959 1961 1962 1964 1965 1977 1997 2024 2026 2027 2028 2030 2064 2065 2068 2113
DRTRN1	A	001	65DB	2036	2088
DRTRN2	A	001	653D	1988	2092
DRTRN3	A	001	6561	2001	2091
DR1	C	001	00C0	2556	1875
DR2	C	001	00C8	2557	1879
DR3	C	001	00D0	2558	
DR4	C	001	00D8	2559	
DSEC#	A	003	52D8	0299	0235* 0238*
DSENDT	A	003	60F8	1530	
DSKFLD	A	001	71FE	2438	0520 0533 0537 0541 0548 0549 0550 0643* 0990 1610* 1611*
DSKMSG	A	004	50DC	0121	0116
DSKXX	A	020	6F3B	2356	0123 0124 1876* 1880*
DTAHDR	A	004	58B9	0762	0652
DUMMY	A	001	0A80	2456	1457* 2457
DUP	A	001	588A	0776	0168 0799
D0	A	004	6F66	2374	
D1	A	001	6F67	2375	
D3	A	002	6467	1927	1943
D443	A	001	0000	0005	
D48	A	002	62FC	1761	
D5	A	002	6465	1926	1937 1942 2070
D9	A	002	6463	1925	
ECKSEC	A	004	61BF	1612	1575*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ECRD	A	004	5EE1	1339	1295*
EDMS1	A	037	7344	2488	2178 2179
EDMS1B	A	001	731F	2487	2178
EDMS2	A	045	7371	2490	2150 2151
EDMS2B	A	001	7344	2489	2150
EERR	A	004	5F59	1394	1385* 1386*
EE1	A	004	6746	2167	2209 2226
EE2	A	004	675A	2176	2009 2053
EFLAG	A	001	702A	2396	0802* 0807* 0823
ELOD	A	004	5634	0551	0519*
END	A	001	5161	0190	0164
ENDRES	A	003	60D7	1519	
ENDRT	A	004	57CE	0696	0666 0674
END1	A	001	63F5	1846	1800
EPUN	A	004	6068	1478	1474 1526 1531
EPUN1	A	004	600B	1452	1405* 1478
ERASE	A	001	723B	2467	
EREAD	A	004	5F3B	1379	1350* 1365
ERMSG	A	036	75F6	2522	2198* 2201* 2204* 2207* 2212 2213
ERMSGB	A	001	75D2	2521	2212
ERMS1	A	021	760B	2524	2169 2170
ERMS1B	A	001	75F6	2523	2169
ERR	A	001	5F3F	1384	1358 1371 1429 1443 1465
ERRCHK	A	004	6102	1536	1508 1517
ERREP	A	004	5F1C	1371	1378
ERROR	A	004	5BE3	1075	1072
ERROR1	A	004	61D6	1623	1580 1586 1588
ERRPUN	A	004	6032	1465	1471
ERR1	A	038	692D	2268	0185 0421 0595 0920 1065
ERR2	A	038	6953	2269	1078
ERR24	A	004	5EF9	1358	1364
ER5471	A	046	6F27	2354	0843
FAS	A	003	62FF	1763	1786
FASINB	A	001	62FD	1762	1765 1792* 1793* 1794*
FASINF	A	001	6308	1764	1788* 1791* 1799 1820
FASINM	A	001	6305	1765	
FIRST	A	001	720C	2444	1410* 1417* 1472 1473*
FLAG	A	001	6F5E	2368	1489* 1524 1528*
FLAGC	A	001	7221	2446	0661* 0692* 0703* 1411 1412*
FLG1	A	001	56F0	0626	0630
FMENU	A	001	5081	0077	0214 0414 0591 0787 0816 0825 0844 0855 0914 1061 2618
FJRRES	C	001	0008	2546	1511 1519
FOR80	A	002	71E8	2429	
FOUR	A	002	7010	2386	1386 1774 2193
FRDTRK	A	001	668F	2094	2061
FSTDP	A	006	5448	0431	0406 0412
FUNREG	A	002	6F55	2362	1490
FX1	A	004	581D	0720	0722
FX2	A	004	5836	0726	0728
FX3	A	004	584F	0732	0734
F0	A	001	510C	0158	0156 0347 0585 0910
F0F1	A	004	701F	2393	0623
GET1	A	004	510D	0161	0147 1556 1566
GODOWT	A	006	5E06	1248	1057
GOLOD	A	006	553D	0497	0493
GORD80	A	004	58DA	0788	0779
GO1	A	004	56CC	0618	0605
GO2	A	004	569F	0600	0589
GO3	A	004	5678	0587	0580
GO4	A	004	567C	0588	0586
GO5	A	004	5600	0619	0617
HALT	C	G01	0222	2572	0152 0187 0343 0382 0390 0398 0423 0581 0597 0610 0638 0785 0797 0906 0922 0951 0959 1045 1067 1080 1136 1227 1322 1392 1504 1553 1563 1619 1628 1637 1647 2172 2182 2218
HALT1	A	001	6772	2191	1985 2033 2075 2080
HALT1A	A	004	6780	2196	2239

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
HALT1R	A	004	67C8	2221	2192* 2193* 2238*
HALT2	A	001	67CC	2223	1992 2022 2039
HCYL@	A	002	52C9	0293	0224
HDG1	A	041	731F	2486	2155 2156
HDG1@	A	001	72C9	2484	2155
HEAD1	A	032	52A1	0286	0201
HEAD2	A	033	52C2	0287	0205
HEX1	A	002	524A	0273	0236
HEX10	A	001	5564	0510	0488
HEX4	A	002	5562	0508	0461 0467 0473 0483
HREC@	A	002	52D2	0297	0234
HSEC@	A	002	52CE	0295	0229
HSTFLG	A	002	52E1	0303	0245
IAR1	C	001	00C0	2562	
ICTR	A	001	6468	1928	1939* 2008* 2052*
INCCL	A	006	62CA	1724	1719
INCHD	A	004	6286	1718	1714
INCRE	A	003	5C10	1089	1091
INCRE1	A	006	5C13	1090	1088
INFOA	A	001	6985	2277	1103
INFOB	A	001	69A0	2279	1107
INFOC	A	001	69CE	2281	1111
INFOD	A	001	69FE	2283	1115
INFOE	A	001	6A30	2285	1119
INFOF	A	001	6A64	2287	1123
INFOG	A	001	6A92	2289	1127
INFO1	A	027	69A0	2278	1103 1104
INFO2	A	046	69CE	2280	1107 1108
INFO3	A	048	69FE	2282	1111 1112
INFO4	A	050	6A30	2284	1115 1116
INFO5	A	052	6A64	2286	1119 1120
INFO6	A	046	6A92	2288	1123 1124
INFO7	A	024	6AAA	2290	1127 1128
INPUT	C	001	0880	2459	0629 0712 0715 0756 0818* 0852* 1414 1415* 1416* 1428 1457 1459 1475* 1476* 1491
INVCYL	A	004	61E9	1632	1602
INVREC	A	004	61FC	1641	1606 1608
INVTRK	A	004	61C3	1614	1604
IS1	A	006	548A	0447	0444
IS96	A	004	57B0	0686	0678
KBRDYB	A	001	6F27	2355	0123
KEEP	A	050	7180	2413	1216
KEEP1	A	052	71B4	2414	1221
KEEP2	A	028	71D0	2415	1226
KPMVC	A	005	5888	0750	0754
KPSNS	A	004	5FF7	1447	1449
LASTCD	A	004	6F77	2379	
LCROVR	A	034	6F99	2380	1551
LD37	A	004	60C8	1513	1509*
LD5471	A	001	6210	1658	2464
LEN128	A	002	6F57	2363	1512
LINE	A	001	7088	2407	1000* 1001* 1002 1002* 1003* 1004* 1005* 1006* 1007* 1008* 1009* 1013 1085* 1093* 1094* 1095* 1096* 1100 1159 1196* 1200
LINE1	A	031	70F3	2409	1196
LINK	C	001	0216	2568	0191 1932 2174 2184
LINKM@	A	002	6474	1932	2238
LOADD	A	004	55DD	0519	0433 0503 0648 0669 0992
LOOP1	A	005	51D9	0236	0239
LOOP13	A	004	66E8	2130	2146
LOOP14	A	004	66EC	2131	2141
LOOP4	A	004	576D	0668	0664 0694
LOOP8	A	006	63B6	1822	1842
LSTSCN	A	001	729F	2473	1817* 1829* 1841
LWRT	A	001	7298	2469	
L1	C	001	0000	2581	
L10	C	001	0168	2590	

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES					
L11	C	001	0190	2591						
L12	C	001	01B8	2592						
L2	C	001	0028	2582						
L3	C	001	0050	2583						
L4	C	001	0078	2584						
L5	C	001	00A0	2585						
L6	C	001	00C8	2586						
L7	C	001	00F0	2587						
L8	C	001	0118	2588						
L9	C	001	0140	2589						
ME	A	002	6F6F	2377						
MENU1	A	001	67FD	2244	0081					
MENU1A	A	001	6820	2246	0085					
MENU1B	A	001	682C	2248	0089					
MENU1C	A	001	6849	2250	0093					
MENU1D	A	001	6856	2252	0097					
MENU1E	A	001	6863	2254	0101					
MENU1F	A	001	6886	2256	0105					
MENU1G	A	001	68A4	2258	0109					
MENU1H	A	001	68BA	2260	0113					
MENU1I	A	001	68DA	2262	0119					
MENU10	A	040	6902	2263	0119	0120				
MENU11	A	035	6820	2245	0081	0082				
MENU12	A	012	682C	2247	0085	0086				
MENU13	A	029	6849	2249	0089	0090				
MENU14	A	013	6856	2251	0093	0094				
MENU15	A	013	6863	2253	0097	0098				
MENU16	A	035	6886	2255	0101	0102				
MENU17	A	030	68A4	2257	0105	0106				
MENU18	A	022	68BA	2259	0109	0110				
MENU19	A	032	68DA	2261	0113	0114				
MENU2	A	001	6962	2275	0323					
MENU2A	A	015	6962	2274	0319	0320				
MENU2B	A	012	6AB6	2292	0327	0328				
MENU2C	A	017	6AC7	2294	0331	0332				
MENU2D	A	024	6ADF	2296	0335	0336				
MENU2E	A	040	6B07	2298	0354	0355	0929	0930	0970	0971
MENU2F	A	040	6B2F	2300	0358	0359	0933	0934	0974	0975
MENU2G	A	040	6B57	2302	0362	0363	0937	0938	0978	0979
MENU2H	A	040	6B7F	2304	0366	0367				
MENU2I	A	041	6BA8	2306	0409	0410				
MENU2J	A	040	6BD0	2308	0982	0983				
MENU20	A	035	6985	2276	0323	0324				
MENU21	A	001	6953	2273	0319					
MENU22	A	001	6AAA	2291	0327					
MENU23	A	001	6AB6	2293	0331					
MENU24	A	001	6AC7	2295	0335					
MENU25	A	001	6ADF	2297	0354	0929	0970			
MENU26	A	001	6B07	2299	0358	0933	0974			
MENU27	A	001	6B2F	2301	0362	0937	0978			
MENU28	A	001	6B57	2303	0366					
MENU29	A	001	6B7F	2305	0409					
MENU4A	A	041	68F9	2310	0890	0891				
MENU4B	A	021	6C0E	2312	0894	0895				
MENU4C	A	023	6C25	2314	0898	0899				
MENU41	A	001	6BD0	2309	0890					
MENU42	A	001	68F9	2311	0894					
MENU43	A	001	6C0E	2313	0898					
MENU5	A	001	6C25	2315	0565					
MENU5A	A	023	6C5E	2317	0565	0566				
MENU5B	A	035	6C81	2319	0569	0570				
MENU5C	A	023	6C98	2321	0573	0574				
MENU5D	A	023	6CAF	2323	0577	0578				
MENU5E	A	025	6CC8	2325	0602	0603				
MENU5F	A	027	6D0B	2328	0608	0609				
MENU51	A	001	6CAF	2324	0602					

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES									
MENU52	A	001	6C5E	2318	0569									
MENU53	A	001	6C81	2320	0573									
MENU54	A	001	6C98	2322	0577									
MENU55	A	001	6BA8	2307	0982									
MENU56	A	001	6CC8	2326	0608									
MENU6A	A	025	6D24	2330	1021	1022								
MENU6B	A	031	6D43	2332	1025	1026								
MENU6C	A	023	6D5A	2334	1029	1030								
MENU6D	A	034	6D7C	2336	1033	1034								
MENU6E	A	022	6D92	2338	1037	1038								
MENU61	A	001	6D0B	2329	1021									
MENU62	A	001	6D24	2331	1025									
MENU63	A	001	6D43	2333	1029									
MENU64	A	001	6D5A	2335	1033									
MENU65	A	001	6D7C	2337	1037									
MENU7A	A	036	6DFC	2342	0372	0373	0941	0942						
MENU7B	A	027	6E17	2344	0376	0377	0945	0946						
MENU7C	A	045	6E44	2346	0380	0381	0949	0950						
MENU7D	A	045	6E71	2348	0388	0389	0957	0958						
MENU7E	A	048	6EA1	2350	0396	0397								
MENU7F	A	044	6EF9	2353	1043	1044								
MENU70	A	032	6DD8	2340	0151	0342	0905							
MENU71	A	001	6DD8	2341	0372	0941								
MENU72	A	001	6DFC	2343	0376	0945								
MENU73	A	001	6E17	2345	0380	0949								
MENU74	A	001	6E44	2347	0388	0957								
MENU75	A	001	6E71	2349	0396									
MENU76	A	001	6EA1	2351	1043									
MFCM	C	001	00F2	2452										
MFCU	C	001	00F0	2451	0778	1299	1336	1406						
MINUS1	A	002	5071	0053										
MODSIO	A	003	5F20	1372	1374*	1461*								
MOVE	A	004	71F5	2435										
MOV1	A	006	64B4	1947	1940*	1941	1942*	1943*	1944	1945*	1948	1972	1973	2069
MOV2	A	006	6584	2012	1948*									
MOV3	A	006	6555	1998	1973*	2018								
MSGBAD	A	015	74C7	2508	0622*	0636								
MSGCNR	A	030	738F	2491	1390									
MSGCNT	A	039	73C0	2494	0795									
MSGCYB	A	001	7477	2501	0545									
MSGCYL	A	011	7497	2504	0542	0545	0546							
MSGCY1	A	011	7482	2502	0534									
MSGCY2	A	010	748C	2503	0538									
MSGDCK	A	035	7561	2515	0702									
MSGDUP	A	040	73E8	2495	0783									
MSGEND	A	004	7399	2493	0805									
MSGENT	A	027	74B8	2507	0848									
MSGHEX	A	007	7594	2517	1626									
MSGNOT	A	030	7406	2496	1312									
MSGPUN	A	006	7395	2492	0790									
MSGSCB	A	001	7508	2512	1616									
MSGSEC	A	011	753E	2514	1616	1617								
MSGSET	A	016	7438	2498	1317									
MSGSS	A	006	749D	2506										
MSGSSB	A	001	7498	2505	0986*									
MSGTB	A	012	75D2	2520	1634	1635								
MSGTBB	A	001	7594	2518	1634									
MSINRB	A	001	74C7	2509	1643									
MSINRC	A	020	7508	2511	1643	1644								
MVC	A	004	588D	0751	0750*									
MVC1	A	006	6389	1810	1803*									
MVC10	A	006	64AE	1946	1944*									
MVC2	A	006	6672	2084	2069*	2070*								
MVC3	A	006	629A	1710	1709*	1728								
MVC4	A	006	62E0	1729	1728*									
MVC6	A	006	6294	1709	1708*									

D443 S/3 3340 AND CARD UTILITIES --- MOD 12

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
MVI1	A	004	63F5	1847	1844*
MVI2	A	004	6400	1851	1850*
MVI4	A	004	65EA	2042	1941* 2057
MVI5	A	004	660D	2058	2057*
M1442	C	001	0051	2453	1303 1333 1353 1419
M3741	C	001	0040	2454	1330 1408
NEG3	A	002	62E8	1756	1804
NEWADR	A	006	5AC2	0986	0967 1246
NOCHK	A	005	51A4	0219	0216
NOERR	A	004	6120	1545	1536* 1537*
NOTBLK	A	004	6279	1687	1659*
NOTDAT	A	004	57BE	0690	0687
NOTDON	A	004	5812	0717	0742
NOTEND	A	004	5923	0809	0806
NOTIN	A	029	6FDF	2382	1498
NOT2F1	A	001	5F93	1418	1413 1477
NOT3	A	004	547A	0443	0440
NPRT	A	001	71ED	2432	0528 0529* 0647* 0668* 0991*
NUM	A	002	7019	2391	1486* 1487 1529*
NUMOK	A	005	51EC	0240	0237
NUMPUN	A	002	7233	2461	1464
NXTCHR	A	003	6222	1664	1685
NXTSEQ	A	004	5DF9	1242	1059
OK	A	004	6087	1508	1494
OKHEX	A	003	617D	1589	1583
ONE	A	002	7015	2389	0258 0665 0673 0721 0727 0733 0741 0753 0811 0821 1193 1486 1590 1707 1711 1715 1721 1724 1945 2008 2052 2140 2145
ONLY	A	015	7477	2500	1321
OPINCP	C	001	0001	2553	2229
OPT11	A	004	5A33	0925	0916
OPT12	A	004	5A9E	0968	0926
OVFLO	A	004	6124	1548	1541
PACK	C	001	0226	2570	1140 1250 1254 1258 1262 1596
PAGN	A	004	54A9	0453	0489
PARERR	A	041	6FC2	2381	1561
PCHAGN	A	005	5948	0818	0822
PCHECK	A	004	613B	1558	1543
PDESC	A	032	531D	0307	0247* 0251
PFLAG	A	001	729C	2470	0651* 0657* 0688
PID	A	003	52C5	0291	0219* 0620*
PINW	A	043	700A	2383	1503
PK	A	006	5504	0481	0479*
PK1	A	002	5488	0459	0452* 0461* 0462 0467* 0468 0473* 0474 0479 0483*
PK2	A	002	54CD	0465	0462*
PK3	A	002	54E2	0471	0468*
PK4	A	002	54F7	0477	0474*
PLINE	A	001	531E	0308	
PNCHCD	A	004	57C2	0692	0676 0682 0685 0689
PNCH80	A	001	5F5D	1404	0662 0693 0704 0819 0853
PPLVL	A	001	52DC	0301	0240*
PPNEC	A	021	52FB	0305	0246*
PPTID	A	004	5FE8	1443	1440 1451
PRGID1	A	003	56F3	0627	0621*
PRINT	C	001	021A	2569	0148 0198 0202 0212 0248 0339 0484 0490 0494 0543 0606 0633 0780 0792 0902 0939 0943 0947 0955 0968 1041 1075 1309 1314 1318 1387 1495 1500 1548 1558 1614 1623 1632 1641 2148 2153 2158 2167 2176 2210
PRINT1	C	001	021A	2460	0079 0083 0087 0091 0095 0099 0103 0107 0111 0117 0121 0182 0317 0321 0325 0329 0333 0352 0356 0360 0364 0370 0374 0378 0386 0394 0407 0418 0563 0567 0571 0575 0592 0600 0840 0845 0888 0892 0896 0917 0927 0931 0935 0972 0976 0980 1010 1019 1023 1027 1031 1035 1062 1097 1101 1105 1109 1113 1117 1121 1125 1197 1204 1208 1212 1217 1222 1280
PRTBUF	A	001	4AC0	0040	
PRTLN	A	001	5565	0511	0456 0460 0466 0472 0478 0480* 0481* 0482* 0487
PSBYTE	A	001	7205	2440	0428 0500 0549* 0550* 1244 1599 1601 1603 1605 1607 1610 1611

D443 S/3 3340 AND CARD UTILITIES --- MOD 12

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
PUNCH	A	001	596A	0837	0166 0856
PUNCH1	A	004	597D	0845	0839
PUNFLG	A	001	71E2	2425	0849*
PUN42	A	006	600F	1457	1420
P1IAR	C	001	0020	2564	
P24	A	004	5F81	1429	1438
P5424	A	004	5F98	1424	1407
QUITFG	A	001	644C	1916	
RC00	A	002	6F4F	2359	
RC00@	A	002	6F53	2361	2359
RDAGN1	A	004	6015	1458	1462
RDAGN2	A	003	5FC4	1434	1424* 1441*
RDVTO	A	004	517F	0208	0218 0252
RD00	A	002	6F51	2360	1509
RD1	A	004	5372	0350	0348
RD2	A	004	5111	0162	0157
RD42	A	004	5F18	1370	1354
RD80	A	004	590C	0803	0813
READBF	A	002	722D	2455	0789 0804 1359 1370
READIN	A	001	0A80	0026	0155* 0156* 0163 0165 0167 0169 0171 0173 0175 0346* 0347* 0350 0405 0413 0416 0431 0435 0437 0439 0441 0443 0445 0447 0584* 0585* 0588 0590 0616 0620 0621 0622 0852 0854 0909* 0910* 0913 0915 0966 0986 0988 1051 1054 1056 1058 1060 1071 1073 1083 1085 1086 1133 1160 1162* 1163* 1164* 1245 1672 2456
READ1	A	004	536E	0349	0338
READ2	A	004	5404	0407	0369
READ80	A	001	5EE5	1349	0788 0803 1458
REC@	A	001	5259	0280	0230* 0233
RECORD	A	001	0210	2464	0161 0349 0411 0587 0618 0850 0912 0984 1053 1158
RED0	A	004	50E4	0146	0189
REP1	A	004	5FC0	1433	1442
RESNS	A	004	6225	1665	1675
RIT37	A	004	606C	1484	1409
RTN01	A	001	506E	0051	0016
RTRY	A	004	6214	1660	1670 1677
RTRY1	A	001	6530	1980	1970 2019
SAREA	A	005	723A	2463	0385* 0393* 0401* 0404
SAV	A	001	7227	2447	0990* 1248 1274 1278
SAV@	A	002	7032	2401	1092* 1233
SAVCRD	A	001	0800	0028	1439 2458
SAVEID	A	004	6F73	2378	
SAVXR1	A	001	7034	2402	1144* 1145 1155 1175* 1179 1180* 1184 1577* 1592
SAVXR2	A	001	7036	2403	1167* 1171 1186* 1190
SAV20	A	001	7220	2445	1414* 1476
SBYTE	A	001	71FD	2437	0429 0431* 0501 0988* 1578 1598
SBYTE4	C	001	020C	2573	0217 1873 1877
SCANRD	A	006	65A8	2024	1951
SCDFG	A	001	6F59	2365	
SCNVTC	A	004	6310	1770	0625
SCNVTE	A	004	6411	1858	1848
SCNVTR	A	004	6415	1859	1770* 1772 1774*
SCTR	A	001	72C2	2483	
SEC@	A	001	5258	0279	0225* 0228
SECCNT	A	003	555A	0505	0434* 0441* 0445* 0447* 0449 0451* 0492*
SECFLG	A	001	7207	2442	0876*
SECNT	A	002	7021	2394	0645* 0665* 0673* 1487
SELDRV	A	004	641A	1872	0078
SEQCTR	A	004	6F62	2373	
SEQND	A	001	7029	2395	0650* 0671* 0672 0712* 0760
SETCRD	A	001	5E61	1294	0619 0777 0851 1352
SETUP	A	004	58FE	0800	0791 0824
SFLG2	A	001	7206	2441	0875*
SIOI	C	001	0018	2574	
SIO1	A	003	653D	1990	1957* 1969* 1971* 1994
SIO10	A	003	65D8	2037	2024* 2025*
SIO11	A	003	65D8	2034	2026*

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SIO2	A	003	6656	2076	2065* 2066* 2067
SIO3	A	003	665D	2078	2068*
SIO4	A	003	6668	2081	2067*
SIO5	A	003	653A	1986	1958* 1974 1975
SIO6	A	003	66C5	2115	2113* 2114*
SIO7	A	003	657D	2010	1961*
SIO8	A	003	655E	2000	1974* 2099
SIO9	A	003	6561	2002	1975* 1976*
SIXTEN	A	001	71E4	2427	
SLDRVR	A	004	643C	1889	1872*
SNSAP	A	004	66D0	2120	2181 2216
SNSAPR	A	004	6742	2165	2120*
SNS24	A	004	66AB	2109	2195 2224
SNS24R	A	004	66CC	2118	2109*
SSWSET	A	004	5E88	1328	1308
SSW1A	C	001	0020	2579	1306 1334
SSW17	C	001	0001	2576	1307 1328
SSW18	C	001	0080	2577	1306 1331
SSW19	C	001	0040	2578	
SSW20	C	001	0080	2580	0217
SSW22	C	001	0020	2593	1873 1877
SSW23	C	001	0010	2594	1873
SSW24	C	001	0008	2595	1873
STATE	A	002	6461	1924	2110* 2196 2199 2202 2205 2208 2225
STATUS	A	002	6F5B	2366	1539* 1540 1542
STATUX	A	002	7018	2392	1362* 1363 1375* 1376 1377 1430* 1431 1436* 1437 1447* 1448 1450 1468* 1469 1470
STATU1	A	001	722A	2449	1668*
STFLG	A	001	525A	0281	0241* 0244
STINF	A	001	5713	0642	0631
STPFLD	A	004	6284	1706	0269 0547 1838
STPFLE	A	004	5622	0547	0530
STPFLR	A	004	62E6	1731	1706* 1707* 1708 1711*
STRET	A	004	620C	1649	0415* 0497* 0987* 1621 1630 1639
SVPREQ	A	002	71E2	2424	0058
SWITCH	C	001	020A	2565	1306 1307 1328 1331 1334
TABLE	A	001	760C	2531	0748
TDDCF	A	001	6457	1920	1922
TDDCF@	A	002	645D	1922	
TDDCR	A	002	644D	1917	
TDDDF	A	001	644E	1918	1923 2084
TDDDF@	A	002	645F	1923	2074 2077 2079
TDDDR	A	002	644B	1915	2073* 2083
TEMP2	A	002	72A1	2474	1820* 1822 1824* 1828
TEMP3	A	002	630D	1767	1771* 1858
TEMP4	A	002	6283	1704	2122* 2164
TEMP6	A	002	72A3	2475	2121* 2163
TEMP7	A	002	72A5	2476	
TEM1	A	002	66A9	2106	2111* 2117
TEST	C	001	0212	2566	0162 1324
THREE	A	002	7012	2387	
THRU	A	004	5490	0448	0436 0438 0442 0446 0504
THRU1	A	006	54A3	0452	0450
TIO1	A	004	6536	1985	1964* 2100
TIO10	A	004	65DE	2038	2028* 2029*
TIO11	A	004	65E2	2039	2030*
TIO15	A	004	6652	2075	2064* 2071
TIO18	A	004	63DF	1836	1818* 1819*
TIO19	A	004	6568	2004	1997*
TIO2	A	004	6664	2080	2071*
TIO4	A	004	6540	1991	1959* 1960*
TIO5	A	004	6580	2011	1962* 1963*
TIO7	A	004	6544	1992	1965*
TIO8	A	004	6564	2003	1977* 1978*
TIO9	A	004	65D4	2033	2015 2027* 2096
TODYRK	A	006	661C	2064	2055

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
TRANS	A	002	6F5D	2367	1492* 1493 1520* 1521
TRKCC	C	001	0002	2552	2228
TSTDAT	A	004	6247	1674	1667
TSTEND	A	004	60F1	1528	1525
TSTN	A	002	7235	2462	1682* 1683 2465
TWO	A	002	7229	2448	
TWOOO	A	002	71E6	2428	0812
UMFCU	A	003	0A0C	0018	1297
UNPACK	C	001	021E	2571	0221 0226 0231 0242 0402 0426 0453 0457 0463 0469 0475 0498 0531 0535 0539 0613 0963 0993 1048 1150 1242 1272 1276 2133
UP1	A	002	66FA	2135	2131*
UP2	A	002	66FC	2136	2132*
UTAB	C	001	0232	2567	0055
U1442	A	003	0A12	0020	1301
U3741	A	003	0A15	0021	
U5471	A	003	0A0F	0019	0115 0146 0337 0368 0579 0604 0838 0900 0925 1039 1131
VREAD	A	004	5215	0257	0208
VREADR	A	004	5226	0261	0257* 0259 0271
VTIM	A	001	72C9	2482	
VTIMB	A	001	72AD	2480	2483
VTOCAD	A	005	62F0	1758	0206 1796
VTOCDP	A	001	5165	0196	0170
WAIT	A	004	60DA	1520	1522
WINRW	A	004	6475	1934	0265 0523 1267 1781 1831 1853
WINRWR	A	004	65EE	2043	1934* 1936 1937*
WINRWT	A	004	65E6	2041	1995 2006
WORK	A	002	71DF	2423	0154* 0155 0345* 0346 0384* 0385 0392* 0393 0400* 0401 0583* 0584 0612* 0615 0908* 0909 0953* 0954 0961* 0962 1047* 1050 1138* 1146 1152 1229* 1230* 1231
WORK1	A	001	72AC	2479	0954* 0962* 0965
WRITE	A	005	6907	2264	
WRTVFY	A	001	66AA	2107	2016 2017* 2021* 2089 2090* 2097 2098*
XEXIT1	A	004	623F	1672	1660 1684
XFER	A	004	6090	1492	1506
XREG	A	002	71DD	2422	0057
XR1	C	001	0001	2560	0210 0215 0219 0220 0225 0230 0236 0240 0241 0246 0247 0260* 0264* 0629* 0649 0650 0652 0655 0658 0670 0672 0675 0681 0681 0683 0683 0700 0701 0701 0702 0715* 0717 0725 0731 0736 0739 0739* 0748* 0751 0756* 0758 0759 0760 0800* 0809 0810 0810* 0817* 0818 0820 0820* 0997* 1003 1004 1005 1006 1016 1016* 1087* 1089 1089* 1092 1093 1094 1095 1096 1133* 1144 1148 1154 1154* 1159* 1170 1173 1175 1176* 1178 1179* 1180 1182* 1183 1184* 1189 1191 1191* 1233* 1234 1235 1236 1237 1577 1578* 1579 1581 1585 1587 1589 1589* 1592* 1771 1772* 1802 1802* 1803 1804* 1844 1850 1858* 1935 1936* 1940 1950 1967 1982 1983 1999 2014 2031 2032 2041* 2082 2087 2095 2121 2123* 2131 2138 2138* 2163*
XR2	C	001	0002	2561	0716* 0717 0718 0720 0720 0723 0725 0726 0726 0729 0731 0732 0732 0735 0736 0737 0740 0740* 0743 0749* 0750 0751 0752 0752* 0757* 0759 0789* 0790 0804* 0805 0809 0998* 1009 1017 1017* 1160* 1165 1167 1169* 1170 1171* 1173 1183 1186 1188* 1189 1190* 1192 1192* 1660* 1661 1662 1662 1672* 1678 1681 1681* 1682 2122 2124* 2132 2137 2139 2139* 2142 2144 2144* 2164*
XXX4	A	003	5CFF	1165	1195
XXX5	A	003	5D6B	1191	1172 1185
XXX6	A	004	5D1E	1173	1166
XX00	A	004	5899	1053	1040
XX01	A	004	5B9D	1054	1052
XX03	A	004	5B74	1039	1069 1082
XX11	A	004	59CB	0888	
XX12	A	004	5A0B	0912	0901
XX13	A	004	5A0F	0913	0911
XX14	A	004	59E3	0900	0924
XX15	A	004	5B4C	1019	1238
XX22	A	005	5D33	1178	1177*
XX31	A	004	5CDD	1158	1132
XX32	A	004	5CE1	1159	1157

D443 S/3 3340 AND CARD UTILITIES --- MOD 12

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES					
XX33	A	004	5C75	1129	1232					
XX34	A	002	5CCE	1153	1145*					
XX37	A	004	5CC6	1150	1147					
XX38	A	003	5CCF	1154	1149					
XX44	A	004	5D13	1170	1168*					
XX52	A	004	5D55	1186	1174					
XX55	A	004	5D63	1189	1187*					
XX56	A	002	5C99	1137	1135*	1143				
XX77	A	004	5D4A	1183	1181*					
X255	A	002	630F	1768	1822	1824				
X256	A	003	524D	0274	0260	1946				
X4	A	002	700E	2385	1537					
X80	A	002	700C	2384						
ZER	C	001	0000	0159						
ZERO	A	002	7017	2390	0801	0815	1529	1725	1791	1799

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

D443 S/3 3340 AND CARD UTILITIES --- MOD 12

OBJECT CARD LISTING

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

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

 GBK GBD   PN 42  48223 EC 827872  3340 AND CARD UT  ILITIES   MOD 12  84a84aaa                          D4430000
TF YQ5D<  &  MF8     |   A   ED  D     <E&                                                      2,0D4430001
T+VBY &C""3S  T|  2D -11PG)<*N18*B  GRA, /OHE S(YH<B  G /YACF-%OH*BF-D  )EDX /OHE &5YN%B  G /Y 5&8D4430002
T+VCT &5YQaBG /Y  AH6SFOH*BF-D;EHL  /OHE /RY>%BG /Y  BHFTE+B HC?H&B<B  G /YBHFUBOH*BF-Q  M$3% OR-D4430003
T+VD;+B HC?H&H%B  G /YFJW7QOH*BH_L  /< A1700 BYA170-  BYAJC|HGA¬C /6H  &OH*BDT79BYC -ME  /|¬D OC D4430004
T+VERBYC -NVD|¬H  H-<BAO.Y'aOD OHE  JRL74BYC -N<;|¬M  H-<BANT-''-D OHE  RD*BG /,FIWU_5.¬  /OH ;YaD4430005
T+VFMH_K7OH)&9<B  G /Qa P %OH*BF-E  GMDG /OHE KEKO-O  DRF9Sa<BGM/M) VI  L ?HAB*BG /YOOH)  &-J4 4HDD4430006
T+VG| VIOA?HABCS  -3 UEE"G IK1&Q  * EIPBaBG /8AMV)  K2JO MV-(OH*BG-E  KOE.+G AKO&# /OH  ; NH #S%D4430007
T+VHHON.KC IK6EI  &LODNMU, -NG%ASA  K6EI&OH)J6JOAM_O  HG AKO/¬ /OH; NI  EM>D*EE.#X10¬M16  "OH* =3QD4430008
T+VIE /YAO5<)OH)  J¬3&HMSU| G %*AP  2-&-6 NI(OH*  CO  O*BOa.6J2O-D< <B  GRGO C AUE*BGOYJ  U$%  #C D4430009
T+VH /5HW  D  &C  Oa|GAO=|O4a&      5a¬M&DCP1'J 4'$  CO;|I5_N &(XEO4A  5a¬M&DCS:+.T1)J  &(* M8QD4430010
T+VH#5MCA5*J 1*(  5;LMO%PR&DA &DA  &<LE8%|R2)¬T2)$  N2*J &DCC:(( &<T  D&DCR1*( &DA#&DA  4aM 'HQD4430011
T+V.69MA 1_|A14A  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &D  2EQD4430012
T+V<1&DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA OH*BF-H  |EO. /OHE S(Z/*B  G /Y :Y%D4430013
T+V(% &1D_%BG /Y  ADO,GOH*BF-QOE_a  8H Y+a/ /OH*BF-R  F$)T /OHS5+DO GG  ¬C  H-GG¬B  H-ED  <aY* 5H*D4430014
T+V+XA<BGQ/ 'a&D  a-FEOH*BF-DYEO¬  /OHE K/,.aBG /Y  AHF_POH*BF-<YE7a  8H Y+a/AUOH*BF-D  U$¬O 4LHD4430015
T+V|SOH*BF-D$$/¬  /OHEAS5>J<BG S.  M83  *)a< PH7*)"  /OHEAS5>**BG S.  M9C  *)a< GH8*)#  /OH KY%D4430016
T+V&)F-QO$DG /OH  S5+MO GG¬C E2+XG  ¬OH*BG-N2+-DIaY)  DOH*BF-QZE:T /6H  &aY*5|¬UH-<BAMHD  < OH O&8D4430017
T+VJQC7G1|¬<H-|H  AE<BG /,BIWU_J.¬  /OHSJ.¬ /5<;OH*  BG-(2APG'aY*FC N  1"&DEOH)/M%BGN)4  < VM 9YaD4430018
T+VKLOVI&|)MH/"H  A.L5 BY¬2-KQ'& D  IaYDIC INO-DIaY*  O|M HS|HAB&OANNY  HS|HGA-O NNYH/30  NO< :.QD4430019
T+VL+C&INOXGPa-D  ⊢C INOVI&C EM>EN  *OH*BG-ENQ5NWOH*  BG-&  ENOC-EM>EN  SC EM3NK8OH*BG-&   EM *DUD4430020
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OBJECT CARD LISTING

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

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T+VMI;&8AN./NQ-O  AN+IM><BG /8D A  N--8AN./NQ-OAN!)  M><BG /8D ANSOO  AN&VM>C1*NQ@<C5O  ¬ 6C*D4430021
T+VND]E1NY 8AN./  NQ%BG /YA!EO-C-A  NQ5NUO EMD*BG /Y  JAOINOVI&@-DIOH*  8F/$ /5<;C ESC7G  1OH* 73HD4430022
T+VN" /8C*-N1"*B  GQN. /5P)OH)MU!C  0@&OCO*$N8O D AA  &DA &DA &DA &DA  &DA &DA &DA &DA  &D )#HD4430023
T+VO:&DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &D L/YD4430024
T+VP5&DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &C&HNT*<AFJ>*-H  @ FJ2OH)U)Q < FJ  Z]¬@ :Q&D4430025
T+VQO*;4@ GG_@YD  TOH*BG-E1"7KBOH*  BG-E2 PK<OH*BG-E  2 XKPOH*BF-D-)I¬  /6HD*-H< GHC*¬@  < PH P3 D4430026
T+VR,APHBOH* <B  G /YA+O1;OH*BF-D  T$HG /OHE J)%W<B  G /YFE62?+B HC?H  &F*BG S.M8L *)@  < Y OD D4430027
T+VEW-GG¬B H-ED  <@Y*DOH)SDC718YC  2-JO'=&D OHE&-*B  G /,FIWU_5.¬ /OH  S5.¬ /5RQOH*BF-Q  R$<- 'AHD4430028
T+V$/+B HC?H&G%B  G /YF&64.OH*BH-C  S< A17@BG /BC*)@  H-?HGA<BGQ/C /59  /C IK1&DBC IO@OD  BC H N,0D4430029
T+V**).%H--OC*-_  OG@bGQ1 &DA O-D  H-C4|N?C2-JL /OH  E1-'41'JEOH*BH_J  EOH)O+ OD*-H<C-O  A*BD LA D4430030
T+V)PCAM@"7G_OH)  N7M1¬PO1¬G )OHN@  @ GH*L&<CO.X2 &8  :C7H)¬))K@-DD||'  2XG7M |HAAC,O*Z4  @"7H 3D%D4430031
T+V;KH*BGP54' GH  )@-DICOE0HP N@YE  /||'1@*BGN)5<N5*  <NOQO*BVKMDOGP7  ZCOE0HP N@YE ¬NO  @YD O@0D4430032
T+V¬(.TTO*S?2DAM  ' GH)@YDGPE)|P"H  AFNOGL5"2/1Q' GH  )@YDG]¬'2X|HAA<B  GN"H@"7H/OH)¬P*B  GN64 ; MD4430033
T+V-H|&A2XLO *Z7  NQ8¬DAPPENON40  S|PN/||'2H*BGP57  /5Q8|A5OD3&HO.M  <A7 Z8(@@&AAHCE@  &J1 ;EUD4430034
T+V/CK<HABHGB -"  YX <C ,O COF*B2  > O<CCOA0.G NO E  QG$? COD*B2* -<  B,-HC O@ *B1OE*  AOCQ PT%D4430035
T+V/=>@ A| IO.IO  A OH> &<CCOA0.G  NO EQL#? ZO OH  #0 |K &|S -&| G  L*AP N-KT IP*ZY  @OG 2 HD4430036
T+VS9D@HA)-3B -"  Y. AQU B* B-H  ACOA0D7 NO EQS<H  A8HCB -"Y-+< $E(  MM4OGP7 ZOH* |A  ,E4 8Q%D4430037
T+VT4OH):QL7O*S?  NTEOH*BF$QY*=T  M&%BG S.M&%BGMHG  /5@V(&I2.Q4EAP+  N@YDMOH*BF%QX*@C  M&< )88D4430038
T+VU?/OHS5DC /5S  :O-D< OA*B1DE3O  *B, /5@V(&I2.Q4  C 7+R@-DG||'OH?H  GE61|L4"K N + P  %*AM 98QD4430039
T+VVDC&EO.GGWO E  RC 4A*B1OE@BAMHG  B &O GD@H34" /5'  )4-E&COEO.G NO E  RKC7"*B, NT=OH)  &-L- 61<D4430040
T+VWYH Y+@/ <OH*  BF-Q>$2¬ /5BAOH*  BF-Q$).-@"7GSOH)  SD<BGPWD<POT¬B_"  /5')C&E1'ODA0HE  &-* H <D4430041
T+VX-/5VD| A2ATO  *-*@& 3"|D ("03  =C|8<"03=C¬8("03  "C"@("@BG /YAHO?  9OH*BF-DN$ # /OH  EA/* QHHD4430042
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OBJECT CARD LISTING

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

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T+VY$$BM8H Y+@/  /OH*BF-RF$)T /OH  S5+DO GG¬C H-GG  ¬B H-ED<@Y*DOH)  SDC79BYC -NBA|¬D  H-< MIDD4430043
T+VZO-NY3OH*BF%Q  WEK5D_@BG SID_@b  GO;<8H Y+@/AUOH*  BF-DYEO¬ /OHE K/  ,.@BG /YCHF_POH*  BF-D PC&D4430044
T+VDJIF7@0H*BF-D  $$/¬ /OHEAS5>J<B  G S.M83 *)@< PH  ,*)" /OHEAS5>**B  G S.M9C *)@< GH  %*18 ¬-<D4430045
T+V,<OH*BG-(2, D  Ea@Y*UOH*BF-DYEO¬  /OHE K/,.@BG /Y  AHF_POH*BF-QYE'C  /6H&C N4X&DEC E  SC7D EJ8D4430046
T+V%G#OOE*¬4H/*B  GQNH<AGHX*-H@"7G  _OH)N7*BG /8 C|@  |"@HAC¬"B -O C E  O.XGRC EOTP >|DA  0300 5JDD4430047
T+V_B|XC+*<@*A7B  PBA0G*HD&G )OD1-  *A7B5HC1**.8@PGC  |.'03-" /OHE U/  030QA*8916&4A*B9  16'H =EOD4430048
T+V_' KCS /C N,  'OH*BF-DR$KL /OH  E J'_&@BG /YAE65  EOH*BF-DS$P3 /OH  EA/R_UT--8-$2DA#  /OH #2HD4430049
T+V>8F-RQ$?X /OH  S5+DO GG¬OH*BG-I  17ODB@Y*DOH)SDC7  1BYC -N?J|¬<H-<B  AP-Q''-D OHE)=L7  9BY :9<D4430050
T+V?3OHE&-*BG /,  FIWU_5.¬ /OHS5.¬  /5_4C&DH-XG@YH  IC&DH-XG$@YHMOH*  BF%QWEN(D><BG SI  D>< M$4D4430051
T+VO>/5_4C EO.-D  BC EOT&DBC EO=&D  BO-D("HG 'HAH *  A*B916* APA 4 P  2G )OVO-*A7B/DAO  G*H% 7TQD4430052
T+V1ZFAOG*.M-OH*  BF-H>*.P /OHE J_  ZY<BG /YA.WX+OH*  BF-HOE¬# /OHE LI  D<<BG /YA(FZUOH*  BF-D 9-UD4430053
T+V2U.WDKOH*BF-Q  QEDY@&GAUCB_OQ7A  U+B HC?H&N@HABYU  < P O*)U@ N2ROH*  BHU&A< A17OQA*CA  16* 6Y%D4430054
T+V3¬/OHW X OPIU  4 P 4C E*3X 4|MA  17"HABDOA GHE@Y*  IOH*BG-E17O 4-D  B|E'O(< APIL2/OL  /6H 3L D4430055
T+V4ED<HA*ICB -D  H| A0.-OABZE2W-O  ABZ_2W-OABDN2W,5  |HAFL&B*CQ< E4  N*B#B XC@X CM  B*CQ J/OD4430056
T+V5N@Y)($& |H  A<C&A*CLB P "C A  )(P >L *)D5 P  4( EO( O PM1O.%H  A*|1% (&EO(|H  GET& 2C%D4430057
T+V6& X 6C A)RP  >O-IO"IO 5 X  64-DAB-HAC-AO.X  N|KRO.% AP|@<GXC  M*|| /OHE M505 O  A*&M RS<D4430058
T+V7.*ZY< PD|*ZY  < PDR*Z. /OHE N_  1L%BG /YFMPBGOH*  BF-D2*QC /OHE LJ  1_<BG /YFGGG&OH*  BHU& KIDD4430059
T+V8F:C *)@:@GG  ¬|¬E17@BAPGM5 P  2L *H*&(<A1A1CMO  GFGDPL *-*KG /5_  <OH*BG-(2A&DEOH)  EO-O #QDD4430060
T+V9AAFJ>*S*@ FJ  2OH*BIY +¬OO"OH*  BIY +"O1"OH*BIY  |¬O2"OH*BIY |"03  "OH)U)M < FJZOH*  BG-D &,8D4430061
T+V9@*SJ?|*BG /8  B*S)?&*BG /YFDW'  (OH)RD*|C2<TR6L&  HP>&@ GH,+8 HB"H  &A330*S?2/4D8H Y  J@Z 7LOD4430062
T+V:7+T1J*S?2/3<  9Y H.+&DBB?H&H<B  G /,AGX&F5D| /OH  E-LI4+<BG /DF|7J  7OH*BH_JCOH*BD%B  GPYM 2:<D4430063
T+V#2+ DBB?H&AC1  *S%8- H.@Z D|EE  2H3-- -22U &@@GH  ,|&A2H@BAPYP /O  ( /¬|T4 *S? -N9  /|ND P,8D4430064
```

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

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T+Va_*S? -NaQO¬A  ¬|3G5*S73a&PAaNa  D<|(OF3WF*A? UE#  9OH)¬+3EM*S7AMEa  "a5D ONI¬H3O P2H  OM7  &TOD4430065
T+V'YF3W7*A%9G7  ĒOIA¬G<BG  4BE'  *COE¬PG &OH*BF%Q  ;*8"M#<BG S.M#<8  G  4BF +|¬A2H"H  A<34 "9DD4430066
T+V=T&GH,OHE-$CO  *-O'"7H/| A2H¬H  AE OL*S H7OOB8<'  2WT3XB<Oa"7H<|NE  2HaBAQ aaAV"F<¬N  2<LD aD%D4430067
T+V";'XG%<¬J1# 1  ¬CNaH7aG8P3aOa7  $+AAOF?H&E3G5*TG  3=&$A=N"G<|(OF3W  F*A? UE=1CNa.P7H  ĒaYD PĒMD4430068
T+W RBCODPa$ /5"  O¬/¬|3G5*TG3"O$  A"5"3<|(OF3W *A,  UE"7+¬9OFaB&P=T  /O CDaH3OT|OH)  ;9&4 &BHD4430069
T+WAMLOT|*Z,2-&-  a NaSOH)-ELEM*Sa  1MGH3ONA¬|"(M <E  KQCUOM7 $+LROF3U  |*A, UF 2|¬'2CCO  *-O 5$*D4430070
T+WB|a-D&CC%H37H  ĒCA<HU7H-OH)¬UaB  GQ %' GH)aYDFC E  OFP NC&EOHP Ra-D  D+YA?PTEA$5M<P05  ¬B(a 5THD4430071
T+WCH<D(?PL-A$53  2DA3 /OHĒOJ5?7'7  ZOH*BF-Q,* , /OH  S7;X /6B&OMA/ -O  AQ<_?M¬(CBCEB$5*  1J OD8D4430072
T+WDE |(B <EBQ<"  A&FDBa4<H<D(?PL-  A$53 UFCĒ+HA?P?H  &A<BGQF-8"6';C E  OFP Pa4(&OH)-ĒC&  HQK< aZ*D4430073
T+WE COE/H7 +<DI  ?O3-B$5, DFDU+ /  ?O% &QL? /O OH*  BF%QS$9X|8%BG S.  )8?(CD<BGM&7 /OH  ĒlSU $CUD4430074
T+WE#$a.)8aBG S.  )8"(CD<BGM&44BFG  B| RO.C&A*CLB PG  8¬*D aYI>¬*Q aY&  CaY*<¬¬ aYI¬¬¬U  aY& *K<D4430075
T+WF6O)HA &a *B1  OE* AQOH5 P 4OH*  BI-R1"PHE|KE2 "H  DK34L*-I.2/A8' GH  EaYE&|LA2A¬HDK&O  *¬a 'A8D4430076
T+WG1*-<< PHB*-P  /O OH*BF%Q6)L#  MJ%BG S.MJ?HG(%B  G /,F<7OM5D¬ /OH  S5D¬2/2| /OHĒ1T9  54_& RA D4430077
T+WH%K<BG S.MK|H  GD<BG /,F&PMH5DX  /OHS5DX /O ( /  S¬CMBQUH8&H+%-YH  Ca1/Aa1 J<AE2(L/  *TM PKQD4430078
T+WIXaZ P|C52HT-  -*TP DFHMa1 AO-H  H-<BGQXQ8BGH5OIA  SIL-D*TP DFHMT  *T&1FGH531SA8¬H  A( H ĒI%D4430079
T+WHS*TM'8GH5OHE  S|aBGQS.3FDC /O  ..........  C&HQ>U  + O.Z*AM< OHRQ>U  < OH¬ <AFHA  + OH ĒK&D4430080
T+W.):P N|LAS-¬H  BB&8 QYEOE¬HGIC4  LQYC2 -4a OHAC-E  S-G NaY*&C-ES¬X  NC ES-G P| ES-&O  AQ>< ĒI-D4430081
T+W<QQZa<A QYG  /O "=4 - &  D A < D D <<$  A8- .....  E1  *P |a4BF&Q( E  TCLH a2<D4430082
T+W(L O&QC-EUFG  &C JU$W.:| AU*%B  GRGO C AUĒ&4BC I  S"=HAB&OHQO-<B"H  GE OAQO/OEOODQON  S'LO OĒ D4430083
T+W++ F<F| AT O  DRF9Sa&CO RGH( O<  H*A¬2-Q¬K &<4 O+  +(-ES:33"C|a<"-3  =C|a< OOC*DU< -O  F ;8%D4430084
T+W|IC&H<AW<.a-D  H| <¬01=CG8<¬30  *Za< F|-RAU: 6|  -C E2YO<HC&E2YO<  |a-&(COE2YO<i||9  U*?H P,UD4430085
T+W&D/OY< FJ2*DD  a"7H¬OH)U1K < FJ  ZO&AT"<BGQYJUST7  "*Z" O+6( ET=CO  C2/1M4 O&C| a  CO 2BOD4430086
```


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

```
T+W&" FJ2OH)U)Q  < FJZ(&ETC*BG  (  /U|3U8 -32U -  aOF&R||E?+3-- -3  2U -a2F&R|||?+aB  G  L-OD4430087
T+WJ:  .....  .....  .....  FJPRD8  I M O  &  /Q4BFP  1( D O$ D4430088
T+WK5*;<5 OP1C-E  VaOJV| ZUĒAOAR.U  DC EV#OK9C-EU>OJ  VC-EU>OJXC EU%OK  9C-EU>P NC H EI  (C U 5AMD4430089
T+WLORDU OARQ)  U>P-- < &RĒ-< FM  =RAU< FM&RAU< FN  ARAU: WNAC AV¬W&  RC AV-O&R+-EV-&O  RL* 8.-D4430090
T+WM,RAU< FNERAV  8& C2D *: OM=aY*  D+-IV|-OARO'U>&O  ARN/U>&O RN'V+OO  ROIV+3YAROH< FN  VRAU 98QD4430091
T+WNW+-IVRPGD XG  FA<D R7.3 C3 C  A FN O&AX3C-8RL#  2UI*< FNZRAU<B&  RDV11 .3 C3 |  A FM &88D4430092
T+WO/R<D RĒ '"O  aYE3COAUĒG NOHE  XO?< *D RQ <B&  RDV'H C2-L88"6Ē  D+"'WD% &RNP /6M  O||a ¬A*D4430093
T+WP*RD, /6¬<C A  V7F&R+-(V7 O R)V  UF&O R)NUF&O R)'  UFLYBR)a< FPTRAV  11 I11-LA F)2aO  aO "&&D4430094
T+WOPC<D R)#A F¬  <(&E1830 C /O  ( /WFOa RF/OE*B  AR5Y'CN GaYDNC E  WDFP_| C4+M ¬  2-P* #CQD4430095
T+WRKOH* O RV(  UF&O RV)UFLYARV*  < FRZRV*< FR;RAU  < OR5R.U| OR5RFM  < FRVRV<O1FJ.<*J  UPaD #24D4430096
T+WĒ( F)2aO A<*R  UP"< CGDRE"A F)  2aO A**QD<*JUKOO  D AUMX4- <BAR)%  8"6ĒD+"'WD% &ROG  /6M K%D4430097
T+W$H|P4- <BAR)&  8"6ĒD+"'WD% &RN#  /6M6M 4BF$  |<<NUQLCDRDU11FĒ  XC AW1W&R+-EW1?<  A3D ¬.HD4430098
T+W*C1FĒZOH*  C&  HR4M4 PHT( IS-aH  AN CB V R| R1430  D*)&4 O$:( IW"<B  G /8A .1 )H  A ;H &QHD4430099
T+W*= -<| GGM*AP  O&%T HA*Z,S -<  | GGL*AP O$YOH*  BF-H_*7G /OHĒ VR  3GaBG /YFNVA_(&E  2Y3H 200D4430100
T+W)9 WHCOH*  <B  G /,BEPQ.*** /OH  S*** /OHOOH*BF%H  V*4L"*BGR_C /OH  S"*# /OHO( /X20a  AR2% 3ZaD4430101
T+W;4*AC /6Ē,+AA  UQ|H&AC34)188HFJ  -aZ D||(57T/ RFC  2U &aaXP;+HAUQ|H  &AC31)188 OJ/OAA  XJ% L3MD4430102
T+W¬?/OHĒ1SJ5'?"  aOH)W4<BG S.""<B  G C /6Ē,+ EUQ*  &R4Q9 V +&E& *B  &R¬H9IN +J1& LV  8M H L8aD4430103
T+W-DOIAV*OOAR&_  U)<BGR8CE5;|E6MC  T2<N 5;LMO%PR&($  F&($P8aXO5MCD1;.  .6*PD;?E &DCK1;T  P9(M MHOD4430104
T+W/VOaT2&DA 1+L  P4aXCO;|E&|TO&<|  O4=LM5MCD1*|K8?(  &DCV8'$C&<LU5(¬  4&DA 1<XS4UCD9(L  P'M 42-D4430105
T+WS-&DCP9(PC2DC  P6)$G6*GM8UCR1;.  I1<XN14CO5MCD2;.  K'UA &(¬A8a|HQ*L  I8_¬LO;/ 1<XS4UC  R1*< QT<D4430106
T+WT$5_XD8?V &DC  T1)XM2)PA8aPS&+.  EO=|I5_PD2;.K&<V  /5UCO5MCDaOCS1;(  8>.Wa?I 1_$R&<L  2K3M :00D4430107
T+WUO5;|E6MCO5=|  I5_N 5;LMO%PR&EA  5'XE8>I O<PN1FA  4%PYK4A 9_XI8aN  -QFA 1)XR5_V QFA  -&D NS-D4430108
```

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+WVJ&DA &DA 6*N	-1)PT1)V 5_¬T2)$	NK4A-QFA 1)XR5_V	QFA-&DA 6*N-1)P	T1)V 4@XN1MCN9(L	B1)U &L4D4430109
T+WW<K4A*PDCD2;.	K&<LU5() PE3E5;|	E6MCO5*N 5%R 8@T	E&<$O4'|O9%XN14C	O5=|I5_PS;%PN8@P	R&+< ELUD4430110
T+WXG2<N 0@TA5*¬	E&<LA8@E 2<PR1P,	I1UCU8%XN14CT2<N	'¬L7@O?T2<N 8_¬	A0@N 0%GR&+$I4'(	4@M *$&D4430111
T+WYBO;PE&+|H1*L	A8@E 9(PC2<GN1@P	DK4CP6*PS8UA-1)P	DQDCW2<PN&<LO5*N	1)PT1)XI5*).&<X	F&+& 8KMD4430112
T+WY'8%XN14CC5=J	1<GTOMCS9>I,&<E	2<PX&|LO&<PN8@P	R1*J 9%XL44CL1*G	V1;|H1MCDO;|A&+L	NO@- O/%D4430113
T+WZ8O)PG1*J.&+|	H1MCS8@XK&(|I8=I	9%XL44CI5*|R1)L	E5;(O>/ 5_PE&<$	O6MCEO*|H&<PN8'X	YK4 JQ@D4430114
T+WD31)PT1)V 8@T	E&<|HO)PG1MCDO;|	A&<XN&DCC5=J 1<G	TOMCS9%XTO@TE8UC	3&D9 'D?1QFCD2;.	K&<& R2%D4430115
T+W,>9(LP@6A-0'$	N8@XN9<PS&<LU5(¬	9QFCR1;|U6)PS&+|	O&(LA2)N 5<PN9DC	E5;|E6MCCO4A-&<|	Y4@U #Z*D4430116
T+W%Z5*LE6MCI5MC	H1;) &D7O&+|O&|.	1PMA &DA &DA &<T	H&FA 2<PA1DCI5MC	H1;) &DA &DA(@DC	T5U 4#YD4430117
T+W_U@¬()&DA &DA	&DA 6)V QDCR1*|	O6*J 2)N 2<PX&DA	&D71&+|O&||OPMA	&DA &DA &(N &FA	;4 K3&D4430118
T+W>¬8'R 1+LM547	D1*$A9(|T&|E:&(L	A94C9=¬W)O@|H2(X	R&(PN5M1-QDCE5;|	E6MCCO@TH6)XN&<G	N1D "JOD4430119
T+W?E5'XE8>I 1)P	DO@|H2(XR&DA &D1	-QDCE5;|E6MCCO@T	H6)V O)PD&(¬R1;.	S&<PN1<LI8_I 5@G	TO@- RQ-D4430120
T+WONQ*LI8_¬LO;/	-Q<PN8@PR&($P8@X	O5MCD1;.I6*PD;?E	-Q<LI8_I 5@GTO@/	/1<XS5'|A:|V-Q(X	E8=& K,%D4430121
T+W1&6)N 8'R 5<G	I5MCM1)PU&+|H2;I	5_¬T2)$N&<GL4'$	W8UCA&(¬R5%¬RO)J	8'R O%N 5=LNO@T	E1D ¬#%D4430122
T+W2.1_XO5DCT2<N	1<XS4U?E5;|E6MC	O5*N 5%R 8@TE&<$	O4'|O9%XN14CO5=|	I5_PS;?E-QDCT5UC	E5;< 'D D4430123
T+W3F1)V 5'XO1'X	A5DCI1|V-QDCT5UC	R1;|U6)N 5<GI5MC	M1)PU5@XD&DA LFA	-1)PT1)V 5'XO1'X	A5D @-4D4430124
T+W4A2*LE5;|E6MC	P2*J 2)N 1<GTOMC	S9%XTO@TE8UC2E4C	3&<GN1DC4K4A 6*P	S1;(8@TE&<TA4=(	8'Q OD<D4430125
T+W4@&<|O5;|I5;L	EK@PN8@PR&+|H1MC	D1;.I6*PD&($P8@X	O5P,19=)-Q+¬X2;I	8@TE&(|I5*N 8'R	O%M 11QD4430126
T+W57&<GL8@PR&|(	-Q+$R2;\|E&(XEO'$	R1DCT5UCD2;.K'WA	-1<XS5'|A:DCN1;¬	T&+.E6+LE5;|IO)(	6*M 41OD4430127
T+W620'$R1DC9QFC	R1;|U6)N 8'R 5<G	I5MCM1)PU1)PT1)V	8@TE&($P8@XO5MC	I5MCT2<N 6*XG2+(	5(Q *L<D4430128
T+W7_8>(O'¬U&<L	A8@E 8>$I8@|H&<G	N1DCR1;.E84CT2<N	2<GL84?U8%N O'¬	U&<LA8@E 8>$S&<$	O6M &YMD4430129
T+W8Y1)PT1)XI5*)	1<GTOP2 O@(-1)P	T1)V 2)N 1<GTOMC	S9>I @MA+&|I 2</	-1)PT1)V 2)N 1<G	TOM =$8D4430130

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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+W9?8>$S&|(' LUC	4&<GN1DCR1;.E84C	HO)|T&<P3K'XRQ<P	N8@PR&<XN&<LA8@E	8>$S&|E LUC2&<G	N1D "PA8D4430131
T+W:;6*PS1;(2<G	L84CE'D?N5)N-1)P	T1)V 2)N O'¬U&+.	W8UC2E4C3&D9 'DC	A5*J 6*PS1;(2<G	L84 O,DD4430132
T+W#R1¬N.1)PT1)V	8@TE&($P8@XO5MC	I5MCDO;|A&+.W&|I	,&(|I5*N ;4CI5MC	DO;|A&+.W6UC3&D9	'D OY&D4430133
T+W@M1_$R&($P8@X	O5MC1&<GN1DCR1;.	E84CT2<N 2<GL84?	K1;TP9(PC2DCN5>(	8>LP5'$R8@PDE4C	5'|* $$8D4430134
T+W'|@MCI8UCN5>(	1<PF2)PE1D_ &(X	EO*LYO<LI8_I 2OG	O&($N&<LX9=¬Y:+X	Z&+$A8UCW6*XT8@P	N$5< NEHD4430135
T+W=H*;O< D Ga	a|CO@|C	O@|C1&DA &DA 5<M	(|E5*¬	T2DCC5>LN84CO9*P	R1_< 7S&D4430136
T+W"E5UA-&(XE8>|	A6;(4)$B5@GR2;|	Y&<PR6)$R&FA 6*P	S1;(@"¬4@MCA5*J	6*PS8@GR84CJ5%.	3'"& :$*D4430137
T+X @MCI8UCN5>(	2)N 8@TE&<XN5=L	T&(LO1<PP9+(2;(	2)N 8@TE&<XN5=L	T&(LO1<N O)PD&(X	E8%M 38UD4430138
T+X #84CT2<N 2<G	L85A& & A C	A a|CO@&		&DA	&D OHHD4430139
T+XA6&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA PDCI5*L	IO@D 9/8D4430140
T+XB18@PS&<.Y8@P	S&<|HO)PG1*LL2)P	E9=) &(XEO'$R1DC	O1UC3@UCB:+|E8UC	I5MCL1)PG8@/ &DA	&D OD8D4430141
T+XC%&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	5_XI1@XNO)(1<G	TOM @2*D4430142
T+XDX5_N 1<XS4%	H14CX94A 2)PD2*|	A8@PS&<.Y8@PS&<|	HO)PG1*J &DA &DA	&DA &DA &DA &DA	&D *Q<D4430143
T+XES&DA &<LA8@E	O;I 2;(9%XL44C	B1MCW6*XT8@PN&+|	O&<LI8_I &<PN8@P	R&<E @MCI5MCR2*¬	H84 ;¬UD4430144
T+XF)5($S84CDO;|	A&+.W&+|O&(XEQ<P	N8@PR&<LA8@E.&<P	N8@PR&<E @UCI5MC	R2*¬H84CM5>.T&<L	A8@D 2:@D4430145
T+XGQ&+.W&<XF&<L	A8@E 2;I O'$R6*P	C84_ 6*PS1;(8@T	E&<TA4=(8'R O'$	N8@XN9<N.P |C	O@| 2:HD4430146
T+XHL@¬G7- D	C & <-A8 74C&	OEVLG_LO9*N/M		C0@|C1	@I*D4430147
T+XI+		- BH H- % C		&DA &DA	&DA &DA &DA &DA	&D 61*D4430148
T+XHI&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&D =QYD4430149
T+X.D&DA &DA &DA	&DA &DA &D	<GC80	CAO=<		|QHD4430150
T+X." C0@DA	&DA &DCO@4A &DC	O'DA &DA &DCO'4A	&DCO=DA &DA &DC	1@MA &DC1@UA &DA	&D 3S8D4430151
T+X<:@¬N &DA @¬R	&DA &DA @¬V &DA	@?A &DA &DA @?|	3@"LO&<$A2)|E1DC	T5UCE9@PC9+|E&<E	8%U $1DD4430152

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OBJECT CARD LISTING

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T+X(55UC1@DCT2)L E8>|H1MCI5*$O6)L A8@XO5MC81)|O9UC I8UCT2<N @?J O>T T1MCD2*GG&+.N8%| A6*& 4ĒHD4430153
T+X+O&(XEO*LE6MC N5>(6*PA1+/ 5_V 1)XR5_V$5=LNO@/ $1)PD5<XS8%XN14C C5_PT6)$L&<|A6*J -9+H ;R&D4430154
T+X|,1MA$5=LNO@/ 5_V O@PM1+LS1MC P6)$G6*GM&<LU54C T5UCP9(PC2DC9'UC C5_|U5(N 1<PC4>I 2OD 4H4D4430155
T+X&W5UCD1;PIO@N 5)$T&<LE1%XN1*J 2)N 9<LT8%PT&+. S9?G7&<$O6MC3'"L 1Ē4CS8>$1=DCF5_V @¬& LJOD4430156
T+XJ/'|I,&+.S9?G A&<$O6MC5'|.4&DA &DA &DA &||7'|E O@GN&($N4=/ O%N 9+.E1DC81MCU8%P D&+Q ¬Ē-D4430157
T+XK*2;|H&+|H1P7 P9(PC2G5 5_¬T2)$ NK@|Y4@XN1<PR&+¬ XĒ4CH1*GD&DCY:F_ 6*PC5_XD&+XZO@| H2(U N$4D4430158
T+XLP6*PN8@PR&(X E0'$R1DCT5UC81MC P9(PC2<PD;_¬I1DC N5>(1_$U5*J &<X N9*GL2*J 6*PC5_X D&(M 7ĒMD4430159
T+XMK9(LB1)V 8%P L1*|T1*J QDCVO)| I1DCR1*|O6*J 5;L MO%PR8UCA6*N @MC T5UC3@<XN9*GL2*J 2<M *B0D4430160
T+XN(O*J 8%PL1*| T1*J QDCVO)|I1DC H1*GD&(PU5<.E6;I O)XE&|A 8'R @¬| T2<XS&<LE0'I 5=L NO@- =2*D4430161
T+XOH1*J 9+.I5*) 5'XO1'XA5DCD'|L I5;PA4@XD&<TE94C N9(LB1)V 1)PT1)X E1DCF5_V 0=TL2)P D1)U 4Q4D4430162
T+XPCQ*TE0*J/6*P C5_XD2|PVO)|I1DC C:(|I5*LE6MCS1)| E0=|E1DA-&+PA4@X D&<|Y4@XN1<PR&(P U5<H #-8D4430163
T+XP=1)XS&<GR1MC O&+|O&|.1@"|4@DC D6*XV1MCX&(PO84C R1*CD:DCO6MCU5*X T&<|H1*|KO*LA5=| E6M $/UD4430164
T+XQ9O@TE0'I 5_N @"|4@DCA0%|D1*$ G2<VHK41(LU'&4). L5(PO5'TROV_*PN9 ¬QFGS8=LV9>¬Y:)A ,$F4 7O&D4430165
TDPR.$W"O@¬.3'|P 6'"T9:X_@¬P9" "=@D4430166
********** ********** ********** ********** ********** **** D4430167
* DIAGNOSTIC UTI LITY * D4430168
* * D4430169
* DISK I/O ON D1-SENSE SWIT CHES 22 WILL SEL ECT D2 * D4430170
* I/O DEVIC E IS DEFINED VIA UDT - OTHERWISE : * D4430171
* SSW17-374 1 OR SSW18-1442 OR SSW1A-5424 * D4430172
* WHERE APP LICABLE, READING IS DONE FROM PR IMARY; PUNCHING FROM SECUNDARY * D4430173
* DATA SWIT CHES ARE NUMBERE D FROM LEFT TO R IGHT STARTING WI TH 1. * D4430174

D443 S/3 3340 AND CARD UTILITIES --- MOD 12

OBJECT CARD LISTING

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

********** ********** ********** ********** ********** **** D4430175
EMHE*E7*=¬DC"PH$ ="7M&F| | C F$ ASC R A SO Q 09480630750 31076J:4D4430176

LAST PAGE

E0A2 ONE CARD RIPPLE PRINT -- MODEL 15

LAST CHG:10 27 74

```
ERR LOC  OBJECT CODE      ADDR STMT SOURCE STATEMENT
                             2 *
                             3         DECK  4
                             4 E0A2    START X'0000'
                        0000 5         USING A,1
                        0000 6         USING A,2
                             7 ********************************************************************************
                             8 *   1 CARD RIPPLE PRINT CHAIN CLEANER
                             9 ********************************************************************************
0000 C2 61 0100              10 A       LA    X'100',XR1          SET BOTH REG.S TO 256
0004 D2 02 00                11         LA    0(,XR1),XR2         SET BOTH REG.S TO 256
0007 74 01 FF                12 LOOP1   ST    255(,XR1),XR1       GENERATE 255 HEX CHARACTERS
000A 36 01 001C              13         A     NEG1,XR1
000E C0 01 0007              14         BNZ   LOOP1
0012 AC 7F 7F FF             15         MVC   127(128,XR2),255(,XR2) PUT 128 IN IMAGE AREA
                             16 *
0016 F3 E0 01                17 LOOP2   SIO   X'01',X'E0'          SPACE 1
0019 6C 83 FF FF             18 LOOP3   MVC   255(132,XR1),255(,XR2) PUT FIELD IN DATA AREA
                        001C 19 NEG1    EQU   *-1
001D 71 E4 03                20         LIO   A+3(,XR1),X'E4'     LOAD IMAGE ADDRESS
0020 71 E6 38                21         LIO   DARA(,XR1),X'E6'    LOAD DATA ADDRESS
0023 F3 E2 00                22         SIO   X'00',X'E2'         PRINT A LINE
0026 D1 E2 26                23 BUSY    TIO   BUSY(,XR1),X'E2'    WAIT FOR BUSY TO DROP
0029 AC 00 78 FF             24         MVC   X'78'(1,XR2),X'FF'(,XR2) RIPPLE THE PRINT FIELD
002D AC 83 FF FE             25         MVC   X'FF'(132,XR2),X'FE'(,XR2)
0031 88 0F 80                26         TBN   X'80'(,XR2),X'0F'   IS THIS THE 16ND LINE?
0034 D0 10 16                27         BT    LOOP2(,XR1)
0037 D0 87 19                28         B     LOOP3(,XR1)
                             29
003A 007C                0038 30 DARA    DC    XL2'007C'           PRINT DATA ADDRESS
                             31 ********************************************************************************
                        0001 32 XR1     EQU   1
                        0002 33 XR2     EQU   2
003C 000000000000       0041 34         DC    XL6'0000'           FILLER TO FORCE COMPLETE IPL CARD
                        0000 35         END   A
```


E0A2 ONE CARD RIPPLE PRINT -- MODEL 15

CROSS-REFERENCE

```
SYMBOL T LEN VALUE  DEFN     REFERENCES
A      A 004 0000   0010     0035  0006  0020  0035
BUSY   A 003 0026   0023     0023
DARA   A 002 0038   0030     0021
E0A2   A 001 0000   0004
LOOP1  A 003 0007   0012     0014
LOOP2  A 003 0016   0017     0027
LOOP3  A 004 0019   0018     0028
NEG1   A 001 001C   0019     0013
XR1    C 001 0001   0032     0010* 0011  0012  0012  0013* 0018  0020  0021  0023  0027  0028
XR2    C 001 0032   0033     0011* 0015  0015  0018  0024  0024  0025  0025  0026
```

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

E0A2 ONE CARD RIPPLE PRINT -- MODEL 15

LAST PAGE

```
LOC. OBJECT CODE      STM      SOURCE STATEMENT

          OPTION XREF
          PRINT  GEN
          COPY       LEVEL12
        RELIN  PN=4247622
        RELIN  EC=827848
      * LISTING PN=4247623
      *
      *--------------------------------------------------------------*
      *--------------------------------------------------------------*
      *                                                              *
      *                                                              *
      *          33333333     33333333       4444     00000000       *
      *                33           33     44  44     00    00       *
      *              3339        33333   444444444    00    00       *
      *                33           33         44     00    00       *
      *          33333333     33333333         44     00000000       *
      *                                                              *
      *                                                              *
      *--------------------------------------------------------------*
      *--------------------------------------------------------------*
              END COPY-MEMBER LEVEL12
          COPY       INDEX12
      *---------------------------------------------------------------
      *                                                              |
      * I N D E X   T O   T H I S   L I S T I N G          1 1 / 0 5 / 7 5|
      *                                                              |
      *--------------------------------------------------------------|
      *  C S E C T          | D E F I N I T I O N                    |
      *--------------------------------------------------------------|
      *                     |                                        |
      *  REGISTER           | DESCRIPTION OF REGISTER ASSIGNMENTS    |
      *                     |                                        |
      *  CSASSGN            | DESCRIPTION OF CONTROL STORE ALLOCATION|
      *                     |                                        |
      *  HANDBOOK           | SENSE INFORMATION SUMMARY              |
      *                     |                                        |
      *  EQUATES            | EXT AND LOCAL REGISTER BIT ASSIGNMENTS & MISC|
      *                     |                                        |
      *  TRS12              | RESET ROUTINE                          |
      *                     |                                        |
      *  TCU12              | CLEANUP                                |
      *                     |                                        |
      *  TDS                | DEFECT SKIPPING & TRACK OVERFLOW ANALYSIS |
      *                     |                                        |
      *  TDX                | INDEX PROCESSING                       |
      *                     |                                        |
      *  STORAGE            | DC'S FOR DATA BUFFERS,SAVE AREAS,CNTRL BLOCKS|
      *                     |                                        |
      *  TEF                | END OF FIELD PROCESSING                |
      *                     |                                        |
      *  TEN12              | END PROCEDURE                          |
      *                     |                                        |
      *  TER                | ERROR ANALYSIS                         |
      *                     |                                        |
      *  TFE                | FORCE ERROR ROUTINE                    |
      *                     |                                        |
      *  TIO12              | START I/O PROCESSING                   |
      *                     |                                        |
      *  TIP12              | IDLE LOOP                              |
      *                     |                                        |
      *  TRD12              | READ COMMANDS                          |
      *                     |                                        |
      *  TSC12              | SEARCH COMMANDS                        |
      *                     |                                        |
      *  TSK                | CONTROL COMMANDS                       |
      *                     |                                        |
      *  TSN12              | SENSE DATA ASSEMBLY                    |
      *                     |                                        |
      *  TWR12              | WRITE COMMANDS                         |
      *                     |                                        |
```



```
LOC. OBJECT CODE      STM      SOURCE STATEMENT

      * ----------------------------------------------------------------
              END COPY-MEMBER INDEX12
          COPY       REGISTER
      ******************************************************************
      * 3 3 4 0     R E G I S T E R   A S S I G N M E N T S  1 2 / 1 0 / 7 4*
      *                    *                    *                      *
      * EXTERNAL SENSE  REG * EXTERNAL  CNTRL REG  * LOCAL DSA REG      *
      ******************************************************************
      * FTI- FILE TAGS IN   * DXC- DATA XFER CONTRLS* LO-L8- WORK REGISTERS*
      *                    *                    *                      *
      * HES- HDWR ERROR SENSE* FTG- FILE TAG GATE  * GEN1-  UPGM MARKS   *
      *                    *                    *                      *
      * ADS- ADPTR DIAG SENSE* FTR- FILE TRAP RESET * UNCK-  UNIT CHK MARKS*
      *                    *                    *                      *
      * FBI- FILE BUS IN    * SCN- SCAN OP CONTROL * STAT-  STATUS BYTE  *
      *                    *                    *                      *
      * CO2- CHANNEL OUT    * FHF- FILE HDWR FLAGS * GSY/-  Q-BYTE       *
      *                    *                    *                      *
      *                    * BOO- CHANNEL IN     * RBYT-  R-BYTE       *
      *                    *                    *                      *
      *                    * DST- DEVICE STATUS  * PAC-   PHYS ADDR CYL *
      *                    *                    *                      *
      *                    * FBO- FILE BUS OUT   * PAH-   PHYS ADDR HEAD*
      *                    *                    *                      *
      *                    * FTO- FILE TAG OUT   * ZER-   ZERO, WORK REG*
      *                    *                    *                      *
      *                    * FCT- FILE BYTE COUNTER* CEB1-  UPGM MARKS   *
      *                    *                    *                      *
      *                    * CCH- CHNL BUFR CNT HI * CEB2-  UPGM MARKS   *
      *                    *                    *                      *
      *                    * CCL- CHNL BUFR CNT LO * MSC1-  UPGM MARKS   *
      *                    *                    *                      *
      *                    * SBO- SENSE BYTE 0   * MSC2-  UPGM MARKS   *
      *                    *                    *                      *
      *                    * SB1- SENSE BYTE 1   * FLAG-  DDCF FLAG    *
      *                    *                    *                      *
      *                    *                    * CHI-   DDCF CYL HI   *
      *                    *                    *        (3340)        *
      *                    *                    * CLO-   DDCF CYL LO   *
      *                    *                    *        (3340)        *
      *                    *                    * HEAD-  DDCF HEAD     *
      *                    *                    *        (3340)        *
      *                    *                    * REC-   DDCF RECORD   *
      *                    *                    *                      *
      *                    *                    * KCNT-  DDCF KEY COUNT*
      *                    *                    *                      *
      *                    *                    * DCNT-  DDCF DATA CNT *
      *                    *                    *                      *
      *                    *                    * NREC-  DDCF NUMBER   *
      *                    *                    *                      *
      *                    *                    * SDH-   SKP DISP      *
      *                    *                    *        (FROM FILE)   *
      *                    *                    * SDL-   SKP DISP      *
      *                    *                    *        (FROM FILE)   *
      *                    *                    * FFLG-  FLAG TO FILE  *
      ******************************************************************
      ******************************************************************
      *      E X T E R N A L   S E N S E   R E G I S T E R S           *
      ******************************************************************
      *     *   0   *   1   *   2   *   3   *   4   *   5   *   6   *   7   *
      ******************************************************************
      *     * SELECT*  TAG  * CHECK *  CE   * NORMAL* SYNC  * INDEX * ERROR *
      * FTI * ACTIVE* VALID *  END  * ALERT *  END  *  IN   * LATCH * ALERT *
      *     *       *       *       *       *       *       *       *       *
      ******************************************************************
      *     * CYCLE * CIO/1 * CHAN  *       *ADAPTER*       *       *  RCS  *
      * HES * STEAL * PARITY* XFER  *       * CHECK *       *       * PARITY*
      *     *OVERRUN* CHECK * CHECK *       *       *       *       * CHECK *
      ******************************************************************
      *     * SYNC  *       * TIME  * FILE  *  FBO  *  FTO  *       *  FBI  *
```

```
LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       145 * ADS * OUT   *RECYCLE*  OUT  * XFER  * PARITY* PARITY*       * PARITY*
                       146 *     *       *        *       * CHECK * CHECK * CHECK *       * CHECK *
                       147 ***************************************************************************
                       148 *     *                                                                   *
                       149 * FBI *       F I L E   B U S   I N                                       *
                       150 *     *                                                                   *
                       151 ***************************************************************************
                       152 *     *                                                                   *
                       153 * CO2 *       C H A N N E L   O U T   (S/3 DATA BUS OUT 0)                 *
                       154 *     *                                                                   *
                       155 ***************************************************************************
                       157 ***************************************************************************
                       158 *     E X T E R N A L   C O N T R O L   R E G I S T E R S                   *
                       159 ***************************************************************************
                       160 *     *   0   *   1   *   2   *   3   *   4   *   5   *   6   *   7   *
                       161 ***************************************************************************
                       162 *     * DATA  *CHANNEL* LSR/  *LSR SEL* ALLOW * ALLOW *  SUB-  *CHANNEL*
                       163 * DXC *TO/FROM*  ODD  *DATA CY* DDDR/ *DIF CTR*DIF CTR* TRACT * 1 BYTE*
                       164 *     *CHANNEL*TRANSFR*STL REQ*  DDCR *  CHAN *  FILE *        *TRANSFR*
                       165 ***************************************************************************
                       166 *     * FILE  * SELECT* FORCE * GATE  * FILE  * DIAG  * DIAG  * ALLOW *
                       167 * FTG * TAG   *  HOLD *  RE-  *BUS IN *RESPONS*FBO-FBI*SYNC IN*  FBI  *
                       168 *     * GATE  *       * CYCLE * TO FI * GATE  *FBO-FIO*       * CHECK *
                       169 ***************************************************************************
                       170 *     *ADAPTER*  I/O  *  D M  * I/O   *DISABLE*       * INVERT* INDEX *
                       171 * FTR * CHECK * ATTEN-* ATTEN-*CONDI- * ERROR *       * PARITY*ENABLE/*
                       172 *     * RESET *  TION  *  TION *TION B * TRAP  *       *       * RESET *
                       173 ***************************************************************************
                       174 *     * SCAN  * SCAN  * SCAN  * LAST  * ALLOW * FILE  * DATA  *INHIBIT*
                       175 * SCN * READ  *HI EQ/ * SPLIT *RECORD *  FILE *  ODD  *TO/FROM* FILE/ *
                       176 *     *  OR   * EQUAL * FIELD *       *  XFER * XFER  *  FILE *CS XFER*
                       177 ***************************************************************************
                       178 *     *SYSTEM/* CHECK * FORCE *       *END OF * SCAN  * SCAN  *END OF *
                       179 * FHF * PWR ON* RESET * ERROR *       * TRAP  *SATIS- * EQUAL *FLE DAT*
                       180 *     * RESET * CHAN  * MODE  *       * COUNT * FIED  *       * XFER  *
                       181 ***************************************************************************
                       182 *     *ATTACH * DIFF  *END OF * ALLOW * DRIVE * DRIVE * DRIVE * DRIVE *
                       183 * DST * BUSY  *COUNTER*CHL DAT*CHANNEL* 1 SEEK* 2 SEEK* 3 SEEK* 4 SEEK*
                       184 *     *       * ZERO  *  XFER *  XFER *CMPLETE*CMPLETE*CMPLETE*CMPLETE*
                       185 ***************************************************************************
                       186 *     *                                                                   *
                       187 * FBO *       F I L E   B U S   O U T                                     *
                       188 *     *                                                                   *
                       189 ***************************************************************************
                       190 *     *                                                                   *
                       191 * FTO *       F I L E   T A G   O U T                                     *
                       192 *     *                                                                   *
                       193 ***************************************************************************
                       194 *     *                                                                   *
                       195 * FCT *       F I L E   B Y T E   C O U N T E R                           *
                       196 *     *                                                                   *
                       197 ***************************************************************************
                       199 ***************************************************************************
                       200 *     E X T E R N A L   C O N T R O L   R E G I S T E R S   (CONT'D)       *
                       201 ***************************************************************************
                       202 *     *                                                                   *
                       203 * CCH *       C H A N N E L   B U F F E R   C O U N T E R   H I G H       *
                       204 *     *                                                                   *
                       205 ***************************************************************************
                       206 *     *                                                                   *
                       207 * CCL *       C H A N N E L   B U F F E R   C O U N T E R   L O W         *
                       208 *     *                                                                   *
                       209 ***************************************************************************
                       210 *     *DRIVE 1*DRIVE 2*DRIVE 3*DRIVE 4*DRIVE 1*DRIVE 2*DRIVE 3*DRIVE 4*
                       211 * SBO *NT RDY/*NT RDY/*NT RDY/*NT RDY/* SEEK  * SEEK  * SEEK  * SEEK  *
                       212 *     *UNIT CHK*UNT CHK*UNT CHK*UNIT CHK* BUSY  * BUSY  * BUSY  * BUSY  *
                       213 ***************************************************************************
                       214 *     *RESERVD* SCAN  *REMOVE-*  OP   *  NO   *  DM   *       *ADAPTER*
                       215 * SB1 * DIAG- * EQUAL * ABLE  *  END  *  OP   * ATTN  *       * CHECK *
                       216 *     *NOSTICS*       * DRIVE *       *       *(FTR 2)*       *IOP HLT*
```



```
LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       217 ***************************************************************************
                       218 *     *                                                                   *
                       219 * BOO *       C H A N N E L   B U S   I N   (S/3 CHNL BUS IN 0)           *
                       220 *     *                                                                   *
                       221 ***************************************************************************
                       223 ***************************************************************************
                       224 *     S E C O N D A R Y   L O C A L   R E G I S T E R S                   *
                       225 ***************************************************************************
                       226 *     *   0   *   1   *   2   *   3   *   4   *   5   *   6   *   7   *
                       227 ***************************************************************************
                       228 *     * STACK * FINISH*  RE-  * XFER  * XFER  * RD/HR *UPDATE *  FILE *
                       229 * GEN1*  CMD  *  CHAN * STORE *  HA/  * DDDF  *  TAG  * READ  *ODD XFR*
                       230 *     *PENDING*  XFER *  DDCF * COUNT *       *  UP   * USAGE * SWITCH*
                       231 ***************************************************************************
                       232 *     * INTV  * INTV  * INTV  * INTV  * CNTR  * CNTR  * CNTR  * CNTR  *
                       233 * UNCK* REQD  * REQD  * REQD  * REQD  * OVFLOW* OVFLOW* OVFLOW* OVFLOW*
                       234 *     * DRV 1 * DRV 2 * DRV 3 * DRV 4 * DRV 1 * DRV 2 * DRV 3 * DRV 4 *
                       235 ***************************************************************************
                       236 *     * ERROR * SCAN  *       *  OP   *  NO   *       * UNIT  * SEEK  *
                       237 * STAT*ROUTINE* EQUAL *       *  END  *  OP   *       * CHECK *CMPLETE*
                       238 *     * RETURN*       *       *       *       *       *       *       *
                       239 ***************************************************************************
                       240 *     *                                                                   *
                       241 * QBYT*     Q - B Y T E   F O R   C U R R E N T   O P E R A T I O N       *
                       242 *     *                                                                   *
                       243 ***************************************************************************
                       244 *     *                                                                   *
                       245 * RBYT*     R - B Y T E   F O R   C U R R E N T   O P E R A T I O N       *
                       246 *     *                                                                   *
                       247 ***************************************************************************
                       248 *     *                                                                   *
                       249 * PAC *       P H Y S I C A L   A D D R E S S   C Y L I N D E R           *
                       250 *     *                                                                   *
                       251 ***************************************************************************
                       252 *     *                                                                   *
                       253 * PAH *       P H Y S I C A L   A D D R E S S   H E A D                   *
                       254 *     *                                                                   *
                       255 ***************************************************************************
                       257 ***************************************************************************
                       258 *     P R I M A R Y   L O C A L   R E G I S T E R S                       *
                       259 ***************************************************************************
                       260 *     *   0   *   1   *   2   *   3   *   4   *   5   *   6   *   7   *
                       261 ***************************************************************************
                       262 *     *                                                                   *
                       263 * ZER * NORMALLY A VALUE OF ZERO, ALSO USED AS A SPECIAL WORK REGISTER     *
                       264 *     *                                                                   *
                       265 ***************************************************************************
                       266 *     *RO CNT *FORMAT * WRITE *  PAD  *PROCESS*PROCESS*PROCESS*PROCESS*
                       267 * CEB1*  TO   * WRITE *ENABLED*  TO   *  RO   * COUNT *  KEY  *  DATA *
                       268 *     * DDDF  *       *       * INDEX * COUNT *       *       *       *
                       269 ***************************************************************************
                       270 *     *       *       *       * HEAD  * ALLOW *                           *
                       271 * CEB2*  READ * SEARCH* WRITE *SWITCH-* WRITE *TRACK ORIENTATION MARKS*
                       272 *     *       *       *       *   ED  *  HA   * (SEE NOTE1 ON PAGE 9) *
                       273 ***************************************************************************
                       274 *     * READ  *MULTIPL*MULTIPL*       * INDEX * INDEX * ERASE * TRACK *
                       275 * MSC1* SENSE * TRK   *RECORD *       * PASSED* PASSED*  TO   *OVRFLOW*
                       276 *     *  CMD  *       *       *       * TWICE * ONCE  * INDEX *       *
                       277 ***************************************************************************
                       278 *     * SCAN  * DDCR  * DDDR  *       * DATA  * 12MB  * KL+DL * DATA  *
                       279 * MSC2* SWITCH* ODD   * ODD   *       *LENGTH * DATA  *  >256 *LENGTH *
                       280 *     *       *       *       *       *  = 0  * MODULE*       *  256  *
                       281 ***************************************************************************
                       282 *     * COUNT * KEY   * DATA  *       * OVFL  *COMPRES*  DEF  *  ALT  *
                       283 * FLAG* DEFECT* DEFECT* DEFECT*       *RECORD * DATA  * TRACK * TRACK *
                       284 *     *       *       *       *       *(S/370)* (S/3)  *       *       *
                       285 ***************************************************************************
                       286 *     *                                                                   *
                       287 * CHI *           C Y L I N D E R   H I G H   ( 3 3 4 0 )                 *
                       288 *     *                                                                   *
```

```
LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       289 ********************************************************************************
                       290 *     *                                                                        *
                       291 * CLO *            C Y L I N D E R   L O W   ( 3 3 4 0 )                       *
                       292 *     *                                                                        *
                       293 ********************************************************************************
                       294 *     *                                                                        *
                       295 * HEAD*            H E A D   ( 3 3 4 0 )                                       *
                       296 *     *                                                                        *
                       297 ********************************************************************************
                       298 *     *                                                                        *
                       299 * REC *            R E C O R D   N U M B E R                                   *
                       300 *     *                                                                        *
                       301 ********************************************************************************
                       302 *     *                                                                        *
                       303 * KCNT*            K E Y   C O U N T                                           *
                       304 *     *                                                                        *
                       305 ********************************************************************************
                       306 *     *                                                                        *
                       307 * DCNT*            D A T A   C O U N T                                         *
                       308 *     *                                                                        *
                       309 ********************************************************************************
                       311 ********************************************************************************
                       312 *     P R I M A R Y   L O C A L   R E G I S T E R S   (CONTINUED)              *
                       313 ********************************************************************************
                       314 *     *                                                                        *
                       315 * NREC*            N U M B E R   O F   R E C O R D S                           *
                       316 *     *                                                                        *
                       317 ********************************************************************************
                       318 *     *                                                                        *
                       319 * SDH *      S K I P   D I S P L A C E M E N T   H I G H                       *
                       320 *     *           ( F R O M   F I L E )                                        *
                       321 ********************************************************************************
                       322 *     *                                                                        *
                       323 * SDL *      S K I P   D I S P L A C E M E N T   L O W                         *
                       324 *     *           ( F R O M   F I L E )                                        *
                       325 ********************************************************************************
                       326 *     * COUNT * KEY   * DATA  *       * OVFL  *COMPRES*  DEF  * ALT  *
                       327 * FFLG* DEFECT* DEFECT* DEFECT*       *RECORD * DATA  * TRACK * TRACK *
                       328 *     *       *       *       *       *(S/370)* (S/3) *       *      *
                       329 ********************************************************************************
                       330 ********************************************************************************
                       331 *   NOTE1 :  TRACK ORIENTATION MARKS DEFINE AS FOLLOWS
                       332 *                  0 0 0 -- END OF HA
                       333 *                  0 0 1 -- END OF RO COUNT
                       334 *                  0 1 0 -- END OF KEY
                       335 *                  0 1 1 -- END OF DATA
                       336 *                  1 0 0 -- END OF COUNT
                       337 *                  1 1 0 -- END OF 1ST SEGMENT KEY
                       338 *                  1 1 1 -- END OF 1ST SEGMENT DATA
                       339 ********************************************************************************
                       341          END COPY-MEMBER REGISTER
                       342       COPY     CSASSGN
                       343 ********************************************************************************
                       344 * C O N T R O L   S T O R E   A L L O C A T I O N S     7/16/74*
                       345 ********************************************************************************
                       346 *  C S   A D D R E S S *      L A B E L      *    C O M M E N T S    *
                       347 ** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * **
                       348 *  0 5 0 0 - 0 5 0 7   * DDCFORGL DC 8X'00'    * COUNT BUFFER--LEFT       *
                       349 *                      *                       *                          *
                       350 *  0 5 0 8 - 0 5 0 9   * DSDISP1  DC 2X'00'    * 212+(KL+75)+DL           *
                       351 *                      *                       *                          *
                       352 *  0 5 0 A - 0 5 0 B   * DSDISP2  DC 2X'00'    * SHORT=139/LONG=126+KL    *
                       353 *                      *                       *                          *
                       354 *  0 5 0 C - 0 5 0 D   * DSDISP3  DC 2X'00'    * SHORT=139/LONG=126+DL    *
                       355 *                      *                       *                          *
                       356 *  0 5 0 E - 0 5 0 F   * TRKCNTR  DC 2X'00'    * TRACK CAPACITY CNTR      *
                       357 *                      *                       *                          *
                       358 *  0 5 1 0 - 0 5 1 2   * RECLNG   DC 2X'00'    * RECORD LENGTH CONST      *
                       359 *                      *                       *                          *
                       360 *  0 5 1 2 - 0 5 1 3   * DDDRORG  DC 2X'00'    * ORIGINAL DDDR            *
```



```
LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       361 *                      *                       *                          *
                       362 *  0 5 1 4 - 0 5 1 5   * DDCRORG  DC 2X'00'    * ORIGINAL DDCR            *
                       363 *                      *                       *                          *
                       364 *  0 5 1 6 - 0 5 1 7   * BYTEREAD DC 2X'00'    * TOTAL BYTES READ         *
                       365 *                      *                       *                          *
                       366 *  0 5 1 8 - 0 5 1 9   * TSKPA    DC 2X'00'    * CURRENT PA FOR SEEK      *
                       367 *                      *                       *                          *
                       368 *  0 5 1 A - 0 5 1 B   * SDFORHA  DC 2X'00'    * SKIP DISP FOR WR HA      *
                       369 *                      *                       *                          *
                       370 *  0 5 1 C - 0 5 1 D   * SCANSTOR DC 2X'00'    * SAVE AREA FOR SCAN       *
                       371 *                      *                       *                          *
                       372 *  0 5 1 E             * UCWPTR   DC X'00'      * ACTIVE UCW POINTER       *
                       373 *                      *                       *                          *
                       374 *  0 5 1 F             * SKMARK1  DC X'00'      * SK IN PROG/SK INCOMPL     *
                       375 *                      *                       *                          *
                       376 *  0 5 2 0             * SKMARK2  DC X'00'      * JUST RST SK BUSY(4-7)     *
                       377 *                      *                       *                          *
                       378 *  0 5 2 1             * SVPOPT   DC X'00'      * SVP REQ OPTION BYTE       *
                       379 *                      *                       *      (SEE NOTE 1)        *
                       380 *  0 5 2 2 - 0 5 2 3   * SBFLAGS  DC 2X'00'    * SEEK TIMER               *
                       381 *                      *                       *                          *
                       382 *  0 5 2 4             * CNTCNTR  DC X'00'      * COUNT FIELD COUNTER      *
                       383 *                      *                       *                          *
                       384 *  0 5 2 5 - 0 5 3 9   * RESAREA1 DC 21X'00'   * *******RESERVED*****    *
                       385 *                      *                       *                          *
                       386 *  0 5 3 A             * EFSENSEL DC X'00'      * EXTENDED FUNCT SENSE     *
                       387 *                      *                       *                          *
                       388 *  0 5 3 B             * CSZEROL  DC X'00'      * BYTE OF ZERO             *
                       389 *                      *                       *                          *
                       390 *  0 5 3 C - 0 5 5 3   * D1SENSE  DC 24X'00'   * DRIVE 1--SENSE          *
                       391 *                      *                       *                          *
                       392 *  0 5 5 4 - 0 5 5 5   * D1CURPA  DC 2X'00'    * DRIVE 1--CURRENT PA      *
                       393 *                      *                       *                          *
                       394 *  0 5 5 6 - 0 5 5 7   * D1OLDPA  DC 2X'00'    * DRIVE 1--OLD PA          *
                       395 ********************************************************************************
                       397 ********************************************************************************
                       398 *  C S   A D D R E S S *      L A B E L      *    C O M M E N T S    *
                       399 ** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * **
                       400 *                      *                       *                          *
                       401 *  0 5 5 8 - 0 5 5 B   * D1RDCNT  DC 4X'00'    * DRIVE 1--RD USAGE CNT    *
                       402 *                      *                       *                          *
                       403 *  0 5 5 C - 0 5 5 D   * D1SKCNT  DC 2X'00'    * DRIVE 1--SK USAGE CNT    *
                       404 *                      *                       *                          *
                       405 *  0 5 5 E - 0 5 7 5   * D2SENSE  DC 24X'00'   * DRIVE 2--SENSE          *
                       406 *                      *                       *                          *
                       407 *  0 5 7 6 - 0 5 7 7   * D2CURPA  DC 2X'00'    * DRIVE 2--CURRENT PA      *
                       408 *                      *                       *                          *
                       409 *  0 5 7 8 - 0 5 7 9   * D2OLDPA  DC 2X'00'    * DRIVE 2--OLD PA          *
                       410 *                      *                       *                          *
                       411 *  0 5 7 A - 0 5 7 D   * D2RDCNT  DC 4X'00'    * DRIVE 2--RD USAGE CNT    *
                       412 *                      *                       *                          *
                       413 *  0 5 7 E - 0 5 7 F   * D2SKCNT  DC 2X'00'    * DRIVE 2--SK USAGE CNT    *
                       414 *                      *                       *                          *
                       415 *  0 5 8 0 - 0 5 8 7   * DDCFORGR DC 8X'00'    * COUNT BUFFER--RIGHT      *
                       416 *                      *                       *                          *
                       417 *  0 5 8 8             * ORGREC   DC X'00'      * ORIGINAL REC NUMBER      *
                       418 *                      *                       *                          *
                       419 *  0 5 8 9 - 0 5 B 9   * REVAREA2 DC 49X'00'   * *******RESERVED*****    *
                       420 *                      *                       *                          *
                       421 *  0 5 B A             * EFSENSER DC X'00'      * EXTENDED FUNCT SENSE     *
                       422 *                      *                       *                          *
                       423 *  0 5 B B             * CSZEROR  DC X'00'      * BYTE OF ZERO             *
                       424 *                      *                       *                          *
                       425 *  0 5 B C - 0 5 D 3   * D3SENSE  DC 24X'00'   * DRIVE 3--SENSE          *
                       426 *                      *                       *                          *
                       427 *  0 5 D 4 - 0 5 D 5   * D3CURPA  DC 2X'00'    * DRIVE 3--CURRENT PA      *
                       428 *                      *                       *                          *
                       429 *  0 5 D 6 - 0 5 D 7   * D3OLDPA  DC 2X'00'    * DRIVE 3--OLD PA          *
                       430 *                      *                       *                          *
                       431 *  0 5 D 8 - 0 5 D B   * D3RDCNT  DC 4X'00'    * DRIVE 3--RD USAGE CNT    *
```

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LOC.  OBJECT CODE      STM        SOURCE STATEMENT

                       432 *                    *                        *                     *
                       433 *  0 5 D C - 0 5 D D  * D3SKCNT  DC 2X'00'     * DRIVE 3--SK USAGE CNT*
                       434 *                    *                        *                     *
                       435 *  0 5 D E - 0 5 F 5  * D4SENSE  DC 24X'00'    * DRIVE 4--SENSE       *
                       436 *                    *                        *                     *
                       437 *  0 5 F 6 - 0 5 F 7  * D4CURPA  DC 2X'00'     * DRIVE 4--CURRENT PA  *
                       438 *                    *                        *                     *
                       439 *  0 5 F 8 - 0 5 F 9  * D4OLDPA  DC 2X'00'     * DRIVE 4--OLD PA      *
                       440 *                    *                        *                     *
                       441 *  0 5 F A - 0 5 F D  * D4RDCNT  DC 4X'00'     * DRIVE 4--RD USAGE CNT*
                       442 *                    *                        *                     *
                       443 *  0 5 F E - 0 5 F F  * D4SKCNT  DC 2X'00'     * DRIVE 4--SK USAGE CNT*
                       444 *                    *                        *                     *
                       445 ** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * **
                       446 *                    *                        *                     *
                       447 *  0 6 0 0  - 0 6 F F * DDDFORG  DC 256X'00'   * DDDF BUFFER          *
                       448 *                    *                        *                     *
                       449 ****************************************************************************
                       451 ****************************************************************************
                       452 * NOTE 1:  SVP REQUEST OPTION BYTE DEFINE AS FOLLOWS:                     *
                       453 *                    BIT 0 --  ALLOW OPERATION ON 12MB DATA MODULE      *
                       454 *                    BIT 1 --  ALLOW SEEK TO CE TRACKS                  *
                       455 *                    BIT 2 --  FORCE SYSTEM RESET                       *
                       456 *                    BIT 4 --  FORCE WRITE HOME ADDRESS                 *
                       457 ****************************************************************************
                       459        END COPY-MEMBER CSASSGN
                       460     COPY      HANDBOOK
                       461 * NOTE: FOR DETAILED SENSE INFORMATION SEE FUNCTIONAL SPECIFICATION
                       462 *
                       463 * SENSE INFORMATION SUMMARY
                       464 *
                       465 * BYTE           BIT        SENSE INFORMATION SUMMARY
                       466 *------------------------------------------------------------------
                       467 *                 0         COMMAND REJECT
                       468 *                 1         INTERVENTION REQUIRED
                       469 *                 2         UNUSED
                       470 *   0             3         EQUIPMENT CHECK
                       471 *                 4         DATA CHECK
                       472 *                 5         OVERRUN
                       473 *                 6         TRACK CONDITION CHECK
                       474 *                 7         SEEK CHECK
                       475 *------------------------------------------------------------------
                       476 *                 0         UNUSED
                       477 *                 1         INVALID TRACK FORMAT
                       478 *                 2         END OF CYLINDER
                       479 *   1             3         UNUSED
                       480 *                 4         NO RECORD FOUND
                       481 *                 5         FILE PROTECTED
                       482 *                 6         WRITE INHIBITED
                       483 *                 7         OPERATION INCOMPLETE
                       484 *------------------------------------------------------------------
                       485 *                 0         RPS FEATURE PRESENT
                       486 *                 1         CORRECTABLE
                       487 *                 2         UNUSED
                       488 *   2             3         ENVIRONMENTAL DATA PRESSENT
                       489 *                 4         UNUSED
                       490 *                 5         UNUSED
                       491 *                 6         DATA MODULE SIZE
                       492 *                 7         DATA MODULE SIZE
                       493 *------------------------------------------------------------------
                       494 *   3           R-BYTE
                       495 *
                       496 *------------------------------------------------------------------
                       497 *   4           Q-BYTE
                       498 *
                       499 *------------------------------------------------------------------
                       500 *   5           CYLINDER LOW
                       501 *
                       502 *------------------------------------------------------------------
                       503 *   6           CYLINDER HIGH  &  HEAD
```



```
LOC.  OBJECT CODE      STM        SOURCE STATEMENT

                       504 *
                       505 *---------------------------------------------------
                       506 *    7            FORMAT (BITS 0-3)
                       507 *                 MESSAGE (BITS 4-7)
                       508 *---------------------------------------------------
                       510 *        SENSE FORMAT SUMMARY
                       511 *
                       512 *-----------------------------------------------------------------------
                       513 *FORMAT   0      1        2       3          4        5        6
                       514 *-----------------------------------------------------------------------
                       515 *BYTE 8   0  FILE        HES     0          C        C        BYTES
                       516 *            STATUS                                           READ
                       517 *        ---------------------------------------------------------------
                       518 *BYTE 9   0  DRIVE       ADS     0          C        C        BYTES
                       519 *            CHK/STAT                                         READ
                       520 *        ---------------------------------------------------------------
                       521 *BYTE 10  0  DATA MOD.   FTI     0          H        H        BYTES
                       522 *            SEQ CNTL                                         READ
                       523 *        ---------------------------------------------------------------
                       524 *BYTE 11  0  ACCESS      DST     0          H        H        BYTES
                       525 *            ERRORS                                           READ
                       526 *        ---------------------------------------------------------------
                       527 *BYTE 12  0  RD/WR       FHF     0          R        R        0
                       528 *            SAFETY
                       529 *        ---------------------------------------------------------------
                       530 *BYTE 13  0  CTL INFC    FBO     0          0        0        0
                       531 *            BUS OUT
                       532 *        ---------------------------------------------------------------
                       533 *BYTE 14  0  CTL INFC    FBI     0          0        0        0
                       534 *            BUS IN
                       535 *        ---------------------------------------------------------------
                       536 *BYTE 15  0  CTL INFC    FTO     0          0        0        0
                       537 *            TAG BUS
                       538 *        ---------------------------------------------------------------
                       539 *BYTE 16  0  SET READ    SCN     0          0     RESTART   SEEKS
                       540 *              /WRITE                             DISPL.    CNTR
                       541 *        ---------------------------------------------------------------
                       542 *BYTE 17  0  CNTLR       DXC     0          0     RESTART   SEEKS
                       543 *            CHECKS                               DISPL.
                       544 *        ---------------------------------------------------------------
                       545 *BYTE 18  0  UPGM DETEC  0       0          0     ERROR     0
                       546 *            ERRORS                               DISP.
                       547 *        ---------------------------------------------------------------
                       548 *BYTE 19  C  CNTLR       0       0          0     ERROR     0
                       549 *            INFC CHKS                            DISP.
                       550 *        ---------------------------------------------------------------
                       551 *BYTE 20  0  DEVICE      0       0          0     PTTRN     0
                       552 *            INFC CHKS                            HIGH
                       553 *        ---------------------------------------------------------------
                       554 *BYTE 21  0      0       0        0         0     PTTRN     0
                       555 *                                                 LOW
                       556 *        ---------------------------------------------------------------
                       557 *BYTE 22  0    SYMP.     0        0     SYMP.      0        0
                       558 *              CODE                     CODE
                       559 *        ---------------------------------------------------------------
                       560 *BYTE 23  0    SYMP.     0        0     SYMP.      0        0
                       561 *              CODE                     CODE
                       562 *        ---------------------------------------------------------------
                       564 *  FORMAT 1
                       566 *      1000       INVALID DEVICE INTERFACE CHECK
                       567 *      1001       DEVICE TAG BUS PARITY CHECK
                       568 *      1002       DEVICE BUS OUT PARITY CHECK
                       569 *      1003       DEVICE TAG AND BUS OUT PARITY CHECKS
                       571 *      1100       DM SEQ CHECK IN STATE 0
                       572 *      1110       DM SEQ CHECK IN STATE 1
                       573 *      1120       DM SEQ CHECK IN STATE 2
                       574 *      1130       DM SEQ CHECK IN STATE 3
                       575 *      1140       DM SEQ CHECK IN STATE 4
                       576 *      1150       DM SEQ CHECK IN STATE 5
                       577 *      1160       DM SEQ CHECK IN STATE 6
```

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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       578 *     1170     DM SEQ CHECK IN STATE 7
                       579 *     11FF     DM SIZE CHECK AND DM SEQ CHECK
                       581 *     1200     ACCESS TIMEOUT DURING RECAL-STATE 0-'MOVE OUT'
                       582 *     1201     ACCESS TIMEOUT DURING RECAL-STATE 1-'RESET'
                       583 *     1202     ACCESS TIMEOUT DURING RECAL-STATE 2-'MOVE IN'
                       584 *     1203     ACCESS TIMEOUT - INVALID CONTROL STATE
                       585 *     1204     ACCESS TIMEOUT - INVALID CONTROL STATE
                       586 *     1205     ACCESS TIMEOUT - INVALID CONTROL STATE
                       587 *     1206     ACCESS TIMEOUT DURING RECAL-STATE 6-'LINEAR MODE'
                       588 *     1207     ACCESS TIMEOUT - INVALID CONTROL STATE
                       589 *     1208     ACCESS TIMEOUT DURING SEEK-STATE 8-'DECELERATE'
                       590 *     1209     ACCESS TIMEOUT - INVALID CONTROL STATE
                       591 *     120A     ACCESS TIMEOUT DURING SEEK-STATE A-'ACCELERATE'
                       592 *     120B     ACCESS TIMEOUT - INVALID CONTROL STATE
                       593 *     120C     ACCESS TIMEOUT DURING SEEK-STATE C-'LINEAR MODE TO ONTRK'
                       594 *     120D     ACCESS TIMEOUT - INVALID CONTROL STATE
                       595 *     120E     INVALID TIMEOUT - STATE E - 'ON TRACK'
                       596 *     120F     ACCESS TIMEOUT - INVALID CONTROL STATE
                       598 *     1301     SECTOR COMPARE CHECK
                       599 *     1310     FALSE DRIVE CHECK
                       601 *     1400     FALSE RD/WR CHECK
                       602 *     1401     WRITE CURRENT CHECK
                       603 *     1402     TRANSITION CHECK
                       604 *     1404     CONTROL CHECK
                       605 *     1408     RD/WRT INTERLOCK CHECK
                       606 *     1410     INDEX CHECK
                       607 *     1420     WRITE OVERRUN
                       608 *     1440     CAPABLE/ENABLE CHECK
                       609 *     1480     MULTIPLE HEAD SELECT CHECK
                       612 *     1500     INVALID OVERSHOOT CHECK
                       613 *     1501     INVALID OVERSHOOT CHECK
                       614 *     1502     INVALID OVERSHOOT CHECK
                       615 *     1503     OVERSHOOT CHECK - INVALID CONTROL STATE
                       616 *     1504     OVERSHOOT CHECK - INVALID CONTROL STATE
                       617 *     1505     OVERSHOOT CHECK - INVALID CONTROL STATE
                       618 *     1506     OVERSHOOT CHECK DURING RECAL-STATE 6
                       619 *     1507     OVERSHOOT CHECK - INVALID CONTROL STATE
                       620 *     1508     OVERSHOOT CHECK DURING SEEK-STATE 8-'DECELERATE'
                       621 *     1509     OVERSHOOT CHECK - INVALID CONTROL STATE
                       622 *     150A     OVERSHOOT CHECK DURING SEEK-STATE A-'ACCELERATE'
                       623 *     150B     OVERSHOOT CHECK - INVALID CONTROL STATE
                       624 *     150C     OVERSHOOT CHECK DURING SEEK-STATE C-'LINEAR MODE'
                       625 *     150D     OVERSHOOT CHECK - INVALID CONTROL STATE
                       626 *     150E     INVALID OVERSHOOT CHECK - STATE E - 'LOST SERVO'
                       627 *     150F     OVERSHOOT CHECK - INVALID CONTROL STATE
                       629 *     1600     SERVO OFF TRACK CHECK-SET R/W ON DURING ACCESS OPERATION
                       630 *     1601     SERVO OFF TRACK CHECK-SET R/W ON DURING ACCESS OPERATION
                       631 *     1602     SERVO OFF TRACK CHECK-SET R/W ON DURING ACCESS OPERATION
                       632 *     1603     SERVO OFF TRACK CHECK-INVALID
                       633 *     1604     SERVO OFF TRACK CHECK-INVALID
                       634 *     1605     SERVO OFF TRACK CHECK-INVALID
                       635 *     1606     SERVO OFF TRACK CHECK-SET R/W ON DURING ACCESS OPERATION
                       636 *     1607     SERVO OFF TRACK CHECK-INVALID
                       637 *     1608     SERVO OFF TRACK CHECK-SET R/W ON DURING ACCESS OPERATION
                       638 *     1609     SERVO OFF TRACK CHECK-INVALID
                       639 *     160A     SERVO OFF TRACK CHECK-SET R/W ON DURING ACCESS OPERATION
                       640 *     160B     SERVO OFF TRACK CHECK-INVALID
                       641 *     160C     SERVO OFF TRACK CHECK-SET R/W ON DURING ACCESS OPERATION
                       642 *     160D     SERVO OFF TRACK CHECK-INVALID
                       643 *     160E     SERVO OFF TRACK CHECK-SET R/W ON DURING ACCESS OPERATION
                       644 *     160F     SERVO OFF TRACK CHECK-INVALID
                       646 *     1910     INTERVENTION REQUIRED
                       647 *     1911     TRANSMIT TARGET ERROR
                       648 *     1912     MICROPGM DETECTED ERRORS
                       649 *     1914     SYNC OUT TIMING ERROR
                       650 *     1915     UNEXPECTED DRIVE STATUS AT
                       651 *              INITIAL SELECTION - INTERVENTION REQUIRED
                       652 *     1917     TRANSMIT HEAD ERROR
                       653 *     1918     TRANSMIT DIFFERENCE ERROR
                       654 *     1919     FILE STATUS NOT AS EXPECTED DURING READ IPL
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       655 *     191A     SEEK VERIFICATION CHECK ON PHYSICAL ADDRESS
                       656 *     1918     SEEK INCOMPLETE
                       657 *     191C     NO INTERRUPT FROM DRIVE
                       658 *     191D     DEFECT SKIPPING - ORIENTATION CHECK
                       660 *     9001     TAG VALID MISSING DURING RD/WRT OR ECC OP
                       661 *     9002     NORMAL END/CHK END MISSING DURING RD/WRT OR ECC OP
                       662 *     9003     NO RESPONSE FROM CONTROLLER ON CONTROL OP
                       663 *     9004     TIMEOUT WHILE WAITING FOR INDEX/ACTIVE TRACK
                       664 *     9005     ECC H/W CHECK
                       665 *     9006     CONTROLLER ADDRESS CHECK (3/6 FAILURE)
                       666 *     9007     PRE-SELECTION CHECK
                       667 *     9009     BUSY MISSING AFTER SEEK START
                       668 *
                       670 *     9104     I WRITE FAIL
                       671 *     9108     CONTROLLER BUS IN PARITY CHECK
                       672 *     9110     DEV BUS IN PARITY CHECK
                       673 *     9118     CONTROLLER BUS IN AND DEV BUS IN PARITY CHECK
                       674 *     9120     DRIVE SELECTION CHECK
                       675 *     9140     CTL INTERFACE BUS OUT PARITY CHECK
                       676 *     9180     CTL INTERFACE TAG BUS PARITY CHECK
                       678 *     9200     FALSE CONTROLLER ERROR
                       679 *     9202     ECC CHECK
                       680 *     9204     MONITOR CHECK
                       681 *     9206     ECC AND MONITOR CHECK
                       682 *     9208     WRITE DATA CHECK
                       683 *     920C     WRITE DATA AND MONITOR CHECK
                       684 *     9210     GAP COUNTER CHECK
                       685 *     9214     GAP COUNTER AND MONITOR CHECK
                       686 *     9220     SHIFT REGISTER CHECK
                       687 *     9222     SHIFT REGISTER CHECK AND ECC HARDWARE CHECK
                       688 *     9240     NO PLO INPUT
                       689 *     9280     PLO CHECK
                       691 *   FORMAT 4
                       693 *     4940     HA FIELD, ECC UNCORRECTABLE
                       694 *     4941     COUNT FIELD, ECC UNCORRECTABLE
                       695 *     4942     KEY FIELD, ECC UNCORRECTABLE
                       696 *     4943     DATA FIELD, ECC UNCORRECTABLE
                       697 *     4944     HA FIELD, NO SYNC BYTE FOUND
                       698 *     4945     COUNT FIELD, NO SYNC BYTE FOUND
                       699 *     4946     KEY FIELD, NO SYNC BYTE FOUND
                       700 *     4947     DATA FIELD, NO SYNC BYTE FOUND
                       702          END COPY-MEMBER HANDBOOK
                       703        COPY     EQUATES
                       704 *
                       705 *       EXTERNAL REGISTER ASSIGNMENT -- SENSE TYPE
                       706 *
0035                   707 FTI       DER   21          FILE TAG IN
002B                   708 HES       DER   11          HARDWARE ERROR SENSE
0029                   709 ADS       DER    9          ADAPTOR DIAGNOSTIC SENSE
0022                   710 FBI       DER    2          FILE BUS IN
0038                   711 CO2       DER   27          CHANNEL OUT REGISTER_2
                       712 *
                       713 *       EXTERNAL REGISTER ASSIGNMENT -- CONTROL TYPE
                       714 *
0033                   715 DXC       DER   19          DATA TRANSFER CONTROLS
0025                   716 FTG       DER    5          FILE TAG GATE
002D                   717 FTR       DER   13          FILE TRAP RESET
002F                   718 SCN       DER   15          SCAN OP CONTROLS
0027                   719 FHF       DER    7          FILE HARDWARE FLAGS
0023                   720 DST       DER    3          DEVICE STATUS
002E                   721 FBO       DER   14          FILE BUS OUT
0026                   722 FTO       DER    6          FILE TAG OUT
0036                   723 FCT       DER   22          FILE BYTE COUNTER
0021                   724 CCH       DER    1          CHANNEL BUFFER COUNTER HI
0031                   725 CCL       DER   17          CHANNEL BUFFER COUNTER LOW
003F                   726 SB0       DER   31          SENSE BYTE 0
0037                   727 SB1       DER   23          SENSE BYTE 1
003D                   728 BDO       DER   29          CHANNEL IN REG_0
0024                   729 FI1       DER   10          FILE IN REG_1
                       730 *
```

```
LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       731 *      LOCAL REGISTER ASSIGNMENT
                       732 *
0000                   733 L0       DLR    0<0>      WORK REGISTER
0001                   734 L1       DLR    1<0>      WORK REGISTER
0002                   735 L2       DLR    2<0>      WORK REGISTER
0003                   736 L3       DLR    3<0>      WORK REGISTER
0004                   737 L4       DLR    4<0>      WORK REGISTER
0005                   738 L5       DLR    5<0>      WORK REGISTER
0006                   739 L6       DLR    6<0>      WORK REGISTER
0007                   740 L7       DLR    7<0>      WORK REGISTER
0008                   741 L8       DLR    8<0>      WORK REGISTER
0009                   742 GEN1     DLR    9<0>      GENERAL MARKS REG_1
000A                   743 UNCK     DLR   10<0>      UNIT CHECK MARKS
000B                   744 STAT     DLR   11<0>      STATUS BYTE
000C                   745 QBYT     DLR   12<0>      Q-BYTE
000D                   746 RBYT     DLR   13<0>      R-BYTE
000E                   747 PAC      DLR   14<0>      PHYSICAL ADDR HIGH
000F                   748 PAH      DLR   15<0>      PHYSICAL ADDR LOW
                       749 *
                       750 *
0010                   751 ZER      DLR    0<1>      WORK REGISTER CONTAINS ZERO
0011                   752 CEB1     DLR    1<1>      COMMAND XEQ BYTE 1
0012                   753 CEB2     DLR    2<1>      COMMAND XEQ BYTE 2
0013                   754 MSC1     DLR    3<1>      MISC UPGM MARKS REG_1
0014                   755 MSC2     DLR    4<1>      MISC UPGM MARKS REG_2
0015                   756 FLAG     DLR    5<1>      FLAG BYTE--FROM DDCF
0016                   757 CHI      DLR    6<1>      CYLINDER HIGH--FROM DDCF (3340)
0017                   758 CLO      DLR    7<1>      CYLINDER LOW--FROM DDCF (3340)
0018                   759 HEAD     DLR    8<1>      HEAD LOW--FROM DDCF (3340)
0019                   760 REC      DLR    9<1>      RECORD NUMBER--FROM DDCF
001A                   761 KCNT     DLR   10<1>      KEY LENGTH--FROM DDCF
001B                   762 DCNT     DLR   11<1>      DATA LENGTH LOW--FROM DDCF
001C                   763 NREC     DLR   12<1>      NUMBER OF RECORD--FROM DDCF
001D                   764 SDH      DLR   13<1>      SKIP DISPLACEMENT HIGH
001E                   765 SDL      DLR   14<1>      SKIP DISPLACEMENT LOW
001F                   766 FFLG     DLR   15<1>      FLAG BYTE--FROM FILE
                       767 *
0010                   768 W0       DLR    0<1>      WORK REGISTER 0
0011                   769 W1       DLR    1<1>      WORK REGISTER 1
0012                   770 W2       DLR    2<1>      WORK REGISTER 2
0013                   771 W3       DLR    3<1>      WORK REGISTER 3
0014                   772 W4       DLR    4<1>      WORK REGISTER 4
0015                   773 W5       DLR    5<1>      WORK REGISTER 5
0016                   774 W6       DLR    6<1>      WORK REGISTER 6
0017                   775 W7       DLR    7<1>      WORK REGISTER 7
0018                   776 W8       DLR    8<1>      WORK REGISTER 8
0019                   777 W9       DLR    9<1>      WORK REGISTER 9
001A                   778 W10      DLR   10<1>      WORK REGISTER 10
001B                   779 W11      DLR   11<1>      WORK REGISTER 11
001C                   780 W12      DLR   12<1>      WORK REGISTER 12
001D                   781 W13      DLR   13<1>      WORK REGISTER 13
001E                   782 W14      DLR   14<1>      WORK REGISTER 14
001F                   783 W15      DLR   15<1>      WORK REGISTER 15
                       784 *
                       785 *       EXTERNAL REGISTER        FTO
                       786 *
0001                   787 SETUNSUP EQU   X'01'      SET UNSUPPRESSIBLE REG
0082                   788 POLLDEV  EQU   X'82'      POLL DEVICE
0002                   789 POLLCNTL EQU   X'02'      POLL CONTROLLER
0083                   790 SELDEV   EQU   X'83'      SELECT DEVICE
0003                   791 SELCNTL  EQU   X'03'      SELECT CONTROLLER
0084                   792 RDSTATUS EQU   X'84'      READ STATUS
0085                   793 SETRDWR  EQU   X'85'      SET READ/WRITE
0004                   794 RDERROR  EQU   X'04'      READ ERROR BYTES
0005                   795 RSTRDWR  EQU   X'05'      RESET READ/WRITE
0008                   796 ECCCNTL  EQU   X'08'      ECC CONTROL
0009                   797 XMITCNTL EQU   X'09'      TRANSMIT CONTROL
000A                   798 RDCNTL   EQU   X'0A'      READ CONTROL
000C                   799 DISPCEHI EQU   X'0C'      DISPLAY CE LAMPS HIGH
000D                   800 DISPCELO EQU   X'0D'      DISPLAY CE LAMPS LOW
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

000E                   801 READOP   EQU   X'0E'      READ OP
000F                   802 WRITEOP  EQU   X'0F'      WRITE OP
0089                   803 SNSINFC  EQU   X'89'      SENSE INTERFACE
008A                   804 DIAGSET  EQU   X'8A'      DIAGNOSTIC SET
008B                   805 SETHAR   EQU   X'8B'      SET HAR REG
008C                   806 SETDIFF  EQU   X'8C'      SET DIFFERENCE REG
008F                   807 CONTROL  EQU   X'8F'      CONTROL TAGS
                       808 *
                       809 *       EXTERNAL REGISTER        FBO--UNDER RD ERROR BYTES TAG
                       810 *
0080                   811 ECCLOW   EQU   X'80'      READ ECC LOW
0040                   812 ECCHI    EQU   X'40'      READ ECC HIGH
0010                   813 PHYADDR  EQU   X'10'      READ PHYSICAL ADDRESS
0002                   814 CTLRERR1 EQU   X'02'      READ CONTROLLER ERROR BYTE 1
0001                   815 CTLRERR2 EQU   X'01'      READ CONTROLLER ERROR BYTE 2
                       816 *
                       817 *       EXTERNAL REGISTER        FBO--UNDER READ OP TAG
                       818 *
0010                   819 CLKG3    EQU   X'10'      CLOCK G3
0020                   820 CLKG2    EQU   X'20'      CLOCK G2
0030                   821 RDG4     EQU   X'30'      READ G4
0040                   822 RDG1     EQU   X'40'      READ G1
0050                   823 RDG3     EQU   X'50'      READ G3
0060                   824 RDG2     EQU   X'60'      READ G2
0070                   825 RDG3AM   EQU   X'70'      READ G3 AM SEARCH
00E0                   826 SPRDG2   EQU   X'E0'      SPECIAL READ G2
                       827 *
                       828 *       EXTERNAL REGISTER        FBO--UNDER WRITE OP TAG
                       829 *
0020                   830 WRG2     EQU   X'20'      WRITE G2
0040                   831 FMTG1    EQU   X'40'      FORMAT G1
0050                   832 FMTG3    EQU   X'50'      FORMAT G3
0060                   833 FMTG2    EQU   X'60'      FORMAT G2
0070                   834 FMTERASE EQU   X'70'      FORMAT ERASE
0080                   835 WRG4     EQU   X'80'      WRITE G4
00C0                   836 SPFMTG1  EQU   X'C0'      SPECIAL FORMAT G1
00E0                   837 SPFMTG2  EQU   X'E0'      SPECIAL FORMAT G2
                       838 *
                       839 *       EXTERNAL REGISTER        FBO--UNDER SET HAR TAG
                       840 *
0080                   841 FORWARD  EQU   X'80'      DIRECTION BIT FOR SEEK
0040                   842 DIFF256  EQU   X'40'      DIFFERENCE COUNT 256 BIT
                       843 *
                       844 *       EXTERNAL REGISTER        FBO--UNDER CONTROL TAG (X'8F')
                       845 *
0008                   846 SKSTART  EQU   X'08'      SEEK START
0004                   847 RSTATTN  EQU   X'04'      RESET ATTENTION
000C                   848 CHKRST   EQU   X'0C'      CHECK RESET
0002                   849 REZERO   EQU   X'02'      REZERO
0009                   850 SNSDIFF  EQU   X'09'      SENSE DIFF REG
0005                   851 SNSHAR   EQU   X'05'      SENSE HAR
0003                   852 SENSTAT0 EQU   X'03'      SENSE STATUS BYTE 0
0083                   853 SENSTAT1 EQU   X'83'      SENSE STATUS BYTE 1
0043                   854 SENSTAT2 EQU   X'43'      SENSE STATUS BYTE 2
0023                   855 SENSTAT3 EQU   X'23'      SENSE STATUS BYTE 3
0013                   856 SENSTAT4 EQU   X'13'      SENSE STATUS BYTE 4
0008                   857 SNSRDWR  EQU   X'08'      SENSE RD/WR
0007                   858 RWCTRL   EQU   X'07'      READ/WRITE CONTROL
0040                   859 WRGATE   EQU   X'40'      WRITE GATE
0020                   860 UNSQELCH EQU   X'20'
0010                   861 RDGATE   EQU   X'10'
0080                   862 AMSRCH   EQU   X'80'      AM SEARCH
                       863 *
                       864 *       EXTERNAL REGISTER        FTI
                       865 *
0080                   866 SELACT   EQU   X'80'      SELECT ACTIVE
0040                   867 TAGVALID EQU   X'40'      TAG VALID
0020                   868 CHKEND   EQU   X'20'      CHECK END
0010                   869 CEALERT  EQU   X'10'      CE ALERT
0008                   870 NORMEND  EQU   X'08'      NORMAL END
```

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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0004                   871 SYNCIN    EQU   X'04'       SYNC IN
0002                   872 INDEX     EQU   X'02'       INDEX
0001                   873 ERRALERT  EQU   X'01'       ERROR ALERT
                       874 *
                       875 *       EXTERNAL REGISTER         FBI -- DUMMY REGISTER FOR GATING FIO
                       876 *
0000                   877 DUMMY     EQU   L0
                       878 *
                       879 *       EXTERNAL REGISTER         FBI -- UNDER RD STATUS TAG
                       880 *
0080                   881 CTLRCHK   EQU   X'80'       CONTROLLER CHECK
0040                   882 INFCHK    EQU   X'40'       INTERFACE CHECK
0020                   883 DRVCHK    EQU   X'20'       DRIVE CHECK
0010                   884 RWCHK     EQU   X'10'       READ/WRITE CHECK
0008                   885 ONLINE    EQU   X'08'       ON LINE
0004                   886 ATTN      EQU   X'04'       ATTENTION
0002                   887 BUSY      EQU   X'02'       BUSY
0001                   888 SKDONE    EQU   X'01'       SEEK COMPLETE
                       889 *
                       890 *       EXTERNAL REGISTER         FBI -- UNDER RD/WR TAG
                       891 *
0002                   892 IDXMK     EQU   X'02'       INDEX MARK
0001                   893 ACTRK     EQU   X'01'       ACTIVE TRACK
                       894 *
                       895 *       EXTERNAL REGISTER         FBI -- UNDER RD/WR ON TAG VALID
                       896 *
0020                   897 LOSTORT   EQU   X'20'       LOST ORIENTATION
0008                   898 STATOVN   EQU   X'08'       STATUS OVERRUN
0002                   899 RG1UNORT  EQU   X'02'       READ G1 UNORIENTED
0001                   900 ACTRACK   EQU   X'01'       ACTIVE TRACK
                       901 *
                       902 *       EXTERNAL REGISTER         FBI -- UNDER RD/WR ON CHECK END
                       903 *
0080                   904 CMDOVN    EQU   X'80'       READ/WRITE -- COMMAND OVERRUN
0040                   905 DATAOVN   EQU   X'40'       READ/WRITE -- DATA OVERRUN
0010                   906 DATACHK   EQU   X'10'       READ ONLY  -- DATA CHECK
0008                   907 NOAM      EQU   X'08'            ''    -- NO AM FOUND
0004                   908 NOSYNC    EQU   X'04'            ''    -- NO SYNC BYTE FOUND
0002                   909 DATAFND   EQU   X'02'            ''    -- DATA FOUND
0010                   910 TRKOVN    EQU   X'10'       WRITE ONLY -- TRACK OVERRUN
                       911 *
                       912 *       EXTERNAL REGISTER         FTG
                       913 *
0080                   914 TAGATE    EQU   X'80'       TAG GATE
0040                   915 SELHOLD   EQU   X'40'       SELECT HOLD
0020                   916 FORCERYC  EQU   X'20'       FORCE RECYCLE
0008                   917 RESPONSE  EQU   X'08'       RESPONSE GATE
0004                   918 FOTOFI    EQU   X'04'       DIAGNOSTIC GATE FO REG TO FI REG
0002                   919 DSYNCIN   EQU   X'02'       DIAGNOSTIC SYNC IN
0001                   920 ALLOWFBI  EQU   X'01'       ALLOW FBI PARITY CHECK
                       921 *
                       922 *       EXTERNAL REGISTER         DST
                       923 *
0080                   924 IOPBUSY   EQU   X'80'       ATTACHMENT BUSY
0040                   925 CHOUTVAL  EQU   X'40'       CHANNEL OUT REG VALID
0040                   926 DIFFZERO  EQU   X'40'       DIFFERENCE COUNTER EQUAL ZERO
0020                   927 ENDCHXFR  EQU   X'20'       END OF CHANNEL DATA XFER
0010                   928 ALWCHXFR  EQU   X'10'       ALLOW CHANNEL DATA XFER
                       929 *
                       930 *       EXTERNAL REGISTER         SCN
                       931 *
0080                   932 SCANRD    EQU   X'80'       SCAN READ OR CMD
0040                   933 SCANHI    EQU   X'40'       SCAN HIGH OR EQUAL
0020                   934 SCNSPLIT  EQU   X'20'       SCAN SPLIT FIELD
0010                   935 LASTREC   EQU   X'10'       LAST RECORD
0008                   936 ALWFXFR   EQU   X'08'       ALLOW FILE XFER
0004                   937 FILEODD   EQU   X'04'       FILE ODD XFER
0002                   938 TOFILE    EQU   X'02'       DATA TO FILE
0001                   939 NFILEXFR  EQU   X'01'       INHIBIT FILE TO CS XFER
                       940 *
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       941 *       EXTERNAL REGISTER         FTR
                       942 *
0080                   943 ADTCKRST  EQU   X'80'       ADAPTER CHECK RESET
0040                   944 IOATTN    EQU   X'40'       I/O ATTENTION LIGHT
0020                   945 DMATTN    EQU   X'20'       DATA MODULE ATTENTION--CAUSES AN INTERRUPT
0010                   946 IOCONB    EQU   X'10'       I/O CONDITION B
0008                   947 ERRTRAP   EQU   X'08'       DISABLE ERROR TRAP
0002                   948 INVPRTY   EQU   X'02'       INVERT PARITY
0001                   949 ALLOWIDX  EQU   X'01'       INDEX ENABLE/RESET
                       950 *
                       951 *       EXTERNAL REGISTER         FHF
                       952 *
0080                   953 SPRESET   EQU   X'80'       SYSTEM/PWR ON RESET
0040                   954 CHKRESET  EQU   X'40'       CHECK RESET CHANNEL
0020                   955 ERRMODE   EQU   X'20'       FORCE ERROR MODE
0008                   956 ENDTRAP   EQU   X'08'       END OF TRAP COUNT
0004                   957 SCNSAT    EQU   X'04'       SCAN SATISFIED
0002                   958 SCNEQ     EQU   X'02'       SCAN EQUAL
0001                   959 ENDFILEX  EQU   X'01'       END OF FILE DATA XFER
                       960 *
                       961 *       EXTERNAL REGISTER         CO2
                       962 *
0001                   963 DDODD     EQU   X'01'       ODD ADDRESS BIT
                       964 *
                       965 *       EXTERNAL REGISTER         DXC
                       966 *
0080                   967 DATACHAN  EQU   X'80'       DATA TO/FROM CHANNEL
0040                   968 CHANODD   EQU   X'40'       CHANNEL ODD XFER
0020                   969 LSRCSR    EQU   X'20'       LSR CYCLE STEAL REQUEST
0010                   970 LSRSELDR  EQU   X'10'       LSR SELECT DDDR
0008                   971 ALOWCHAN  EQU   X'08'       ALLOW DIFF COUNTER CHANNEL
0004                   972 ALOWFILE  EQU   X'04'       ALLOW DIFF COUNTER FILE
0002                   973 SUBTRACT  EQU   X'02'       SUBTRACT
0001                   974 CHNL1BYT  EQU   X'01'       CHANNEL ONE BYTE XFER
                       975 *
                       976 *       EXTERNAL REGISTER         HES
                       977 *
0080                   978 CSOVRUN   EQU   X'80'       CYCLE STEAL OVERRUN
0040                   979 CICHECK   EQU   X'40'       CIO/CI1 PARITY CHECK
0010                   980 CHANXCHK  EQU   X'10'       CHANNEL TRANSFER CHECK
0008                   981 ADAPTCHK  EQU   X'08'       ADAPTER CHECK
0001                   982 RCSCHK    EQU   X'01'       RCS PARITY CHECK
                       983 *
                       984 *       EXTERNAL REGISTER         ADS
                       985 *
0080                   986 SYNCOUT   EQU   X'80'       SYNC OUT
0040                   987 RECYCLE   EQU   X'40'       RECYCLE
0020                   988 TIMEOUT   EQU   X'20'       TIMER OVERFLOWS
0010                   989 FILEXCHK  EQU   X'10'       FILE TRANSFER CHECK
0008                   990 FBOCHK    EQU   X'08'       FBO PARITY CHECK
0004                   991 FTOCHK    EQU   X'04'       FTO PARITY CHECK
0002                   992 FBICHK    EQU   X'02'       FBI PARITY CHECK
0001                   993 EXTARCHK  EQU   X'01'       EXTERNAL ADDRESS CHECK
                       994 *
                       995 *       LOCAL REGISTER            GEN1
                       996 *
0080                   997 STACKCMD  EQU   X'80'       STACK CMD PENDING
0040                   998 FINCHXFR  EQU   X'40'       FINISH CHAN XFER
0020                   999 FIXDDCF   EQU   X'20'       RESTORE DDCF
0010                  1000 XFRHACNT  EQU   X'10'       TRANSFER HA AND COUNT
0008                  1001 XFRDDDF   EQU   X'08'       TRANSFER DDDF
0004                  1002 SETRWON   EQU   X'04'       SET RD/WR TAG ON
0002                  1003 UPDTRDUS  EQU   X'02'       UPDATE READ USAGE COUNTER
0001                  1004 ODDXFER   EQU   X'01'       FILE ODD XFER SWITCH
                      1005 *
                      1006 *       LOCAL REGISTER            UNCK
                      1007 *
0080                  1008 INTREQD1  EQU   X'80'       INTERVENTION REQD -- DRIVE 1
0040                  1009 INTREQD2  EQU   X'40'       INTERVENTION REQD -- DRIVE 2
0020                  1010 INTREQD3  EQU   X'20'       INTERVENTION REQD -- DRIVE 3
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0010                  1011 INTREQD4 EQU   X'10'      INTERVENTION REQD -- DRIVE 4
0008                  1012 CTROFLD1 EQU   X'08'      USAGE COUNTER OVERFLOW -- DRIVE 1
0004                  1013 CTROFLD2 EQU   X'04'      USAGE COUNTER OVERFLOW -- DRIVE 2
0002                  1014 CTROFLD3 EQU   X'02'      USAGE COUNTER OVERFLOW -- DRIVE 3
0001                  1015 CTROFLD4 EQU   X'01'      USAGE COUNTER OVERFLOW -- DRIVE 4
                      1016 *
                      1017 *      LOCAL REGISTER          STAT
                      1018 *
0080                  1019 ERRRETUN EQU   X'80'      ERROR RETURN
0040                  1020 SCANEQUL EQU   X'40'      SCAN EQUAL
0010                  1021 OPEND    EQU   X'10'      OP END
0008                  1022 NOOP     EQU   X'08'      NO OP
0002                  1023 UNITCHK  EQU   X'02'      UNIT CHECK
0001                  1024 SKCMPL   EQU   X'01'      SEEK COMPLETE
                      1025 *
                      1026 *      LOCAL REGISTER          CEB1
                      1027 *
0080                  1028 ROCTODF  EQU   X'80'      RD RO COUNT FIELD TO DDDF
0040                  1029 FMTWR    EQU   X'40'      FORMAT WRITE COMMAND
0020                  1030 WRENABLE EQU   X'20'      WRITE ENABLED
0010                  1031 PADTOIDX EQU   X'10'      PADDING
0008                  1032 PROCRO   EQU   X'08'      PROCESS RO COUNT FIELD
0004                  1033 PROCNT   EQU   X'04'      PROCESS COUNT FIELD
0002                  1034 PROCKEY  EQU   X'02'      PROCESS KEY FIELD
0001                  1035 PROCDAT  EQU   X'01'      PROCESS DATA FIELD
                      1036 *
                      1037 *      LOCAL REGISTER          CEB2
                      1038 *
0080                  1039 READ     EQU   X'80'      READ COMMAND
0040                  1040 SRCH     EQU   X'40'      SEARCHING
0020                  1041 WRITE    EQU   X'20'      WRITE COMMAND
0008                  1042 WHAOK    EQU   X'08'      SD BYTES IN CONTROL STORE VALID
0000                  1043 ENDHA    EQU   X'00'      END OF HA
0001                  1044 ENDROCNT EQU   X'01'      END OF RO COUNT
0002                  1045 ENDKEY   EQU   X'02'      END OF KEY
0003                  1046 ENDDAT   EQU   X'03'      END OF DATA
0004                  1047 ENDCNT   EQU   X'04'      END OF COUNT
0006                  1048 ENDKEY1  EQU   X'06'      END OF FIRST SEGMENT KEY
0007                  1049 ENDDAT1  EQU   X'07'      END OF FIRST SEGMENT DATA
                      1050 *
                      1051 *      LOCAL REGISTER          MSC1
                      1052 *
0080                  1053 RDSNS    EQU   X'80'      READ DIAG SENSE CMD
0040                  1054 MUTRK    EQU   X'40'      MULTIPLE TRACK OP
0020                  1055 MUREC    EQU   X'20'      MULTIPLE RECORD OP
0008                  1056 IDXP2    EQU   X'08'      INDEX PASSED TWICE
0004                  1057 IDXP1    EQU   X'04'      INDEX PASSED ONCE
0002                  1058 ERASE    EQU   X'02'      ERASE TO INDEX
0001                  1059 TRKOFL   EQU   X'01'      TRACK OVERFLOW
                      1060 *
                      1061 *      LOCAL REGISTER          MSC2
                      1062 *
0080                  1063 SCANSW   EQU   X'80'      BYTE TRANSFER COUNT MARK FOR SCAN OP
0040                  1064 DDCRODD  EQU   X'40'      DDCR ON ODD ADDR BOUNDARY
0020                  1065 DDDRODD  EQU   X'20'      DDDR ON ODD ADDR BOUNDARY
0008                  1066 DL0      EQU   X'08'      DATA LENGTH EQUAL ZERO
0004                  1067 SIZE12   EQU   X'04'      12MB DATA MODULE
0002                  1068 KDGT256  EQU   X'02'      KL+DL GREATER THAN 256 / BYTEREAD OVERFLOW
0001                  1069 DL256    EQU   X'01'      DATA LENGTH 256 BIT
                      1070 *
                      1071 *      LOCAL REGISTER          FLAG/FFLG
                      1072 *
0080                  1073 DEFCNT   EQU   X'80'      DEFECT IN COUNT FIELD
0040                  1074 DEFKEY   EQU   X'40'      DEFECT IN KEY FIELD
0020                  1075 DEFDAT   EQU   X'20'      DEFECT IN DATA FIELD
0004                  1076 CMPDAT   EQU   X'04'      COMPRESSED DATA FMT  (S/3 ONLY)        -<CD>-
0002                  1077 DEFTRK   EQU   X'02'      DEFECTIVE TRACK
0001                  1078 ALTTRK   EQU   X'01'      ALTERNATE TRACK
                      1079 *
                      1080 *      MISCELLANEOUS
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                      1081 *
00FF                  1082 FF       EQU   X'FF'
0080                  1083 ALOW12   EQU   X'80'      ALLOW OPERATION ON 12MB DATA MODULE
0040                  1084 ALOWSKCE EQU   X'40'      ALLOW SEEK TO CE TRACKS
0020                  1085 FORCERST EQU   X'20'      FORCE SYSTEM RESET
0008                  1086 ALWRTHA  EQU   X'08'      ALLOW WRITE HA SVP OPTION
0002                  1087 SVPREQ   EQU   X'02'      SVP REQUEST LATCH
                      1088 *
                      1089 *      A L S   &   Z L S    ASSIGNMENT
                      1090 *
0001                  1091 INDEXB   DABR    1        INDEX FOR BASE
0003                  1092 INDEXCH  DABR    3        INDEX FOR CHANNEL TRAP
0005                  1093 INDEXF1  DABR    5        INDEX FOR FILE TRAP 1ST
0007                  1094 INDEXF2  DABR    7        INDEX FOR FILE TRAP 2ND
0009                  1095 INDEXE1  DABR    9        INDEX FOR EXTERNAL TRAP 1ST
000B                  1096 INDEXE2  DABR   11        INDEX FOR EXTERNAL TRAP 2ND
000D                  1097 INDEXE3  DABR   13        INDEX FOR EXTERNAL TRAP 3RD
000F                  1098 INDEXE4  DABR   15        INDEX FOR EXTERNAL TRAP 4TH
001F                  1099 INDEXIT  DADR   31        INDEX FOR MASKING TRAPS
                      1100 *
0018                  1101 MIARBB   DABR   24        MIAR BLOCK FOR BASE LEVEL
0018                  1102 MIARBD   DADR   24        MIAR DISPL FOR BASE LEVEL
0014                  1103 MIAREB   DABR   20        MIAR BLOCK FOR EXTERNAL LEVEL
0014                  1104 MIARED   DADR   20        MIAR DISPL FOR EXTERNAL LEVEL
                      1105 *
001E                  1106 BLOCKCH  DABR   30        BLOCK ADDR FOR CHANNEL TRAP
001E                  1107 DISPCH   DADR   30        DISPL ADDR FOR CHANNEL TRAP
0006                  1108 BLOCKFC  DABR    6        BLOCK ADDR FOR FILE (DDCF) TRAP
0006                  1109 DISPFC   DADR    6        DISPL ADDR FOR FILE (DDCF) TRAP
000A                  1110 BLOCKFD  DABR   10        BLOCK ADDR FOR FILE (DDDF) TRAP
000A                  1111 DISPFD   DADR   10        DISPL ADDR FOR FILE (DDDF) TRAP
001A                  1112 BLOCKB   DABR   26        BLOCK ADDR FOR BASE
0016                  1113 BLOCKE   DABR   22        BLOCK ADDR FOR EXTERNAL TRAP
                      1114 *
0006                  1115 ZLSLOCB  DZR     6        LOCAL ZONE FOR BASE
0005                  1116 ZLSLOCE  DZR     5        LOCAL ZONE FOR EXTERNAL TRAP
0007                  1117 ZLSLOC7  DZR     7        ZLS LOCATION 7
000E                  1118 ZLSEXTB  DZR    14        EXTERNAL ZONE FOR BASE
000D                  1119 ZLSEXTE  DZR    13        EXTERNAL ZONE FOR EXTERNAL TRAP
0009                  1120 ZLSEXTFC DZR     9        EXTERNAL ZONE FOR FILE DDCF TRAP
000A                  1121 ZLSEXTFD DZR    10        EXTERNAL ZONE FOR FILE DDDF TRAP
000F                  1122 ZLSEXTC  DZR    15        EXTERNAL ZONE FOR CHANNEL TRAP
0017                  1123 ZLSCH    DZR    23        ZONE FOR CHANNEL TRAP
0011                  1124 ZLSFC    DZR    17        ZONE FOR FILE (DDCF) TRAP
0012                  1125 ZLSFD    DZR    18        ZONE FOR FILE (DDDF) TRAP
                      1126 *
                      1127 *      EQUATES FOR LOADING ZLS
                      1128 *
004A                  1129 ZLSRFILE EQU   X'4A'      READ DATA FROM FILE
00CE                  1130 ZLSWFILE EQU   X'CE'      WRITE DATA TO FILE
005B                  1131 ZLSFCHAN EQU   X'5B'      FETCH DATA FROM CHANNEL
00DD                  1132 ZLSSCHAN EQU   X'DD'      STORE DATA TO CHANNEL
                      1133 *
0020                  1134 IDXDDCF  EQU   X'20'      DDCF INDEX
0040                  1135 IDXDDDF  EQU   X'40'      DDDF INDEX
                      1137         END COPY-MEMBER EQUATES
0000                  1138     ORG      X'0000'
                      1139     COPY     TRS12
                      1140 *
                      1141 ************************************************************
                      1142 *
                      1143 *          RESET ROUTINES
                      1144 *   THE FOLLOWING ROUTINES ARE ENTERED AS A RESULT OF:
                      1145 *       1. SYSTEM RESET (TRSYSRST)
                      1146 *       2. IMPL (TRSTART)
                      1147 *
                      1148 *   L2 ALL BITS OFF IS SYSTEM RESET
                      1149 *   L2 ALL BITS ON IS IMPL
                      1150 *
                      1151 *   ROUTINE SHOULD BE ENTERED IN THE EXTERNAL TRAP LEVEL.
```

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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       1152 *   IMPL WILL FORCE THIS LEVEL THROUGH THE SVP INTERFACE.
                       1153 *
                       1154 ************************************************************
                       1155 *                                                          *
0000 200082   100082   1156 TRSTART  BU    TRSLSRST                                   *
0001 20002D   10002D   1157          B     TRSTART2                                   *
                       1158 *                                                          *
                       1159 *   RESET ZLS,ALS,MODE,SVP LINK                            *
                       1160 *                                                          *
0002 28C608   138608   1161 TRSLSRST SZI   ZLSLOC6,X'08'      *BASE LOCAL ZONE
0003 28C508   138508   1162          SZI   ZLSLOCE,X'08'      *EXTERNAL LOCAL ZONE
0004 08C708   038708   1163          SZI   ZLSLOC7,X'08'      *INIT LOCATION 7 TO AVOID ZLS CHECKS
0005 28CE00   138E00   1164          SZI   ZLSEXTB,X'00'      *BASE EXTERNAL ZONE
0006 28CD00   138D00   1165          SZI   ZLSEXTE,X'00'      *EXTERNAL EXTERNAL ZONE
0007 08C900   038900   1166          SZI   ZLSEXTFC,X'00'     *EXTERNAL ZONE FOR FILE DDCF TRAP
0008 08CA00   038A00   1167          SZI   ZLSEXTFD,X'00'     *EXTERNAL ZONE FOR FILE DDDF TRAP
0009 08CF00   038F00   1168          SZI   ZLSEXTC,X'00'      *EXTERNAL ZONE FOR CHAN TRAP
000A 28D14A   13914A   1169          SZI   ZLSFC,ZLSRFILE     *INIT ZLS FOR FILE TRAPS
000B 28D24A   13924A   1170          SZI   ZLSFD,ZLSRFILE     *   TO READ FROM FILE
000C 2A0000   188000   1171          LBI   L0,0               *SET DUMMY REGISTER
000D 299E80   169E80   1172          SMODE L0,30              *CHANNEL MODE
000E 298680   168680   1173          SMODE L0,6               *FILE 1 MODE
000F 298A80   168A80   1174          SMODE L0,10              *FILE 2 MODE
0010 299880   169880   1175          SMODE L0,24              *BASE MODE
0011 08E400   03A400   1176          SLKI  4,X'00'            *RESET SVP LINK REGISTER
0012 0881C0   0281C0   1177          SABI  INDEXB,X'C0'       *BASE INDEX
0013 0883E0   0283E0   1178          SABI  INDEXCH,X'E0'      *CHANNEL INDEX
0014 088520   028520   1179          SABI  INDEXF1,X'20'      *FILE 1 INDEX
0015 288720   128720   1180          SABI  INDEXF2,X'20'      *FILE 2 INDEX
0016 0889BF   0289BF   1181          SABI  INDEXE1,X'BF'      *EXT 1 INDEX
0017 2888BF   1288BF   1182          SABI  INDEXE2,X'BF'      *EXT 2   ''
0018 288DBF   128DBF   1183          SABI  INDEXE3,X'BF'      *EXT 3   ''
0019 088FBF   028FBF   1184          SABI  INDEXE4,X'BF'      *EXT 4   ''
                       1185 *                                                          *
001A 289800   129800   1186          SABI  MIARBB,B(TRSEXIT)  *LOAD BASE
001B 288873   128873   1187          SADI  MIARBD,D(TRSEXIT)  * MIAR
001C 089A05   029A05   1188          SABI  BLOCKB,B(DDCFORG)  *INIT BLOCK ADDR FOR BASE
001D 089E85   029E85   1189          SABI  BLOCKCH,B(DDCFORG+X'8000')  INIT BLOCK ADDR FOR CH TRAP
001E 088685   028685   1190          SABI  BLOCKFC,B(DDCFORG+X'8000')  INIT BLOCK ADDR FOR FC TRAP
001F 08A600   02A600   1191          SADI  DISPFC,D(DDCFORGL) *INIT DISPL ADDR FOR FILE DDCF TRAP
0020 088A86   028A86   1192          SABI  BLOCKFD,B(DDDFORG+X'8000')  INIT BLOCK ADDR FOR FD TRAP
0021 08AA00   02AA00   1193          SADI  DISPFD,D(DDDFORG)  *INIT DISPL ADDR FOR FILE DDDF TRAP
0022 089605   029605   1194          SABI  BLOCKE,B(DDCFORG)  *INIT BLOCK ADDR FOR EXTERNAL TRAP
                       1195 *                                                          *
                       1196 *   RESET LOCAL REGISTERS                                  *
                       1197 *                                                          *
                       1198 *                                                          *
0023 0A2600   08A600   1199          LBI   FTO,0              *INIT FTO REG FOR ZLS LOADING
0024 09C526   078526   1200 TRSREG   SZR   FTO,ZLSLOCE        *SET ZLSLOCE FROM FTO
0025 2A0000   188000   1201          LBI   L0,0               *
0026 0A0100   088100   1202          LBI   L1,0               *
0027 0A0200   088200   1203          LBI   L2,0               *
0028 2A0300   188300   1204          LBI   L3,0               *
0029 0EE610   0BE610   1205          ADDI  FTO,X'10'          *SHIFT ZONE BIT
002A 228024   1A0024   1206          BNC   TRSREG             *BRANCH IF NOT ALL REGS RESET
002B 28C508   138508   1207          SZI   ZLSLOCE,X'08'      *RESTORE ZLSLOCE
002C 0F90D0   0ED0D0   1208          EORU  ZER,ZER            *RETURN TO CALLING ROUTINE
                       1209 *                                                          *
                       1210 *   IMPL MARK                                              *
                       1211 *                                                          *
002D 0A02FF   0882FF   1212 TRSTART2 LBI   L2,X'FF'            *L2 ALL ON IS IMPL
002E 200030   100030   1213          B     TRSRST3            *
                       1214 *                                                          *
                       1215 *   INITIALIZE FOR SYSTEM RESET                            *
                       1216 *                                                          *
002F 0A0200   088200   1217 TRSYSRST LBI   L2,0               *L2 ALL OFF IS SYSTEM RESET
                       1218 *                                                          *
                       1219 *   RESET EXTERNAL REGISTERS                               *
                       1220 *                                                          *
0030 0E23E0   08E3E0   1221 TRSRST3  ANDI  DST,X'E0'          *RESET ATTACHMENT BUSY,DIFF CNTR=0
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       1222 *                                                          *END OF CHANNEL TRANSFER, ALLOW
                       1223 *                                                          *CHANNEL TRANSFER BITS IN DST
0031 2A2D00   18AD00   1224          LBI   FTR,0              *RESET FTR
0032 0E27FF   08E7FF   1225          ANDI  FHF,FF             *RESET ALL FHF BITS
0033 0A2F00   08AF00   1226          LBI   SCN,0              *RESET SCN
0034 2A3300   18B300   1227          LBI   DXC,0              *RESET DXC
0035 0E3F0F   08FF0F   1228          ANDI  SBO,X'0F'          *RESET ANY SBO BITS ON
0036 0A3700   08B700   1229          LBI   SB1,0              *RESET SB1
                       1230 *                                                          *
                       1231 *   RESET DRIVES AND CONTROLLER                            *
                       1232 *                                                          *
0037 0A2500   08A500   1233          LBI   FTG,0              *DROP TAG GATE,SELECT HOLD,ETC.
0038 0A2D80   08AD80   1234          LBI   FTR,X'80'          *ADAPTER CHECK RESET
0039 2E2D7F   18ED7F   1235          ANDI  FTR,X'7F'          *
003A 2A2E00   18AE00   1236          LBI   FBO,0              *SET CONTROLLER 0 ADDRESS
003B 0A2506   08A506   1237          LBI   FTG,6              *RESET FBI
003C 2A2540   18A540   1238          LBI   FTG,SELHOLD        *RAISE SELECT HOLD
003D 0A2603   08A603   1239          LBI   FTO,X'03'          *SELECT CONTROLLER
003E 2013B5   1013B5   1240          BU    TIPNOCHK           *TAG FLIPPER
003F 0A260A   08A60A   1241          LBI   FTO,RDCNTL         *READ AND RESET
0040 0A2E40   08AE40   1242          LBI   FBO,X'40'          *  CE ALERT TAG
0041 2013B5   1013B5   1243          BU    TIPNOCHK           *TAG FLIPPER
0042 2A2E00   18AE00   1244          LBI   FBO,0              *
0043 0A260C   08A60C   1245          LBI   FTO,X'0C'          *RESET CE HI DISPLAY
0044 2013B5   1013B5   1246          BU    TIPNOCHK           *TAG FLIPPER
0045 2A260D   18A60D   1247          LBI   FTO,X'0D'          *RESET CE LO DISPLAY
0046 2013B5   1013B5   1248          BU    TIPNOCHK           *TAG FLIPPER
0047 0E25BF   08E5BF   1249          ANDI  FTG,FF-SELHOLD     *DESELECT DRIVE
0048 0A0001   088001   1250 TRSRST3X LBI   L0,X'01'          *INITIALIZE TO DRIVE 2
0049 2A0140   188140   1251          LBI   L1,X'40'           *INITIALIZE BSDA TO DRIVE 2
004A 0011F8   0011F8   1252 TRSNXTDR BU    TIPSLECT           *SELECT DRIVE
004B 0A2684   08A684   1253          LBI   FTO,RDSTATUS       *READ MODULE STATUS TAG
004C 2013B5   1013B5   1254          BU    TIPNOCHK           *TAG FLIPPER
004D 2B0822   1C8822   1255          MV    L8,FBI             *SAVE FILE BUS IN
004E 2A2689   18A689   1256          LBI   FTO,SNSINFC        *SENSE INTERFACE TAG
004F 2013B5   1013B5   1257          BU    TIPNOCHK           *TAG FLIPPER
0050 0B2E00   0CAE00   1258          MV    FBO,L0             *
0051 2A2601   18A601   1259          LBI   FTO,SETUNSUP       *RESET UNSUPPRESSABLE REGS TAG
0052 2013B5   1013B5   1260          BU    TIPNOCHK           *TAG FLIPPER
0053 00139C   00139C   1261          BU    TIPUCWPT           *GENERATE UCW POINTER IN L6
0054 0A07E8   0887E8   1262          LBI   L7,-24             *INIT COUNTER TO RESET 24 SENSE BYTES
0055 274857   1D4857   1263          TIBOF ATTN,L8,TRSNOATT   *GO IF NO DATA MODULE ATTENTION
0056 0A07DE   0887DE   1264          LBI   L7,-34             *CHANGE CNTR TO RESET SENSE/USAGE CNT
0057 200180   100180   1265 TRSNOATT BU    TRSNSLP            *GO TO DO RESET
0058 2A268F   18A68F   1266          LBI   FTO,CONTROL        *RESET DATA MODULE
0059 0A2E04   08AE04   1267          LBI   FBO,RSTATTN        *  ATTENTION TAG
005A 2013B5   1013B5   1268          BU    TIPNOCHK           *TAG FLIPPER
005B 2A2E0C   18AE0C   1269          LBI   FBO,CHKRST         *DRIVE CHECK RESET
005C 2013B5   1013B5   1270          BU    TIPNOCHK           *TAG FLIPPER
005D 060260   084260   1271          TBOFF 0,L2,*+3           *GO IF NOT IMPL
005E 0A2E02   08AE02   1272          LBI   FBO,REZERO         *XMIT REZERO TO DRIVE
005F 2013B5   1013B5   1273          BU    TIPNOCHK           *TAG FLIPPER
0060 0A2609   08A609   1274          LBI   FTO,XMITCNTL       *CONTROLLER
0061 0A2E80   08AE80   1275          LBI   FBO,X'80'          *  RESET TAG
0062 2013B5   1013B5   1276          BU    TIPNOCHK           *TAG FLIPPER
0063 0E25BF   08E5BF   1277          ANDI  FTG,FF-SELHOLD     *DESELECT DRIVE
0064 0ECOFF   08COFF   1278          ADDI  L0,FF              *UPDATE DRIVE ADDRESS
0065 2F0101   1CC101   1279          ADD   L1,L1              *SHIFT BSDA TO NEXT LOWER DRIVE
0066 20404A   11004A   1280          BNZ   TRSNXTDR           *GO IF MORE DRIVES TO GO
0067 26026D   18426D   1281          TBOFF 0,L2,TRSEXTRG      *GO IF NOT IMPL
0068 2EC001   18C001   1282 TRS100MS ADDI  L0,1                *100 MS TIMER
0069 0F4110   0DC110   1283          ADDC  L1,ZER             *  FOR REZERO TO
006A 028068   0A0068   1284          BNC   TRS100MS           *    COMPLETE
006B 0E027F   08C27F   1285          ANDI  L2,X'7F'           *RESET IMPL MARK
006C 200048   100048   1286          B     TRSRST3X           *GO RESET ALL DRIVES AGAIN
                       1287 *                                                          *
006D 0E6D80   09ED80   1288 TRSEXTRG ORI   FTR,X'80'          *
006E 0A2D08   08AD08   1289          LBI   FTR,X'08'          *DISABLE ERROR TRAP
                       1290 *                                                          *
                       1291 *   INITIALIZE FOR IDLE LOOP                               *
```

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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       1292 *                                  *
006F 258271   164271    1293          TBON  6,L2,*+2          *GO IF NOT SYSTEM RESET
0070 200082   100082    1294          BU    TRSLSRST          *RESET ALS,DLS,MODE,LOCAL REGS
0071 28BFC0   128FC0    1295          SADI  INDEXIT,X'C0'     *UNMASK TRAPS
0072 200104   100104    1296          B     TRSTRAPA          *FORCE TRAP A ADDRESS
                       1297 *
0073 086FBF   028FBF    1298 TRSEXIT  SADI  INDEXIT,X'BF'     *RESTORE TRAP A POINTER
0074 099490   069490    1299          SMODE ZER,20            *SET MODE BUFFER FOR EXTERNAL TRAP
0075 08E100   03A100    1300          SLKI  1,0               *RESET PREVENT I/O FLIP LATCH IN SVP
0076 2A081F   18861F    1301          LBI   L8,D(SKMARK1)     CS DISPL POINTS TO SK MARKS
0077 044890   014890    1302          SINC  ZER,L8,1          ZERO SK MARK 1
0078 044890   014890    1303          SINC  ZER,L8,1          ZERO SK MARK 2
0079 0408C7   0048C7    1304          LINC  L7,L8,0           GET  SVP OPTION BYTE
007A 0E0780   08C780    1305          ANDI  L7,ALOW12         ZERO SVP OPTIONS EXCEPT ALLOW 12MB
007B 240887   104887    1306          SINC  L7,L8,0           RESTORE BYTE
007C 0A083A   08883A    1307          LBI   L8,D(EFSENSEL)    CS DISPL POINTS TO EF SENSE
007D 240890   104890    1308          SINC  ZER,L8,0          ZERO DM ATTN PENDING MARKS
007E 2A27FF   18A7FF    1309          LBI   FHF,FF            RESET FHF, PARTICULARLY BIT 7
007F 001202   001202    1310          B     TIPIDLE           *GO TO IDLE LOOP
                       1311          MbLOK                   *
0100                   1312+         DS    <0>B
                       1313 *                                  *
                       1314 *   SENSE BYTE ZERO SUBROUTINE     *
                       1315 *                                  *
0100 244690   114690    1316 TRSNSLP  SINC  ZER,L6,1          *ZERO 1 BYTE
0101 0EC701   08C701    1317          ADDI  L7,1              *INCREMENT COUNTERS
0102 028100   0A0100    1318          BNC   TRSNSLP           *GO TO NOT DONE
0103 0F90D0   0ED0D0    1319          EORU  ZER,ZER           *RETURN TO CALLING ROUTINE
                       1320 *                                  *
                       1321 ************************************************************
                       1322 *           ERROR TRAP (A) ROUTINE
                       1323 *   TRAP A CONDITIONS ARE:
                       1324 *        1. SYSTEM RESET (FHF BIT 0)
                       1325 *        2. TIMEOUT (ADS B2)
                       1326 *        3. FRONT END CHECKS (HES B1,2,4,7; ADS B3-7)
                       1327 *        4. ERROR ALERT (FTI B7)
                       1328 *
                       1329 ************************************************************
                       1330 *                                  *
0104 0E2FF1   08EFF1    1331 TRSTRAPA ANDI  SCN,FF-ALWFXFR-FILEODD-TOFILE  RESET FILE XFER HARDWARE
0105 0A2300   08A300    1332          LBI   DST,0             *RESET CHANNEL TRANSFER HARDWARE
0106 062708   086708    1333          TBOFF 0,FHF,*+2         *GO IF NOT SYSTEM RESET
0107 00002F   00002F    1334 TRSFORCE B     TRSYSRST          *
0108 0AE104   08A104    1335          LLKR  L4,1              SAMPLE SVP REQUEST LATCH
0109 058407   064407    1336          TIBON SVPREQ,L4,TRSFORCE  GO SYS RST IF ON
010A 2B0435   1C8435    1337          MV    L4,FTI            *SAVE FTI,HES
010B 0B002B   0C802B    1338          MV    L0,HES            *  ADS FOR SENSE
010C 0B0129   0C8129    1339          MV    L1,ADS            *     ASSEMBLY ROUTINE
010D 2A0820   188820    1340          LBI   L8,X'20'          *SET FORMAT 2, MESSAGE 0
010E 0ED001   08D001    1341          ADDI  ZER,1             WAIT--IN CASE TRAP
010F 22810E   1A010E    1342          BNC   *-1                  OCCURS DURING SET R/W
0110 2E257B   18E57B    1343          ANDI  FTG,FF-TAGATE-FOTOFI DROP TAG GATE, DIAG GATE IF UP
0111 20099A   10099A    1344          BU    TEFRESP           DROP NE OR CE IN CASE THEY'RE UP
0112 27C414   1F4414    1345          TBOFF 7,L4,*+2          *GO IF NOT ERROR ALERT
0113 2A0810   188810    1346          LBI   L8,X'10'          *SET FORMAT 1, MESSAGE 0
0114 0A0703   088703    1347          LBI   L7,X'03'          *POST EQUIPMENT CHECK
0115 0A1000   089000    1348          LBI   ZER,0             *RESTORE ZER
0116 099890   069890    1349          SMODE ZER,24            *INIT MODE BUFFER FOR BASE
0117 089801   029801    1350          SABI  MIARBB,B(TRSERREG)  *INIT MIAR
0118 08881D   02881D    1351          SADI  MIARBD,D(TRSERREG)  *  FOR BASE
0119 0E6D08   09ED08    1352          ORI   FTR,X'08'         *DISABLE TRAP A
011A 28BFC0   12BFC0    1353          SADI  INDEXIT,X'C0'     *CHANGE INDEX TO GO FROM
011B 200104   100104    1354          B     TRSTRAPA          *  EXTERNAL TRAP TO BASE
011C 02011C   08011C    1355          NOP   *                 *
                       1356 *                                  *
011D 08BFBF   02BFBF    1357 TRSERREG SADI  INDEXIT,X'BF'     *RESTORE INDEX
011E 001909   001909    1358          B     TSNNORM+1         *GO TO SENSE ASSEMbLY ROUTINE
                       1359 *
                       1360          END COPY-MEMBER TRS12
                       1361      COPY      TCU12
```



```
LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       1362 ************************************************
                       1363 *  CLEANUP
                       1364 ************************************************
                       1365 *
011F 0011F4   0011F4    1366 TCUSTART BU    TIPBSGEN          GENERATE BSDA (L3=0-3, L2=4-7)
0120 278B23   1E4B23    1367          TIBOF UNITCHK,STAT,*+3  GO IF NO UNIT CHECK STATUS
0121 2B0103   1C8103    1368          MV    L1,L3             COPY BSDA TO L1
0122 2001C4   1001C4    1369          BU    TCUSETUC          SET UNIT CHECK STATUS IN SB0
0123 07CB26   0F4B26    1370          TIBOF SKCMPL,STAT,*+3   GO IF NO SEEK COMPLETE STATUS
0124 2001C8   1001C8    1371          BU    TCURSTSB          RESET SEEK BUSY
0125 0B2302   0CA302    1372          MV    DST,L2            POST SEEK COMPLETE
0126 0B370B   0CB70B    1373          MV    SB1,STAT          POST OTHER STATUS IN SB1
0127 0E2380   08E380    1374          ANDI  DST,IOPBUSY       RESET ATTACHMENT BUSY
0128 2A0820   188820    1375          LBI   L8,D(SKMARK2)     GET SEEK MARKS
0129 240890   104890    1376          SINC  ZER,L8,0          ZERO MARKS
                       1377 ****************
                       1378 *   SPECIAL NOTE:  THE CONTENTS OF C.S. ADDRESS 012A WILL ALWAYS BE THE
                       1379 *                  FIRST BYTES WRITTEN ON DISK ON CYL 0 HD 2, R1 (OR
                       1380 *                  ALTERNATE ASSN). THESE BYTES ARE LOADED FIRST IN
                       1381 ****************   C.S. FROM DISK ON IPL.
012A 0E6D08   09ED08    1382          ORI   FTR,ERRTRAP        DISABLE ERROR TRAP
012B 088520   028520    1383          SABI  INDEXF1,IDXDDCF   SET FILE INDEX TO POINT TO DDCF
012C 288720   128720    1384          SABI  INDEXF2,IDXDDCF   "   "   "   "   "   "   "
012D 08A600   02A600    1385          SADI  DISPFC,D(DDCFORGL)  FILE DDCF TRAP DISP TO DDCF ORIGIN
012E 28D14A   13914A    1386          SZI   ZLSFC,ZLSRFILE     READ FROM FILE TO DDCF BUFFER
012F 08AA00   02AA00    1387          SADI  DISPFD,D(DDDFORG)  FILE DDDF TRAP DISP TO DDDF ORIGIN
0130 28D24A   13924A    1388          SZI   ZLSFD,ZLSRFILE    READ FROM FILE TO DDDF BUFFER
0131 0E257F   08E57F    1389          ANDI  FTG,X'7F'         DROP FILE TAG GATE
0132 0A2500   08A500    1390          LBI   FTG,X'00'         RESET FILE TAGS AND SELECT HOLD
0133 0A2300   08A300    1391          LBI   DST,0             RESET DST, SAVE SEEK COMPLETE'S
0134 0E2D28   08ED28    1392          ANDI  FTR,ERRTRAP+DMATTN  RESET FTR EXCEPT DM ATTN INTRPT
0135 2E27D9   18E7D9    1393          ANDI  FHF,FF-SCNSAT-SCNEQ-ERRMODE RESET FHF
0136 2A3300   188300    1394          LBI   DXC,X'00'         RESET DXC
0137 0A2F00   08AF00    1395          LBI   SCN,X'00'         RESET SCN
0138 2A0900   188900    1396          LBI   GEN1,X'00'        RESET MARKS
0139 2A1100   189100    1397          LBI   CEB1,X'00'        RESET MARKS
013A 2E1208   18D208    1398          ANDI  CEB2,WHAOK        RESET MARKS, SAVE WRITE HA OK BIT
013B 0A1300   089300    1399          LBI   MSC1,X'00'        RESET MARKS
013C 2A1400   189400    1400          LBI   MSC2,X'00'        RESET MARKS
013D 0A0B00   088B00    1401          LBI   STAT,X'00'        ZERO STAT REG
013E 2A001E   18801E    1402          LBI   L0,D(UCWPTR)      FETCH DISPLACEMENT OF UCW POINTER
013F 0400C6   0040C6    1403          LINC  L6,L0,0           FETCH CURRENT DEVICE POINTER
0140 0EC618   0BC618    1404          ADDI  L6,24             DISPLACEMENT TO CURRENT PHYS ADDR
0141 24468E   11468E    1405          SINC  PAC,L6,1          STORE CURRENT
0142 24068F   10468F    1406          SINC  PAH,L6,0            PHYSICAL ADDRESS FOR DEVICE
0143 001202   001202    1407          B     TIPIDLE           GO TO IDLE POINT
                       1408 *
                       1409 ************************************************
                       1410 *  SUBROUTINE TO SET UNIT CHECK ACCORDING TO L1
                       1411 ************************************************
                       1412 *
0144 2B043F   1C843F    1413 TCUSETUC MV    L4,SB0            COPY SB0
0145 2E04F0   18C4F0    1414          ANDI  L4,X'F0'          MASK OFF SEEK BUSY BITS
0146 2F4441   1DC441    1415          OR    L4,L1             OR IN UNIT CHECK
0147 0B3F84   0CBF84    1416          MVU   SB0,L4            SET UNIT CHECK IN SB0 AND RETURN
                       1417 *
                       1418 ************************************************
                       1419 *  SUBROUTINE TO RESET SEEK BUSY ACCORDING TO L2
                       1420 ************************************************
                       1421 *
0148 0B0402   0C8402    1422 TCURSTSB MV    L4,L2             COPY BSDA
0149 0E44F0   09C4F0    1423          ORI   L4,X'F0'          DON'T RESET UNIT CHECKS
014A 0F3FC4   0CFFC4    1424          ANDU  SB0,L4            RESET SEEK BUSY AND RETURN
                       1425 *
                       1426 ************************************************************************
                       1427 *     ROUTINE TO CONVERT CCHH TO 12 MB FORMAT
                       1428 *     REGISTERS AT THIS TIME:
                       1429 *          L0   -- POINTS TO CLO IN CS
                       1430 *          L1   -- POINTS TO CHI IN CS
                       1431 *          L3   -- FREE
```

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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       1432 *          L8   -- POINTS TO TSKPA(PAH) IN CS
                       1433 *          CHI  -- LOG CYL HIGH FOR 70MB FMT (MUST EQ TO ZERO)
                       1434 *          CLO  -- LOG CYL LOW FOR 70MB FMT (MUST BE LESS THAN 128)
                       1435 *          HEAD -- LOG HEAD FOR 70MB FMT (MUST BE LESS THAN 11)
                       1436 *
                       1437 ************************************************************************
                       1438 *
014B 0B0317  0C8317    1439 TCUCNV12 MV    L3,CLO              COPY CLO FOR TRIPLING
014C 2F1717  1CD717    1440          ADD   CLO,CLO             2 TIMES CLO
014D 055850  055850    1441          TBON  5,HEAD,*+3          GO IF HEAD/4 = 1
014E 271851  1C5851    1442          TBOFF 4,HEAD,*+3          GO IF HEAD/4 = 0
014F 2EC301  18C301    1443          ADDI  L3,1                INCR L3 BY 1
0150 2EC301  18C301    1444          ADDI  L3,1                INCR L3 BY 1
0151 2F1703  1CD703    1445          ADD   CLO,L3              ADD L3 TO CLO (NOW = PAC FOR 12MB)
0152 228154  1A0154    1446          BNC   *+2                 GO IF NO OVERFLOW
0153 0E5840  09D840    1447          ORI   HEAD,X'40'          OR IN CYL 256 BIT TO PAH
0154 2E1843  18D843    1448          ANDI  HEAD,X'43'          SAVE CYL 256 AND PAH
0155 07C898  0F4898    1449          SDEC  HEAD,L8,1           STORE PAH IN TSKPA
0156 244897  114897    1450          SINC  CLO,L8,1            STORE PAC IN TSKPA
0157 2440D7  1140D7    1451          LINC  CLO,LO,1            RESTORE CLO WITH LOG CYL VALUE
0158 07C0D8  0F40D8    1452          LDEC  HEAD,LO,1           RESTORE HEAD WITH LOG HEAD VALUE
0159 0F90D0  0ED0D0    1453          EORU  ZER,ZER             RETURN TO CALLING ROUTINE
                       1454 *
                       1455 ************************************                          -<GHD>-
                       1456 * COME HERE TO CHECK FOR A WRITE CMD                         -<GHD>-
                       1457 * IF WRITE IS NOT ENABLED                                    -<GHD>-
                       1458 ************************************                          -<GHD>-
                       1459 *                                                            -<GHD>-
015A 254C67  154C67    1460 TCUCKWRT TBON  5,OBYT,TCUCKSIZ     CHECK FOR                 -<GHD>-
015B 078C67  0E4C67    1461          TBOFF 6,OBYT,TCUCKSIZ          WRITE COMMAND        -<GHD>-
015C 05CC67  074C67    1462          TBON  7,OBYT,TCUCKSIZ     GO IF NOT WRITE           -<GHD>-
015D 0A0800  088800    1463          LBI   LP,X'00'            POST FORMAT 0, MSG 0      -<GHD>-
015E 0A0781  088781    1464          LBI   L7,X'81'            POST INTERV REQ'D - WRT INHIBITED
015F 280103  1C8103    1465 TCUDHERR MV    L1,L3               MOVE BSDA TO L1 FOR SUBROUTINE
0160 2001C4  1001C4    1466          BU    TCUSETUC            TURN ON UNIT CHECK FOR - TIO-<GHD>-
0161 0E6D40  09ED40    1467          ORI   FTR,ICATTN          TURN ON IO ATTENTION LIGHT -<GHD>-
0162 0A2684  08A684    1468          LBI   FTO,RDSTATUS        CHANGE TAG TO READ MODULE STATUS
0163 201385  101385    1469          BU    TIPNOCHK            TO TAG FLIPPER            -<GHD>-
0164 252263  146263    1470          TIBON ONLINE,FBI,*-1      LOOP UNTIL DRIVE GOES OFF LINE
0165 2E2DBF  18EDBF    1471          ANDI  FTR,FF-IOATTN       TURN OFF IO ATTENTION LIGHT -<GHD>-
0166 201908  101908    1472          B     TSNNORM             GO TO ERROR ROUTINE AND NOP COMMAND
                       1473 *                                                            -<GHD>-
0167 200F6A  100F6A    1474 TCUCKSIZ B     TIOCKSIZ            GO TO CHECK FOR CORRECT SIZE -<GHD>-
                       1475          END COPY-MEMBER TCU1
                       1476       COPY    TDS
                       1477 ************************************************
                       1478 *  THIS SUBROUTINE READ OR WRITE THE G4 GAP
                       1479 *      (128 BYTES) FOR A MOVED FIELD
                       1480 ************************************************
                       1481 *
0168 2A260E  18A60E    1482 TDSRDG4  LBI   FTO,READOP          SET READ OP
0169 2A2E30  18AE30    1483          LBI   FBO,RDG4            SET READ G4 MODIFIER
016A 20016D  10016D    1484          B     TDSMRG
                       1485 *
016B 0A260F  08A60F    1486 TDSWRG4  LBI   FTO,WRITEOP         SET WRITE OP
016C 0A2EB0  08AEB0    1487          LBI   FBO,WRG4            SET WRITE G4 MODIFIER
016D 2E6580  19E580    1488 TDSMRG   ORI   FTG,TAGATE          RAISE TAG GATE
016E 0E1F1F  08DF1F    1489          ANDI  FFLG,X'1F'          RESET DEFECT MARKS IN FLAG
016F 2B1E10  1C9E10    1490          MV    SDL,ZER             ZERO SD
0170 0A0806  088806    1491          LBI   L8,6                INITIALIZE TIMER
0171 047575  017575    1492 TDSLOP1  TIBON TAGVALID,FTI,TDSWR1 GO IF TAG VALID
0172 2EC8FF  18C8FF    1493          ADDI  L8,X'FF'            DECREMENT TIMER BY 1
0173 204171  110171    1494          BNZ   TDSLOP1             GO WAIT IF TIMER NOT ZERO
0174 000706  000706    1495          B     TEFL401             GO POST NO RESPONSE ERROR
0175 0E257F  08E57F    1496 TDSWR1   ANDI  FTG,FF-TAGATE       DROP TAG GATE
0176 0A08FF  0888FF    1497          LBI   L8,X'FF'            LOAD TIMER
0177 253578  147578    1498 TDSLOP2  TIBON NORMEND,FTI,TDSWR2  GO IF NORMAL END RETURNED
0178 2EC8FF  18C8FF    1499          ADDI  L8,X'FF'            DECR TIMER
0179 204177  110177    1500          BNZ   TDSLOP2             GO WAIT IF TIMER NOT ZERO
017A 20072A  10072A    1501          B     TEFNORSP            GO POST NO RESPONSE ERROR
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

017B 00091A  00091A    1502 TDSWR2   B     TEFRESP             DROP RESPONSE GATE AND RETURN
                       1503 *
                       1504 *
                       1505          MBLOK
017C 20017C  10017C    1506+         B     *                   UNUSED  ::::::::::::
017D 00017D  00017D    1507+         B     *                   UNUSED  ::::::::::::
017E 00017E  00017E    1508+         B     *                   UNUSED  ::::::::::::
017F 20017F  10017F    1509+         B     *                   UNUSED  ::::::::::::
0200                   1510+         DS    <0>B
                       1511 ************************************************
                       1512 *  THIS SUBROUTINE GENERATES DISPLACEMENTS USED
                       1513 *       BY DEFECT SKIP ANALYSIS ROUTINE
                       1514 ************************************************
                       1515 *
0200 2A0201  18d201    1516 TDSDCON  LBI   L2,1                  L2 AND L3 USED FOR DISP CONSTANT
0201 280414  1C8414    1517          MV    L4,MSC2               MOVE DATA LENGTH 256 TO L4
0202 0E0401  08C401    1518          ANDI  L4,1                  MASK OFF UNWANTED BITS
0203 0B0518  0C8518    1519          MV    L5,DCNT               MOVE DATA LENGTH LOW TO L5
0204 071406  0C5406    1520          TIBOF DLO,MSC2,*+2          GO IF DATA LENGTH NOT EQUAL ZERO
0205 0A0501  088501    1521          LBI   L5,1                  SET DATA LENGTH TO 1
0206 24DA0A  135A0A    1522          TBON  3,KCNT,TDSDC1         *******
0207 2A03D4  1883D4    1523          LBI   L3,212
0208 0A0200  088200    1524          LBI   L2,0
0209 20020D  10020D    1525          B     TDSDC2                FOR KL=0, DISP1=212+DL
020A 0A031F  08831F    1526 TDSDC1   LBI   L3,31
020B 0F031A  0CC31A    1527          ADD   L3,KCNT
020C 0F4210  0DC210    1528          ADDC  L2,ZER                FOR KL~=0, DISP1=287+KL+DL
020D 2F0305  1CC305    1529 TDSDC2   ADD   L3,L5
020E 0F4204  0DC204    1530          ADDC  L2,L4                 ******
020F 0E82FF  0AC2FF    1531          EORI  L2,X'FF'              FORM THE 1'S COMPLEMENT
0210 2E83FF  1AC3FF    1532          EORI  L3,X'FF'                    OF DISP1
0211 04C416  034416    1533          TBON  3,L4,TDSDC3           GO IF DL=256
0212 0CC5EC  03C5EC    1534 TDSDCC   TADDI L5,236                TEST FIELD LENGTH
0213 C08216  020216    1535          BCY   TDSDC3                GO IF GREATER THAN 19
0214 2A058B  18858B    1536          LBI   L5,139                DISP2/3=139 FOR SHORT FIELD
0215 000218  000218    1537          B     TDSDC4
0216 0EC57E  08C57E    1538 TDSDC3   ADDI  L5,126                DISP2/3=126+(FIELD LENGTH)
0217 0F4410  0DC410    1539          ADDC  L4,ZER                      FOR LONG FIELD
0218 0E84FF  0AC4FF    1540 TDSDC4   EORI  L4,X'FF'              FORM THE 1'S COMPLEMENT
0219 2E85FF  1AC5FF    1541          EORI  L5,X'FF'                    OF DISP2/3
021A 255F21  155F21    1542          TBON  5,FFLG,TDSDISP        GO IF DISP2 JUST FORMED
0218 2B0604  1C8604    1543          MV    L6,L4                 MOVE THE 1'S COMPLEMENT OF
021C 2B0705  1C8705    1544          MV    L7,L5                       DISP3 TO L6,L7
021D 0A0400  088400    1545          LBI   L4,0
021E 2B051A  1C851A    1546          MV    L5,KCNT               COPY KCNT TO FORM DISP2
021F 2E5F04  19DF04    1547          ORI   FFLG,X'04'            TURN ON INDICATOR FOR EXIT
0220 24DA12  135A12    1548          TBON  3,KCNT,TDSDCC         GO IF KCNT NOT ZERO
0221 0E1FFB  08DFFB    1549 TDSDISP  ANDI  FFLG,X'FB'            TURN OFF INDICATOR
0222 289A85  129A85    1550          SABI  BLOCKB,B(DSDISP1+X'8000')  SET BLOCK ADDR IN ALS
0223 0A0008  088008    1551          LBI   LO,D(DSDISP1)         SET DISPLACEMENT ADDRESS
0224 058082  064082    1552          SINC  L2,LO,6               STORE DISP1/2/3 IN CS
0225 0A04DD  0884DD    1553          LBI   L4,X'DD'              INITIALIZE TRACK CAPACITY COUNTER
0226 2A05F9  1885F9    1554          LBI   L5,X'F9'                TO 2'S COMPLEMENT OF DEC(8711)
0227 0E82FF  0AC2FF    1555          EORI  L2,X'FF'              USE DISP1 TO GENERATE RECORD LENGTH
0228 2E83FF  1AC3FF    1556          EORI  L3,X'FF'              >
0229 2A07D3  1887D3    1557          LBI   L7,-45                >>
022A 2A06FF  1886FF    1558          LBI   L6,X'FF'              >>>>  RECORD LENGTH = DISP1 - 45
022B 0F0703  0CC703    1559          ADD   L7,L3                 >>
022C 2F4602  1DC602    1560          ADDC  L6,L2                 >>
022D 040084  004084    1561          SINC  L4,LO,0               STORE TRK CAP CNTR AND REC LENGTH
022E 089A05  029A05    1562          SABI  BLOCKB,B(DSDISP1)     RESTORE BLOCK ADDR
022F 0F90D0  0ED0D0    1563          EORU  ZER,ZER               RETURN TO CALLER
                       1564 ************************************************
                       1565 *  THIS SUBROUTINE UPDATES THE TRACK CAPACITY
                       1566 *       COUNTER IF COMMAND IS FORMAT WRITE
                       1567 ************************************************
                       1568 *
0230 265152  195152    1569 TDSUPTRK TIBOF FMTWR,CEB1,TDSEXIT  GO IF NOT FORMAT WRITE
0231 05555D  05555D    1570          TIBON CMPDAT,FLAG,TDSDOSD GO IF WRCCD CMD                 -<CD>-
0232 275F34  1D5F34    1571          TIBOF CMPDAT,FFLG,*+2       GO IF TRK FMT IS  COMPATIBLE
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0233 04D962   035962  1572          TBON  3,REC,TDSINVTK      GO IF ORG REC NOT 1
0234 0442C6   0142C6  1573          LINC  L6,L2,1             FETCH TRACK
0235 07C2C7   0F42C7  1574          LDEC  L7,L2,1                  CAPACITY COUNTER
0236 05E653   076653  1575          TBON  7,FTO,TDSRECLN      GO IF WRITING
0237 2440C3   1140C3  1576 TDSFORRO LINC  L3,LO,1            FETCH KEY LENGTH
0238 26C1C4   1B41C4  1577          LDEC  L4,L1,5             FETCH DL HIGH
0239 0680C5   0A40C5  1578          LDEC  L5,LO,6             FETCH DL LOW
023A 2D4445   15C445  1579          TOR   L4,L5               TEST DATA LNGTH FOR ZERO
023B 00423D   01023D  1580          BNZ   *+2                 GO IF DL NOT ZERO
023C 0A0501   088501  1581          LBI   L5,1                SET DL TO 1
023D 04C341   034341  1582          TBON  3,L3,TDSUP1         GO IF KL NOT ZERO
023E 2EC5A7   1BC5A7  1583          ADDI  L5,167              ADD G3,ECC,G2,ECC
023F 0F4410   0DC410  1584          ADDC  L4,ZER                   TO DATA LENGTH
0240 200245   100245  1585          B     TDSUP2              GO UPDATE TRK CAP CNTR
0241 2EC5F2   1BC5F2  1586 TDSUP1   ADDI  L5,242              ADD G3,ECC,G2,ECC,G2,ECC
0242 0F4410   0DC410  1587          ADDC  L4,ZER                   TO DATA LENGTH
0243 2F0503   1CC503  1588          ADD   L5,L3               ADD THE KEY
0244 0F4410   0DC410  1589          ADDC  L4,ZER                   LENGTH ALSO
0245 0F0705   0CC705  1590 TDSUP2   ADD   L7,L5               UPDATE TRACK
0246 2F4604   1DC604  1591          ADDC  L6,L4                    CAPACITY COUNTER
0247 2C1FE0   10DFE0  1592          TANDI FFLG,X'E0'          TEST ANY DEFECT
0248 00424F   01024F  1593          BNZ   TDSCKSRH            GO IF THERE IS
0249 0D5E5D   05DE5D  1594          TOR   SDL,SDH             TEST SD=0                    -<CD>-
024A 22424F   19024F  1595          BZ    TDSCKSRH            GO IF YES
024B 2E85FF   1AC5FF  1596          EORI  L5,X'FF'            FORM THE 1'S COMPLEMENT
024C 0E84FF   0AC4FF  1597          EORI  L4,X'FF'                 OF RECORD LENGTH
024D 2FDE05   1FDE05  1598          ADDI  SDL,L5              SUBTRACT SKIP DISPLACEMENT
024E 2F5D04   1DDD04  1599          ADDC  SDH,L4                   BY RECORD LENGTH
024F 065253   095253  1600 TDSCKSRH TIBOF SRCH,CEB2,TDSRECLN   GO IF NOT SEARCHING
0250 244286   114286  1601 TDSSTRTC SINC  L6,L2,1             RESTORE TRACK CAPACITY CNTR
0251 27C287   1F4287  1602          SDEC  L7,L2,1                  TO CONTROL STORE
0252 0F90D0   0ED0D0  1603 TDSEXIT  EORU  ZER,ZER             RETURN TO CALLING ROUTINE
                      1604 *
0253 0EC202   0BC202  1605 TDSRECLN ADDI  L2,2                UPDATE CS POINTER
0254 2442C4   1142C4  1606          LINC  L4,L2,1             FETCH PRESET RECORD
0255 0742C5   0D42C5  1607          LDEC  L5,L2,3                  LENGTH FROM CS
0256 0F0705   0CC705  1608          ADD   L7,L5               INCREMENT TRACK
0257 2F4604   1DC604  1609          ADDC  L6,L4                    CAPACITY COUNTER
0258 028250   0A0250  1610          BNC   TDSSTRTC            GO IF NO OVERFLOW
0259 2E5301   19D301  1611          ORI   MSC1,TRKOFL         TURN ON EVEN TRK OVERFLOW MARK
025A 2A06DD   1886DD  1612 TDSRSTCT LBI   L6,X'DD'            INITIALIZE TRACK
025B 0A07F9   0887F9  1613          LBI   L7,X'F9'                 CAPACITY COUNTER (8711)
025C 000250   000250  1614          B     TDSSTRTC            GO STORE TRK CAP COUNTER
                      1615 *
                      1616 *
025D 25E66B   17666B  1617 TDSDOSD  TBON  7,FTO,TDSSREC       GO IF ACTUALLY WRITING       -<CD>-
025E 045252   015252  1618          TIBON SRCH,CEB2,TDSEXIT   GO IF STILL SEARCHING        -<CD>-
025F 055F64   055F64  1619          TIBON CMPDAT,FFLG,TDSFGOK    GO IF SPEC FLAG BIT ON    -<CD>-
0260 2E5F04   19DF04  1620          ORI   FFLG,CMPDAT          TURN ON CMPR DATA FLAG       -<CD>-
0261 275272   1D5272  1621          TBOFF 5,CEB2,TDSAFTRO     GO IF END OF RO COUNT FIELD  -<CD>-
0262 241275   105275  1622 TDSINVTK TIBON READ,CEB2,TDSINVCF  GO POST INV CTRL FLD IF RD CKD DIAG
0263 200870   100870  1623          B     TEFINVTK            GO POST INVALID TRK FMT ERR  -<CD>-
0264 2C1FE0   10DFE0  1624 TDSFGOK  TANDI FFLG,X'E0'          TEST FOR ANY DEFECT          -<CD>-
0265 00426B   01026B  1625          BNZ   TDSSREC             GO IF THERE IS               -<CD>-
0266 0D5E5D   05DE5D  1626          TOR   SDL,SDH             GO IF SD                     -<CD>-
0267 22426B   19026B  1627          BZ    TDSSREC                IS ZERO                 -<CD>-
0268 0A04FA   0884FA  1628          LBI   L4,X'FA'            SUBTRACT 1415 (REC LENGTH)   -<CD>-
0269 2EDE6E   18DE6E  1629          ADDI  SDL,X'6E'                FROM SKIP               -<CD>-
026A 2F5D04   1DDD04  1630          ADDC  SDH,L4                       DISPLACEMENT        -<CD>-
026B 05CF6E   074F6E  1631 TDSSREC  TBON  7,PAH,TDSODDTK       GO IF ON THE ODD TRACK       -<CD>-
026C 2C9918   12D918  1632          TEORI REC,24              CHECK FOR RECORD 24          -<CD>-
026D 224270   190270  1633          BZ    TDSSOVFL            GO IF IT IS; SET TRK OVFL MK -<CD>-
026E 2C9930   12D930  1634 TDSODDTK TEORI REC,48              CHECK FOR RECORD 48          -<CD>-
026F 204271   110271  1635          BNZ   TDSSEXIT            GO IF NOT                    -<CD>-
0270 2E5301   19D301  1636 TDSSOVFL ORI   MSC1,TRKOFL         SET TRACK OVERFLOW MARK      -<CD>-
0271 0F90D0   0ED0D0  1637 TDSSEXIT EORU  ZER,ZER             RETURN                       -<CD>-
                      1638 *                                                             -<CD>-
0272 2A0600   188600  1639 TDSAFTRO LBI   L6,0                INIT L6 AND L7 TO MERGE      -<CD>-
0273 0A0700   088700  1640          LBI   L7,0                   TO COMMON ROUTINE TO      -<CD>-
0274 200237   100237  1641          B     TDSFORRO                  UPDATE SD AFTER RO CNT -<CD>-
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                      1642 *
0275 201818   10181B  1643 TDSINVCF B     TSKINVSK            GO POST INVALID CTRL FIELD   -<GHD>-
                      1644         MBLOK
0276 200276   100276  1645+        B     *                   UNUSED  ::::::::::::
0277 000277   000277  1646+        B     *                   UNUSED  ::::::::::::
0278 000278   000278  1647+        B     *                   UNUSED  ::::::::::::
0279 200279   100279  1648+        B     *                   UNUSED  ::::::::::::
027A 20027A   10027A  1649+        B     *                   UNUSED  ::::::::::::
027B 00027B   00027B  1650+        B     *                   UNUSED  ::::::::::::
027C 20027C   10027C  1651+        B     *                   UNUSED  ::::::::::::
027D 00027D   00027D  1652+        B     *                   UNUSED  ::::::::::::
027E 00027E   00027E  1653+        B     *                   UNUSED  ::::::::::::
027F 20027F   10027F  1654+        B     *                   UNUSED  ::::::::::::
0300                  1655+        DS    <0>B
                      1656 ***************************************************************
                      1657 *  THIS SUBROUTINE DETERMINES WHETHER THE DEFECT AFFECTS THE
                      1658 *       KEY FIELD, DATA FIELD OR THE NEXT COUNT FIELD
                      1659 ***************************************************************
                      1660 *
0300 04809D   02409D  1661 TDSSTART SINC  SDH,LO,2            STORE SKIP DISPL FOR
0301 25019E   14419E  1662          SINC  SDL,L1,4                 CURRENT COUNT FIELD
0302 04C09F   03409F  1663          SINC  FFLG,LO,3           STORE CURRENT FLAG BYTE
0303 044199   014199  1664          SINC  REC,L1,1            STORE CURRENT RECORD NUMBER
0304 24409A   11409A  1665          SINC  KCNT,LO,1           STORE CURRENT KEY COUNT
0305 26809B   1A409B  1666          SDEC  DCNT,LO,6           STORE CURRENT DL LOW
0306 2B0814   1C8814  1667          MV    L8,MSC2             COPY DL256
0307 0E0801   08C801  1668          ANDI  L8,DL256            MASK OFF UNWANTED BITS
0308 06C188   0B4188  1669          SDEC  L8,L1,5             STORE DL HIGH
0309 0D5D5E   05DD5E  1670          TOR   SDH,SDL             TEST FOR ZERO SD VALUES
030A 22433C   19033C  1671          BZ    TDSDONE             GO IF ZERO
030B 055F3D   055F3D  1672          TIBON CMPDAT,FFLG,TDS4DATA  GO IF COMPRESSED DATA FMT  -<CD>-
030C 2A0200   188208  1673          LBI   L2,D(DSDISP1)       SET CS POINTER TO DISP1
030D 0442C6   0142C6  1674          LINC  L6,L2,1             FETCH DISP1
030E 2442C7   1142C7  1675          LINC  L7,L2,1                  FROM CS
030F 0F071E   0CC71E  1676          ADD   L7,SDL              COMPARE DISP1
0310 0F461D   0DC61D  1677          ADDC  L6,SDH                   WITH SKIP DISPLACEMENT
0311 228317   1A0317  1678          BNC   TDSWFLD             GO IF DEFECT WITHIN RECORD
0312 2A1D00   189D00  1679          LBI   SDH,0               CALCULATE NEW
0313 2A1E2E   189E2E  1680          LBI   SDL,46                   SKIP DISPLACEMENT
0314 0F1E07   0CDE07  1681          ADD   SDL,L7                        FOR NEXT COUNT
0315 0F5D06   0DDD06  1682          ADDC  SDH,L6                             FIELD
0316 20033C   10033C  1683          B     TDSDONE             RETURN TO CALLER
                      1684 *       DETERMINE WHICH FIELD THE DEFECT AFFECTS
0317 2E9F40   1ADF40  1685 TDSWFLD  EORI  FFLG,DEFKEY          SET FLAG TO MOVE KEY FIELD
0318 24DA1B   135A1B  1686          TBON  3,KCNT,*+3          GO IF KCNT NOT ZERO
0319 0EC202   0BC202  1687          ADDI  L2,2                BUMP CS POINTER TO DISP3
031A 0E9F60   0ADF60  1688 TDSCKDAT EORI  FFLG,DEFKEY+DEFDAT  SET FLAG TO MOVE DATA FIELD
031B 0442C6   0142C6  1689          LINC  L6,L2,1             FETCH DISP2 FOR KEY FIELD
031C 2442C7   1142C7  1690          LINC  L7,L2,1                  OR DISP3 FOR DATA FIELD
031D 0F071E   0CC71E  1691          ADD   L7,SDL              TEST WHETHER DEFECT
031E 0F461D   0DC61D  1692          ADDC  L6,SDH                   IS WITHIN FIELD
031F 22832B   1A032B  1693          BNC   TDSCKMVS            GO TO CHK MOVE/SPLIT IF IT IS
0320 245F23   115F23  1694          TIBON DEFKEY,FFLG,*+3     GO IF KEY FIELD JUST CHECKED
0321 0E9FA0   0ADFA0  1695          EORI  FFLG,DEFCNT+DEFDAT  SET FLAG TO SAY MOVE NEXT CNT
0322 000337   000337  1696          B     TDSZSD              GO ZERO SD IN CURRENT COUNT
0323 2A1D00   189D00  1697          LBI   SDH,0               CALCULATE SD
0324 2A1E2E   189E2E  1698          LBI   SDL,46                   TO MEASURE
0325 2CDAEC   13DAEC  1699          TADDI KCNT,236
0326 228328   1A0328  1700          BNC   *+2
0327 0A1E34   089E34  1701          LBI   SDL,52
0328 0F1E07   0CDE07  1702          ADD   SDL,L7                        FROM END OF KEY
0329 0F5D06   0DDD06  1703          ADDC  SDH,L6                             TO DEFECT CENTER
032A 00031A   00031A  1704          B     TDSCKDAT            GO CHECK IF DEFECT AFFECTS DATA FLD
                      1705 *      COME HERE TO DETERMINE MOVE OR SPLIT FIELD
032B 245F2F   115F2F  1706 TDSCKMVS TIBON DEFKEY,FFLG,TDSDEKEY GO IF DEFECT IN KEY FIELD
032C 05D431   075431  1707          TIBON DL256,MSC2,TDSLONGF GO IF DL=256
032D 0CDBEC   03DBEC  1708          TADDI DCNT,236            TEST FOR SHORT OR LONG FIELD
032E 200330   100330  1709          B     TDSTSTSH
032F 2CDAEC   13DAEC  1710 TDSDEKEY TADDI KCNT,236            TEST FOR SHORT OR LONG FIELD
0330 028337   0A0337  1711 TDSTSTSH BNC   TDSZSD              GO IF SHORT FIELD -- MOVE FIELD
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0331 2A03FF   1883FF  1712 TDSLONGF LBI   L3,X'FF'
0332 2EDE7F   1BDE7F  1713          ADDI  SDL,127              TEST IF SKIP
0333 0F5D03   0DDD03  1714          ADDC  SDH,L3                   DISPL < 129
0334 028337   0A0337  1715          BNC   TDSZSD               GO IF IT IS -- MOVE FIELD
0335 2EDE02   1BDE02  1716          ADDI  SDL,2                CALCULATE 1ST SEG LENGTH
0336 200339   100339  1717          B     TDSSTRSD             GO UPDATE SD BYTES FOR CURRENT CNT
0337 2A1E00   189E00  1718 TDSZSD   LBI   SDL,0                ZERO SD LOW
0338 2A1D00   189D00  1719          LBI   SDH,0                ZERO SD HIGH
0339 04809D   02409D  1720 TDSSTRSD SINC  SDH,L0,2             STORE SD HIGH
033A 04019E   00419E  1721          SINC  SDL,L1,0             STORE SD LOW
033B 27809F   1E409F  1722          SDEC  FFLG,L0,2            STORE FLAG BYTE
033C 0F9DD0   0EDDD0  1723 TDSDONE  EORU  ZER,ZER              RETURN TO CALLING ROUTINE
                      1724 ************************************************************ -<CD>-
                      1725 *   THIS ROUTINE DETERMINES WHICH FIELD WITHIN THE          -<CD>-
                      1726 *      COMPRESSED RECORD THE DEFECT AFFECTS                 -<CD>-
                      1727 *                                                           -<CD>-
                      1728 *       0<= SD <129     MOVE  R1 DATA                       -<CD>-
                      1729 *     129<= SD <383     SPLIT R1 DATA  (1ST SEG = SD-129+2)  -<CD>-
                      1730 *     383<= SD <460     MOVE  R2 DATA                       -<CD>-
                      1731 *     460<= SD <714     SPLIT R2 DATA  (1ST SEG = SD-460+2)  -<CD>-
                      1732 *     714<= SD <791     MOVE  R3 DATA                       -<CD>-
                      1733 *     791<= SD <1045    SPLIT R3 DATA  (1ST SEG = SD-791+2)  -<CD>-
                      1734 *    1045<= SD <1122    MOVE  R4 DATA                       -<CD>-
                      1735 *    1122<= SD <1376    SPLIT R4 DATA  (1ST SEG = SD-1122+2) -<CD>-
                      1736 *    1376<= SD <1462    MOVE  NEXT COUNT FIELD              -<CD>-
                      1737 *    1462<= SD          DEFECT FURTHER DOWN (NEW SD=SD-1416) -<CD>-
                      1738 ************************************************************ -<CD>-
                      1739 *                                                           -<CD>-
033D 0A08FF   0888FF  1740 TDS4DATA LBI   L8,X'FF'              SET CONSTANT         -<CD>-
033E 2A07FD   1887FD  1741          LBI   L7,X'FD'                   ''              -<CD>-
033F 0A0601   088601  1742          LBI   L6,1                       ''              -<CD>-
0340 0EDE36   0BDE36  1743          ADDI  SDL,-202             SD =                  -<CD>-
0341 2F5D07   1DDD07  1744          ADDC  SDH,L7                    SD - 714         -<CD>-
0342 208354   120354  1745          BCY   TDSPAST2             GO IF SD>=0; DEFECT AFTER D2 -<CD>-
0343 2A0500   188500  1746          LBI   L5,0                 INITIALIZE REC FOR SDH -<CD>-
0344 0EDE48   0BDE48  1747 TDSD1D4  ADDI  SDL,75               SD =                  -<CD>-
0345 0F5D06   0DDD06  1748          ADDC  SDH,L6                    SD + 331         -<CD>-
0346 008350   020350  1749          CCY   TDSD2                GO IF SD>=0; DEFECT IN D2/D4 -<CD>-
0347 2EDEFE   1BDEFE  1750          ADDI  SDL,254              SD =                  -<CD>-
0348 2F5D10   1DDD10  1751          ADDC  SDH,ZER                   SD + 254         -<CD>-
0349 20834C   12034C  1752 TDSMVSP  BCY   TDSSPD1             GO IF SD>=0; SPLIT D1/D3 -<CD>-
034A 2A1E00   189E00  1753          LBI   SDL,0                SET SDL TO SAY MOVE D1/D3 -<CD>-
034B 20034D   10034D  1754          B     *+2                  -<CD>-
034C 2EDE02   1BDE02  1755 TDSSPD1  ADDI  SDL,2                ADJUST SDL TO 1ST SEG LENGTH -<CD>-
034D 0B1D05   0C9D05  1756          MV    SDH,L5               SET REC NUMBER TO SDH -<CD>-
034E 2E5F20   19DF20  1757          ORI   FFLG,DEFDAT          SET DEFECT IN DATA FLAG -<CD>-
034F 200339   100339  1758          B     TDSSTRSD             GO STORE SD AND FLAG -<CD>-
0350 2EC501   18C501  1759 TDSD2    ADDI  L5,1                 INCR REC NUMBER FOR SDH -<CD>-
0351 2EDEB3   18DEB3  1760          ADDI  SDL,-77              SD =                  -<CD>-
0352 2F5D08   1DDD08  1761          ADDC  SDH,L8                    SD - 77          -<CD>-
0353 000349   000349  1762          B     TDSMVSP              GO CHECK MOVE OR SPLIT -<CD>-
0354 0A0502   088502  1763 TDSPAST2 LBI   L5,2                 INIT REC NUMBER FOR SDH -<CD>-
0355 0EDE6A   0BDE6A  1764          ADDI  SDL,-150             SD =                  -<CD>-
0356 2F5D07   1DDD07  1765          ADDC  SDH,L7                    SD - 662         -<CD>-
0357 228344   1A0344  1766          BNC   TDSD1D4              GO IF SD>=0; DEFECT IN D3/D4 -<CD>-
0358 0EDEAA   0BDEAA  1767          ADDI  SDL,-86              SD =                  -<CD>-
0359 2F5D08   1DDD08  1768          ADDC  SDH,L8                    SD - 86          -<CD>-
035A 20835D   12035D  1769          BCY   TDSNODEF             GO IF SD>=0; DEFECT DOWN FLD -<CD>-
035B 2E5F80   19DF80  1770          ORI   FFLG,DEFCNT          SET DEFECT IN COUNT FLAG -<CD>-
035C 000337   000337  1771          B     TDSZSD               GO ZERO SD AND STORE SD/FLAG -<CD>-
035D 0EDE2E   0BDE2E  1772 TDSNODEF ADDI  SDL,46               ADJUST SD FOR         -<CD>-
035E 2F5D10   1DDD10  1773          ADDC  SDH,ZER                   NEXT COUNT FIELD -<CD>-
035F 0F9DD0   0EDDD0  1774          EORU  ZER,ZER              RETURN TO CALLING ROUTINE -<CD>-
                      1775          END COPY-MEMBER TDS
                      1776      COPY      TDX
                      1777 ************************************
                      1778 *  WAIT FOR INDEX SUBROUTINE
                      1779 ************************************
                      1780 *
0360 2A07E0   1887E0  1781 TDXWADEX LBI   L7,-32                INITIALIZE TIMER
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0361 258567   167567  1782 TDXWAIT  TIBON INDEX,FTI,TDXRETUN GO IF INDEX DETECTED
0362 0EC801   0BC801  1783          ADDI  L8,1               INCREMENT
0363 0F4710   0DC710  1784          ADDC  L7,ZER                  TIMER
0364 028361   0A0361  1785          BNC   TDXWAIT            GO TO CONTINUE WAITING
0365 2A0404   188404  1786          LBI   L4,X'04'           SENSE BYTE 18=TIMEOUT WAITING INDEX
0366 200707   100707  1787          B     TEFNRERR           GO POST UPGM DETECTED ERROR
0367 2E2DFE   18EDFE  1788 TDXRETUN ANDI  FTR,FF-ALLOWIDX     RESET INDEX LATCH
0368 2A0801   188801  1789          LBI   L8,ALLOWIDX         SET MASK
0369 2E11EF   18D1EF  1790          ANDI  CEB1,FF-PADTOIDX     RESET PADDING MARK
036A 02036A   08036A  1791          NOP   *                  DELAY
036B 2F6DC8   1DEDC8  1792          ORU   FTR,L8             SET ALLOW INDEX AND RETURN
                      1793 *
                      1794 *
                      1795 *   PREPARE TO DO A SINGLE CYLINDER SEEK
                      1796 *
036C 201580   101580  1797 TDXCYLSK BU    TRDOPDWN           DO OPERATE DOWN
036D 2E09FB   18C9FB  1798          ANDI  GEN1,FF-SETRWON    RESET R/W TAG UP MARK
036E 264F76   194F76  1799          TBOFF 1,PAH,TDXNEOC      GO IF CYL 256 OFF -- NOT END OF CYL
036F 0C8E5D   02CE5D  1800          TEORI PAC,349-256        TEST END OF PACK (ON CE CLY)
0370 024373   090373  1801          BZ    TDXL800            GO IF CYL ADDR = 349
0371 2C8E5C   12CE5C  1802          TEORI PAC,348-256        TEST END OF PACK
0372 204376   110376  1803          BNZ   TDXNEOC            GO IF CYL ADDR NOT EQUAL 348
0373 0A0800   088800  1804 TDXL800  LBI   L8,X'00'           FORMAT 0 MSG 0
0374 0A0712   088712  1805 TDXL712  LBI   L7,X'12'           POST END OF CYLINDER MARK
0375 201908   101908  1806          B     TSNNORM            GO TO ERROR ROUTINE
0376 08060F   0C860F  1807 TDXNEOC  MV    L6,PAH             MOVE PAH TO L6
0377 28050E   1C850E  1808          MV    L5,PAC             MOVE PAC TO L5
0378 2E0640   18C640  1809          ANDI  L6,X'40'           SAVE CYL 256 ONLY
0379 2EC501   18C501  1810          ADDI  L5,1               INCR CYL ADDR
037A 02037C   0A037C  1811          BNC   *+2                GO IF NO CARRY
037B 0E4640   09C640  1812          ORI   L6,X'40'           TURN ON CYL 256 BIT
037C 001704   001704  1813          B     TSKHIDSK           GO DO HIDDEN SEEK
                      1814          MBLOK
037D 20037D   10037D  1815+         B     *                  UNUSED  ::::::::::::
037E 20037E   10037E  1816+         B     *                  UNUSED  ::::::::::::
037F 00037F   00037F  1817+         B     *                  UNUSED  ::::::::::::
0400                  1818+         DS    <0>8
                      1819 ************************************************
                      1820 *    RETURN HERE AFTER SUCCESSFUL HIDDEN SEEK
                      1821 ************************************************
                      1822 *
0400 2ED801   18D801  1823 TDXSKCPL ADDI  HEAD,1               INCREMENT HEAD ADDR
0401 0CD8F4   03D8F4  1824          TADDI HEAD,-12             CHECK FOR CYL BOUNDARY
0402 204406   110406  1825          BNZ   TDXLT12              GO IF HEAD NOT EQUAL TO 12
0403 2A1800   189800  1826          LBI   HEAD,0               RESET HEAD BYTE
0404 2ED701   18D701  1827          ADDI  CLO,1                INCREMENT
0405 0F5610   0DD610  1828          ADDC  CHI,ZER                  CYL HIGH AND LOW
0406 200780   100780  1829 TDXLT12  BU    TEFSETRW           GO SET RD/WR TAG
0407 2014D4   1014D4  1830          BU    TRDRWEND           WAIT FOR RD/WR DONE
0408 2E13F3   18D3F3  1831          ANDI  MSC1,FF-IDXP1-IDXP2 RESET INDEX PASSED MARKS
0409 200425   100425  1832          B     TDXRDG1            GO XMIT RD HA OP
                      1833 *
                      1834 ************************************************
                      1835 *  I N D E X   P R O C E S S I N G   R O U T I N E
                      1836 ************************************************
                      1837 *
040A 2E2DFE   18EDFE  1838 TDXINDEX ANDI  FTR,FF-ALLOWIDX     RESET INDEX LATCH
0408 280235   1C8235  1839          MV    L2,FTI             COPY FILE TAG IN
040C 22040C   18040C  1840          NOP   *                  DELAY,DO NOT DELETE
040D 2E11EF   18D1EF  1841          ANDI  CEB1,FF-PADTOIDX     RESET PADDING MARK
040E 0E6D01   09ED01  1842          ORI   FTR,ALLOWIDX       TURN ON ALLOW INDEX
040F 265231   195231  1843          TIBOF SRCH,CEB2,TDXNTSCH GO IF NOT SEARCHING
0410 0C1207   00D207  1844          TANDI CEB2,X'07'         TEST TRACK ORIENTATION
0411 024433   090433  1845          BZ    TDXFMTWR           GO IF HA OP
0412 0E2F40   08EF40  1846 TDXRESP  ANDI  SCN,X'40'          RESET FILE XFER CONTROLS
0413 20099A   10099A  1847          BU    TEFRESP            RESPONSE TO FILE
0414 240D17   104D17  1848          TBON  0,RBYT,*+3         GO IF IGNORE CNT FLD DATA CHK MARK ON
0415 0A0724   088724  1849          LBI   L7,CNTCNTR         GET COUNT COUNTER MARK
0416 240790   104790  1850          SINC  ZER,L7,0           SET COUNT COUNTER MARK OFF
0417 271318   1C5318  1851          TIBOF IDXP2,MSC1,TDXIDX1 GO IF NOT IDX PASSED TWICE
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                FA01    3340 MICROPROGRAM---------M12
          EC=827848     PN=4247622    BUS=00
LOC.  OBJECT CODE       STM       SOURCE STATEMENT                                  I
0418 040D1A   004D1A  1852 TDXIDXP2 TBON  0,RBYT,*+2          GO IF IGNORE DATA CHECK MARK ON
0419 200820   100820  1853          B     TEFNRF              GO POST NO RECORD FOUND
041A 2E13F3   18D3F3  1854          ANDI  MSC1,FF-IDXP1-IDXP2 RST INDEX MARKS
041B 0ED304   0BD304  1855 TDXIDX1  ADDI  MSC1,IDXP1         INCR INDEX PASSED COUNT
041C 0A2684   08A684  1856          LBI   FTO,RDSTATUS        RD MOD STATUS TAG
041D 001584   001584  1857          BU    TRDNOFBI            TAG SUBRTN
041E 05E225   076225  1858          TBON  7,FBI,TDXACT        GO IF ACTIVE TRACK
041F 0E8F01   0ACF01  1859 TDXFLPHD EORI  PAH,1                FLIP HAR  ADDRESS
0420 0E9801   0AD801  1860          EORI  HEAD,1              FLIP HEAD ADDRESS
0421 082E0F   0CAE0F  1861 TDXSTHAR MV    FBO,PAH             LOAD HAR IN FBO
0422 0E2E3F   08EE3F  1862          ANDI  FBO,X'3F'           MASK OFF CAR 256 BIT
0423 0A268B   08A68B  1863          LBI   FTO,SETHAR          XMIT HAR TAG
0424 001584   001584  1864          BU    TRDNOFBI            TAG SUBRTN
0425                  1865 TDXRDG1  EQU   *                   READ G1 ENTRY
0425 0E2F40   08EF40  1866 TDXACT   ANDI  SCN,X'40'           RESET FILE XFER CONTROLS
0426 2E2701   18E701  1867          ANDI  FHF,ENDFILEX        RESET END OF FILE XFER
0427 2E33FB   18F3FB  1868          ANDI  DXC,FF-ALOWFILE     RESET ALLOW DIFF CNTR FILE
0428 2A260E   18A60E  1869          LBI   FTO,READOP          SET READ OP TAG
0429 0A2E49   08AE49  1870          LBI   FBO,RDG1+9          RD G1 TAG MODIFIER
042A 088520   028520  1871          SABI  INDEXF1,IDXDDCF     SET PGM POINTER TO DDCF
042B 288720   128720  1872          SABI  INDEXF2,IDXDDCF     SET PGM POINTER TO DDCF
042C 28D14A   13914A  1873          SZI   ZLSFC,ZLSRFILE      SET ZLS TO READ FROM FILE
042D 08A600   02A600  1874          SADI  DISPFC,D(DDCFORG)   SET DISPLACEMENT
042E 2E12F8   18D2F8  1875          ANDI  CEB2,X'F8'          SET TRK ORIENTATION TO END OF HA
042F 2A0708   188708  1876          LBI   L7,8                SET UP FILE XFER COUNT
0430 001452   001452  1877          B     TRD11MC             GO SET 11 MSEC TIMER
                      1878 *
                      1879 *    INDEX PROCESSING AND NOT SEARCHING
                      1880 *
0431 0C1207   00D207  1881 TDXNTSCH TANDI CEB2,X'07'          TEST TRACK ORIENTATION
0432 004438   010438  1882          BNZ   TDXNHAOP            GO IF NOT HA OP
0433 271335   1C5335  1883 TDXFMTWR TIBOF IDXP2,MSC1,TDXIDXOK GO IF NOT INDEX PASSED TWICE
0434 20072A   10072A  1884          B     TEFNOREP            POST NO RESPONSE ON HA OP
0435 0A04A0   0884A0  1885 TDXIDXOK LBI   L4,-96              RE-INITIALIZE TIMER AGAIN
0436 0ED304   0BD304  1886          ADDI  MSC1,IDXP1          INCREMENT INDEX PASSED COUNT
0437 20071C   10071C  1887          B     TEFRETRY            GO WAIT FOR SYNC IN AGAIN
0438 0EEF40   08EF40  1888 TDXNHAOP ANDI  SCN,X'40'           RESET FILE XFER CONTROL
0439 26B53B   1A753B  1889          TBOFF 2,FTI,*+2           SKIP IF NOT CHECK END
043A 00158D   00158D  1890          BU    TRDRDFBI            GATE FIO TO FBI
043B 0B0322   0C8322  1891          MV    L3,FBI              COPY FILE BUS IN
043C 20099A   10099A  1892          BU    TEFRESP             RESPONSE TO FILE
043D 06923F   0A523F  1893          TIBOF WRITE,CEB2,TDXNTWRT GO IF NOT WRITE COMMAND
043E 25E640   176640  1894          TBON  7,FTO,TDXOPC        GO IF ACTUALLY WRITING
043F 070254   0C4254  1895 TDXNTWRT TIBOF NORMEND,L2,TDXINCOP GO IF NO NORMEND (OP INCOMPLETE)
0440 25524A   15524A  1896 TDXOPC   TBON  5,CEB2,TDXINVTK     GO POST
0441 07924A   0E524A  1897          TBOFF 6,CEB2,TDXINVTK       INVALID TRK
0442 27024A   1F524A  1898          TBOFF 7,CEB2,TDXINVTK         IF NOT DATA FIELD OP
0443 05024B   04424B  1899          TIBON NORMEND,L2,TDXNEOK  GO IF OP COMPLETED ON DATA FIELD
0444 06824A   0A424A  1900          TIBOF CHKEND,L2,TDXINVTK  GO IF NO CHECK END (OP CANCELLED)
0445 064347   094347  1901          TIBOF DATAOVN,L3,*+2      GO IF NOT SYNC OUT ERROR
0446 000C0D   000C0D  1902          B     TERL814             GO TO POST SYNC OUT ERROR
0447 24034A   10434A  1903          TIBON CMDOVN,L3,TDXINVTK  GO IF CMD OVERRUN
0448 24C34A   13434A  1904          TIBON TRKOVN,L3,TDXINVTK  GO IF TRACK OVERRUN
0449 200C0F   100C0F  1905          B     TERNSYER            GO TO CHECK END ANALYSIS
044A 200870   100870  1906 TDXINVTK B     TEFINVTK            GO POST INVALID TRACK FORMAT ERROR
                      1907 *
044B 25274D   14674D  1908 TDXNEOK  TIBON ENDTRAP,FHF,*+2     GO IF END OF TRAP COUNT ON
044C 000748   000748  1909          B     TEFL821             GO POST FORMAT 2 ERROR
044D 27E74A   1F674A  1910          TIBOF ENDFILEX,FHF,TDXINVTK  GO IF NOT END OF FILE XFER
044E 2E2701   18E701  1911          ANDI  FHF,ENDFILEX        RESET END OF FILE XFER
044F 062B51   086B51  1912          TIBOF CSOVRUN,HES,*+2     GO IF NOT CYCLE STEAL OVERRUN
0450 000750   000750  1913          B     TEFL80C             GO POST CYCLE STEAL OVERRUN MSG
0451 0F2F40   08EF40  1914          ANDI  SCN,X'40'           RESET FILE XFER CONTROLS
0452 27675A   1D675A  1915          TIBOF SCNSAT,FHF,TDXSCNCU GO CONTINUE IF NOT SCAN SATISFIED
0453 000951   000951  1916 TDXOPDON B     TENSTART            GO TO END PROCEDURE
                      1917 *
0454 068258   0A4258  1918 TDXINCOP TIBOF CHKEND,L2,TDXNOP     GO IF NO CHECK END
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LOC.  OBJECT CODE       STM       SOURCE STATEMENT
0455 0C0310   00C310  1919          TANDI L3,X'10'            GO IF NOT
0456 224458   190458  1920          BZ    TDXNOP                DATA CHECK
0457 000C04   000C04  1921          B     TERCEANZ            GO TO CHECK END ANALYSIS
                      1922 *
                      1923 *   OP CANCELLED BECAUSE OF INDEX
                      1924 *
0458 079258   0E5258  1925 TDXNOP   TBOFF 6,CEB2,TDXCNTOP     GO IF COUNT FIELD OP
0459 07EF4A   0F6F4A  1926          TIBOF NFILEXFR,SCN,TDXINVTK  GO IF NOT CLOCKING
045A 2ED9FF   1BD9FF  1927 TDXSCNCU ADDI  REC,FF              DECREMENT REC NUMBER
045B 2C110F   10D10F  1928 TDXCNTOP TANDI CEB1,X'0F'          TEST FOR CMD DONE
045C 20045F   11045F  1929          BNZ   TDXGOON             GO IF NOT
045D 269353   1A5353  1930          TIBOF MUREC,MSC1,TDXOPDON GO IF NOT MULTIPLE RECORD COMMAND
045E 06DC53   0B5C53  1931          TBOFF 3,NREC,TDXOPDON     GO IF NO MORE RECORD TO PROCESS
045F 2E5103   19D103  1932 TDXGOON  ORI   CEB1,PROCKEY+PROCDAT TURN ON PROCESS FIELD MARKS
0460 245362   115362  1933          TIBON MUTRK,MSC1,*+2      GO IF MULTI TRACK OP
0461 0E5104   09D104  1934          ORI   CEB1,PROCNT         TURN ON PROCESS CNT MARK
0462 05CF64   074F64  1935          TBON  7,PAH,TDXODDTK      GO IF ON ODD TRACK
0463 20041F   10041F  1936          B     TDXFLPHD            GO TO SWITCH HEAD AND READ G1
                      1937 *
                      1938 *
0464 265318   195318  1939 TDXODDTK TIBOF MUTRK,MSC1,TDXIDXP2 GO IF NOT MULTI TRK OP (NO REC END)
0465 079F69   0E5F69  1940          TIBOF DEFTRK,FFLG,TDXNTDEF GO IF NOT DEFECTIVE TRACK
0466 2A0B0D   188B0D  1941 TDXDEFTK LBI   L8,X'0D'            PRESET DEFECTIVE TRACK ERROR MSG
0467 2A0746   188746  1942 TDXL746  LBI   L7,X'46'            POST TRACK CONDITION CHECK
0468 201908   101908  1943          B     TSNNORM             GO TO ERROR ROUTINE
0469 2A080E   1880E   1944 TDXNTDEF LBI   L8,X'0E'            PRESET ALTERNATE TRACK ERROR MSG
046A 2A1901   189901  1945          LBI   REC,1               REINITIALIZE RECORD NUMBER TO 1
046B 2B040F   1C840F  1946          MV    L4,PAH              MOVE HEAD ADDRESS TO WORK REG
046C 05DF7B   075F7B  1947          TIBON ALTTRK,FFLG,TDXALTRK GO IF ALTERNATE TRACK
046D 2E5250   19D250  1948          ORI   CEB2,X'50'          TURN ON SEARCH MARK AGAIN
046E 2E043F   18C43F  1949          ANDI  L4,X'3F'            RETAIN HEAD ADDR ONLY
046F 2CC4E9   13C4E9  1950          TADDI L4,-23              CHECK FOR CYLINDER BOUNDARY
0470 22436C   19036C  1951          BZ    TDXCYLSK            GO DO HIDDEN SEEK IF YES
0471 275474   1D5474  1952          TIBOF SIZE12,MSC2,TDXNT12 GO IF NOT 12MB
0472 2CC4FD   13C4FD  1953          TADDI L4,-3               CHECK FOR CYLINDER BOUNDARY
0473 22436C   19036C  1954          BZ    TDXCYLSK            GO DO HIDDEN SEEK IF YES
0474 2ED801   1BD801  1955 TDXNT12  ADDI  HEAD,1              INCREMENT HEAD ADDRESS
0475 0CC4F5   03C4F5  1956          TADDI L4,-11              CHECK FOR LOGICAL CYL BOUNDARY
0476 004479   010479  1957          BNZ   TDXSKP1             GO IF NOT
0477 2A1800   189800  1958          LBI   HEAD,0              ZERO HEAD
0478 0E5701   09D701  1959          ORI   CLO,1               UPDATE CYLINDER LOW
0479 2ECF01   18CF01  1960 TDXSKP1  ADDI  PAH,1               INCREMENT PAH
047A 000421   000421  1961          B     TDXSTHAR            GO TO SET HAR
047B 000D63   000D63  1962 TDXALTRK B     TERALTRK            GO TO UPDATE CCHH TO NEXT GOOD TRK
                      1963          MBLOK
047C 20047C   10047C  1964+         B     *                   UNUSED  ::::::::::::
047D 00047D   00047D  1965+         B     *                   UNUSED  ::::::::::::
047E 00047E   00047E  1966+         B     *                   UNUSED  ::::::::::::
047F 20047F   10047F  1967+         B     *                   UNUSED  ::::::::::::
0500                  1968+         DS    <0>B
                      1969          END COPY-MEMBER TDX
0500                  1970      ORG       X'0500'
                      1971      COPY      STORAGE
                      1972 ****************************************
                      1973 *      DATA STORAGE BLOCKS
                      1974 ****************************************
                      1975 *
0500                  1976          ORG   (*+255)/256*256
0500                  1977 DDCFORG  EQU   *
0500 00               1978 DDCFORGL DC    8X'00'              DDCF LEFT HALF
                      1979 *
0508 00               1980 DSDISP1  DC    2X'00'              212+(KL+75)+DL
050A 00               1981 DSDISP2  DC    2X'00'              SHORT=139; LONG=126+KL
050C 00               1982 DSDISP3  DC    2X'00'              SHORT=139; LONG=126+DL
050E 00               1983 TRKCNTR  DC    2X'00'              TRACK CAPACITY COUNTER
0510 00               1984 RECLNG   DC    2X'00'              RECORD LENGTH CONSTANT
0512 00               1985 DDDRORG  DC    2X'00'              ORIGINAL DDDR VALUE
0514 00               1986 DDCRORG  DC    2X'00'              ORIGINAL DDCR VALUE
0516 00               1987 BYTEREAD DC    2X'00'              TOTAL BYTES READOUNTER
0518 00               1988 TSKPA    DC    2X'00'              NEW PHY ADDRESS FOR SEEK
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

051A 00                1989 SDFORHA  DC    2X'00'      SKIP DISP FOR WRITE HA
051C 00                1990 SCANSTOR DC    2X'00'      SAVE AREA FOR SCAN OPS
051E 00                1991 UCWPTR   DC    X'00'       ACTIVE UCW POINTER
                       1992 *
051F 00                1993 SKMARK1  DC    X'00'       SEEK IN PROGRESS/SEEK INCOMPLETE
0520 00                1994 SKMARK2  DC    X'00'       SEEK BUSY JUST GOT RESET (4-7)
0521 00                1995 SVPOPT   DC    X'00'       SVP REQUEST OPTION BYTE
                       1996 *
0522 00                1997 SBFLAGS  DC    2X'00'      SEEK BUSY FLAGS & TIMER
                       1998 *
0524 00                1999 CNTCNTR  DC    X'00'       COUNT FIELD COUNTER FOR RDCKD CMD
                       2000 *
0525 00                2001         DC    21X'00'     **********UNUSED**********
                       2002 *
053A 00                2003 EFSENSEL DC    X'00'       EXTENDED FUNCTIONAL SENSE LEFT
                       2004 *                               (BITS 0-3 ARE DM ATTN PENDING)
                       2005 *
053B 00                2006 CSZEROL  DC    X'00'       ONE BYTE OF ZERO FOR DATA FIELD
                       2007 *
053C 00                2008 D1SENSE  DC    24X'00'     DRIVE 1 -- SENSE BYTES
0554 00                2009 D1CURPA  DC    2X'00'      DRIVE 1 -- CURRENT PA
0556 00                2010 D1OLDPA  DC    2X'00'      DRIVE 1 -- OLD PA
0558 00                2011 D1RDCNTR DC    4X'00'      DRIVE 1 -- READ USAGE COUNTER
055C 00                2012 D1SKCNTR DC    2X'00'      DRIVE 1 -- SEEK USAGE COUNTER
                       2013 *
055E 00                2014 D2SENSE  DC    24X'00'     DRIVE 2 -- SENSE BYTES
0576 00                2015 D2CURPA  DC    2X'00'      DRIVE 2 -- CURRENT PA
0578 00                2016 D2OLDPA  DC    2X'00'      DRIVE 2 -- OLD PA
057A 00                2017 D2RDCNTR DC    4X'00'      DRIVE 2 -- READ USAGE COUNTER
057E 00                2018 D2SKCNTR DC    2X'00'      DRIVE 2 -- SEEK USAGE COUNTER
                       2019 *
0580 00                2020 DDCFORGR DC    8X'00'      DDCF RIGHT HALF
                       2021 *
0588 00                2022 ORGREC   DC    X'00'       ORIGINAL REC OF DDCF FOR RDDGN CMD
                       2023 *
0589 00                2024 CSTEMP1  DC    24X'00'     **********UNUSED**********
05A1 00                2025         DC    25X'00'     **********UNUSED**********
                       2026 *
05BA 00                2027 EFSENSER DC    X'00'       EXTENDED FUNCTIONAL SENSE RIGHT
                       2028 *
05BB 00                2029 CSZEROR  DC    X'00'       ONE BYTE OF ZERO FOR DATA FIELD
                       2030 *
05BC 00                2031 D3SENSE  DC    24X'00'     DRIVE 3 -- SENSE BYTES
05D4 00                2032 D3CURPA  DC    2X'00'      DRIVE 3 -- CURRENT PA
05D6 00                2033 D3OLDPA  DC    2X'00'      DRIVE 3 -- OLD PA
05D8 00                2034 D3RDCNTR DC    4X'00'      DRIVE 3 -- READ USAGE COUNTER
05DC 00                2035 D3SKCNTR DC    2X'00'      DRIVE 3 -- SEEK USAGE COUNTER
                       2036 *
05DE 00                2037 D4SENSE  DC    24X'00'     DRIVE 4 -- SENSE BYTES
05F6 00                2038 D4CURPA  DC    2X'00'      DRIVE 4 -- CURRENT PA
05F8 00                2039 D4OLDPA  DC    2X'00'      DRIVE 4 -- OLD PA
05FA 00                2040 D4RDCNTR DC    4X'00'      DRIVE 4 -- READ USAGE COUNTER
05FE 00                2041 D4SKCNTR DC    2X'00'      DRIVE 4 -- SEEK USAGE COUNTER
                       2042 *
                       2043 *
                       2044 *
0600                   2045         DS    <0>8
0600 0000000000000000  2046 DDDFORG  DC    32X'00000000000000000000000000000000' DDDF BUFFER (256 BYTES)
0680                   2047 DDDFORGR EQU   DDDFORG+X'80'
                       2048 *
                       2049         END COPY-MEMBER STORAGE
                       2050      COPY    TEF
                       2051 ************************************************
                       2052 *  THIS SUBROUTINE RAISES TAG GATE; WAITS FOR
                       2053 *       TAG VALID AND DROPS TAG GATE
                       2054 ************************************************
                       2055 *
0700 2A2685  18A685    2056 TEFSETRW LBI   FTO,SETRDWR   LOAD FTO WITH SET RW TAG
0701 2E4580  19E580    2057 TEFTGVAL ORI   FTG,TAGATE    RAISE TAG GATE
0702 2A08F8  1E88F8    2058         LBI   L8,-5          SET TIMER
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0703 24750A  11750A    2059 TEFWAIT1 TIBON TAGVALID,FTI,TEFDRPTG GO IF TAG VALID ON
0704 0EC801  0BC801    2060         ADDI  L8,1              INCR TIMER
0705 028703  0A0703    2061         BNC   TEFWAIT1         GO IF NO TIME OUT
0706 2A0401  188401    2062 TEFL401  LBI   L4,X'01'        SET SENSE BYTE 18
0707 0A0812  088812    2063 TEFNRERR LBI   L8,X'12'        SET UPGM DETECTED ERROR
0708 0A0703  088703    2064 TEFL703  LBI   L7,X'03'        POST EQUIP CHECK
0709 201908  101908    2065         B     TSNNORM          GO TO ERROR ROUTINE
070A 0E257F  08E57F    2066 TEFDRPTG ANDI  FTG,FF-TAGATE   DROP TAG GATE
070B 0F88C8  0EC8C8    2067         EORU  L8,L8            RETURN
                       2068 *
                       2069 ************************************************
                       2070 *  THIS ROUTINE RAISES TAG GATE FOR RD/WR OP
                       2071 *       AND WAITS FOR END OF FIELD
                       2072 ************************************************
                       2073 *
070C 0E0BF7  08CBF7    2074 TEFWAIT  ANDI  STAT,FF-NOOP   RESET NOP STATUS
070D 000781  000781    2075         BU    TEFTGVAL         TAG SUBROUTINE
                       2076 *
                       2077 *    START TO WAIT FOR FIRST SYNC IN
                       2078 *
070E 07E61A  0F661A    2079         TBOFF 7,FTO,TEFRSTAT   GO IF NOT WRITING
070F 2E6F02  19EF02    2080         ORI   SCN,TOFILE       TURN ON WRITE TO FILE CONTROL
0710 0A2E19  08AE19    2081         LBI   FBO,X'19'        LOAD SYNC BYTE
0711 2EA510  1AE510    2082         EORI  FTG,X'10'        GATE FILE BUS IN TO FI
0712 2EA510  1AE510    2083         EORI  FTG,X'10'        RESET GATE
0713 0B2200  0CA200    2084         MV    FBI,DUMMY        GATE FI TO FBI
0714 07731A  0D731A    2085         TIBOF ALOWFILE,DXC,TEFRSTAT  GO IF NOT USING DIFF CNTR
0715 04DC1A  035C1A    2086         TBON  3,NREC,TEFRSTAT  GO IF NOT LAST REC
0716 25521A  15521A    2087         TBON  5,CEB2,TEFRSTAT  GO IF NOT
0717 05D219  075219    2088         TBON  7,CEB2,*+2           END OF DATA
0718 27141A  1C541A    2089         TIBOF DLO,MSC2,TEFRSTAT  GO IF NOT LAST REC
0719 2E6F10  19EF10    2090         ORI   SCN,LASTREC      TURN ON LAST RECORD MARK
071A 2E6F08  19EF08    2091 TEFRSTAT ORI   SCN,ALWFXFR     SET ALLOW FILE XFER TO START OP
071B 2B3607  1CB607    2092         MV    FCT,L7           LOAD FILE COUNTER
071C 0B0704  0C8704    2093 TEFRETRY MV    L7,L4            LOAD TIMER
071D 25752C  15752C    2094 TEFSYNLP TIBON SYNCIN,FTI,TEFSYFND GO IF SYNC FOUND
071E 078520  0E7520    2095         TIBOF INDEX,FTI,*+2      GO IF NO INDEX
071F 00040A  00040A    2096 TEFIDXFD B     TDXINDEX         GO TO INDEX PROCESSING
0720 25752C  15752C    2097         TIBON SYNCIN,FTI,TEFSYFND GO IF SYNC FOUND
0721 268526  1A7526    2098         TIBOF CHKEND,FTI,TEFNCE  GO IF NO CHECK END
0722 220722  180722    2099 TEFCE    NOP   *              DELAY
0723 020723  080723    2100         NOP   *              DELAY
0724 25851F  16751F    2101         TIBON INDEX,FTI,TEFIDXFD GO IF CHECK END AND ALSO INDEX
0725 200C00  100C00    2102         B     TERCKEND       NO INDEX--GO ANALY CHECK END
0726 25752C  15752C    2103 TEFNCE   TIBON SYNCIN,FTI,TEFSYFND GO IF SYNC FOUND
0727 2EC806  1BC806    2104         ADDI  L8,6           INCREMENT
0728 0F4710  0DC710    2105         ADDC  L7,ZER                 TIMER
0729 028710  0A071D    2106         BNC   TEFSYNLP       GO IF NOT TIME OUT
072A 2A0402  188402    2107 TEFNOREP LBI   L4,X'02'       SET SENSE BYTE 18 TO NO NE/CE ON R/W
072B 200707  100707    2108         B     TEFNRERR       GO SET NO RESPONSE ERROR
                       2109 *
                       2110 *    START TO OFFLOAD SD, PA AND FLAG IF HA OR CNT OP
                       2111 *
072C 2A0000  188000    2112 TEFSYFND LBI   L0,X'00'       SET UP DDCF POINTERS TO SD HIGH
072D 2A0180  188180    2113         LBI   L1,X'80'               ''          TO SD LOW
072E 2A020E  18820E    2114         LBI   L2,D(TRKCNTR)    INIT L2 TO DISPL OF TRK CNTR -<CD>-
072F 0A079C  08879C    2115         LBI   L7,-100          LOAD END OF XFER TIMER
0730 25E638  176638    2116         TBON  7,FTO,TEFLASTB   GO WAIT FOR LAST
0731 259238  165238    2117         TBON  6,CEB2,TEFLASTB     BYTE IF WRITING OR NOT HA/CNT OP
0732 000D77  000D77    2118         B     TERGETSD         GO TO FETCH SDH AND SDL
0733 0440C4  0140C4    2119 TEFPAC   LINC  L4,L0,1         FETCH PAC
0734 020734  080734    2120         NOP   *              DELAY
0735 0441C5  0141C5    2121         LINC  L5,L1,1        FETCH PAH
0736 220736  180736    2122         NOP   *              DELAY
0737 0440DF  0140DF    2123         LINC  FFLG,L0,1      FETCH FLAG BYTE
                       2124 *
                       2125 *    START TO WAIT FOR LAST BYTE FROM FILE
                       2126 *
0738 05E743  076743    2127 TEFLASTB TIBON ENDFILEX,FHF,TEFNECE  GO IF END OF FILE XFER
0739 25851F  16751F    2128         TIBON INDEX,FTI,TEFIDXFD    GO IF INDEX FOUND
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

073A 05E743   076743  2129          TIBON ENDFILEX,FHF,TEFNECE  GO IF END OF FILE XFER
073B 248522   127522  2130          TIBON CHKEND,FTI,TEFCE      GO IF CHECK END
073C 05E743   076743  2131          TIBON ENDFILEX,FHF,TEFNECE  GO IF END OF FILE XFER
073D 273540   1C7540  2132          TIBOF NORMEND,FTI,*+3       GO IF NO NORMAL END
073E 0A0822   088822  2133          LBI   L8,X'22'              POST ERROR - NO END OF FILE XFER
073F 201E44   101E44  2134          B     TWRFMT2E              GO POST EQUIP CHECK
0740 0EC701   0BC701  2135          ADDI  L7,1                  INCR TIMER
0741 228738   1A0738  2136          BNC   TEFLASTB              GO IF NO TIME OUT
0742 20072A   10072A  2137          B     TEFNOREP              GO POST NO RESPONSE ERROR
                      2138 *
                      2139 *    START TO WAIT FOR NORMAL END OR CHECK END
                      2140 *
0743 053549   047549  2141 TEFNECE  TIBON NORMEND,FTI,TEFXFEND GO IF NORMAL END
0744 25851F   16751F  2142          TIBON INDEX,FTI,TEFIDXFD  GO IF INDEX FOUND
0745 248522   127522  2143          TIBON CHKEND,FTI,TEFCE    GO IF CHECK END
0746 0EC701   0BC701  2144          ADDI  L7,1                INCR TIMER
0747 228743   1A0743  2145          BNC   TEFNECE             GO IF NOT TIME OUT
0748 20072A   10072A  2146          B     TEFNOREP            GO POST NO RESPONSE ERROR
                      2147 *
                      2148 *    COME HERE WHEN DATA XFER COMPLETE
                      2149 *
0749 05EF4D   076F4D  2150 TEFXFEND TBON  7,SCN,TEFFCTOK       GO IF INHIBIT FILE/CS XFER
074A 25274D   14674D  2151          TIBON ENDTRAP,FHF,TEFFCTOK GO IF END OF TRAP COUNT ON
074B 0A0821   088821  2152 TEFL821  LBI   L8,X'21'             POST ERROR - NO END OF TRAP COUNT
074C 201E44   101E44  2153          B     TWRFMT2E              GO POST EQUIP CHECK
074D 20099A   10099A  2154 TEFFCTOK BU    TEFRESP               RESPONSE
074E 2E2701   18E701  2155          ANDI  FHF,ENDFILEX          RESET END OF FILE XFER
074F 062852   086B52  2156          TIBOF CSOVRUN,HES,*+3       GO IF NO DATA OVERRUN
0750 0A080C   08880C  2157 TEFL80C  LBI   L8,X'0C'             POST DATA OVERRUN MSG
0751 200C0A   100C0A  2158          B     TERL705               GO POST OVERRUN BIT
0752 0E2FF1   08EFF1  2159          ANDI  SCN,FF-ALWFXFR-FILEODD-TOFILE     RST FILE XFR HARDWARE
0753 0B0312   0C8312  2160          MV    L3,CEB2               MOVE ORIENTATION CODE
0754 2E0307   18C307  2161          ANDI  L3,X'07'              SAVE TRACK ORIENTATION BITS
0755 2EC349   18C349  2162          ADDI  L3,D(TEFDECOD)        ADD DISPLACEMENT TO BRANCH REG
0756 010903   040903  2163          BR    B(TEFDECOD),L3        DO ORIENTATION BREAK OUT
                      2164 ***********************************************
                      2165 *  THIS ROUTINE HANDLES DISK PROCESSING
                      2166 *       AT THE END OF HOME ADDRESS
                      2167 ***********************************************
                      2168 *
0757 2A020E   18820E  2169 TEFENDHA LBI   L2,X'0E'              POINT L2 TO TRK CAP COUNTER
0758 2002DA   1002DA  2170          BU    TDSRSTCT              GO INITIALIZE TRK CAP COUNTER
0759 25E670   176670  2171          TBON  7,FTO,TEFWRO          GO IF JUST FINISHED WRITING
075A 2F844E   1EC44E  2172          EOR   L4,PAC                COMPARE THE
075B 2F854F   1EC54F  2173          EOR   L5,PAH                    PA BYTES
075C 2D0405   14C405  2174          TADD  L4,L5                 TEST FOR COMPARE
075D 02475F   09075F  2175          BZ    TEFPAOK               GO IF COMPARE
075E 000C3D   000C3D  2176          B     TERPACHK              GO TO POST PA CHECK
075F 079F6A   0E5F6A  2177 TEFPAOK  TIBOF DEFTRK,FFLG,TEFNDEF  GO IF NOT DEFECTIVE TRACK
0760 045262   015262  2178          TIBON SRCH,CEB2,*+2         GO IF SEARCHING
0761 20076B   10076B  2179          B     TEFNOTS               NOT SEARCHING
0762 0C1210   0DD210  2180          TANDI CEB2,X'10'            TEST FOR HEAD SWITCHED
0763 204466   110466  2181          BNZ   TDXDEFTK              GO IF SWITCHED
0764 045167   015167  2182          TIBON FMTWR,CEB1,TEFL80D    GO IF FORMAT WRITE
0765 04D967   035967  2183          TBON  3,REC,*+2             GO IF NOT RECORD ZERO
0766 20077C   10077C  2184          B     TEFCLKRO              GO READ RO COUNT INTO BUFFER
0767 2A090D   18880D  2185 TEFL80D  LBI   L8,X'0D'              FORMAT 0,
0768 0A0706   088706  2186          LBI   L7,X'06'                MESSAGE D
0769 201908   101908  2187          B     TSNNORM                 ERROR
076A 04527C   01527C  2188 TEFNDEF  TIBON SRCH,CEB2,TEFCLKRO  READ RO COUNT IF SEARCH BIT OFF
076B 27117C   1C517C  2189 TEFNOTS  TIBOF PROCRO,CEB1,TEFCLKRO GO IF NOT PROCESS RO CNT
076C 065178   095178  2190          TIBOF FMTWR,CEB1,TEFRDRO  GO IF NOT WRITING
076D 078196   0E4196  2191          SDEC  CHI,L1,2            STORE CHI IN DDCF
076E 044097   014097  2192          SINC  CLO,L0,1            STORE CLO IN DDCF
076F 270098   1C4098  2193          SDEC  HEAD,L0,4           STORE HEAD IN DDCF
0770 2CDE4E   13DE4E  2194 TEFWRO   TADDI SDL,-178            TEST SKIP DISPLACEMENT VALUE
0771 20C776   130776  2195          BCN   TEFSKP1             GO IF SD > 178
0772 24DD76   135D76  2196          TBON  3,SDH,TEFSKP1       GO IF SD INDEED > 178
0773 2A1E00   189E00  2197 TEFSKP3  LBI   SDL,0                ZERO SD
0774 2A1D00   189D00  2198          LBI   SDH,0                     BYTES
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0775 20077A   10077A  2199          B     TEFSKP2               GO STORE SD IN DDCF BUFFER
0776 041F73   005F73  2200 TEFSKP1  TBON  0,FFLG,TEFSKP3       GO IF CNT MOVED
0777 0EDE2D   08DE2D  2201          ADDI  SDL,-211              UPDATE SD TO
0778 00877A   02077A  2202          BCY   TEFSKP2                   MEASURE FROM END
0779 0EDDFF   0BDDFF  2203          ADDI  SDH,-1                        OF RO COUNT FIELD
077A 201D00   101D00  2204 TEFSKP2  B     TWRCOUNT              GO WRITE RO COUNT
077B 2E11F7   18D1F7  2205 TEFRDRO  ANDI  CEB1,FF-PROCRO        TURN OFF PROC RO CNT MARK
077C 20145C   10145C  2206 TEFCLKRO B     TRDCOUNT              GO READ RO CNT INTO CS BUFFER
                      2207          MBLOK
077D 00077D   00077D  2208+         B     *                     UNUSED  ::::::::::::
077E 00077E   00077E  2209+         B     *                     UNUSED  ::::::::::::
077F 20077F   10077F  2210+         B     *                     UNUSED  ::::::::::::
0800                  2211+         DS    <0>B
                      2212 ***********************************************************
                      2213 *  THIS ROUTINE HANDLES DISK PROCESSING AT THE END
                      2214 *       OF RO COUNT OR ANY COUNT FIELD
                      2215 ***********************************************************
                      2216 *
0800 07E604   0F6604  2217 TEFCOUNT TBOFF 7,FTO,TEFNWRCT        GO IF NOT WRITING
0801 25930A   16530A  2218          TIBON ERASE,MSC1,TEFEND     GO IF ERASE
0802 200280   100280  2219          BU    TDSUPTRK              GO UPDATE TRK CAPACITY COUNTER
0803 001D1F   001D1F  2220          B     TWRKEY                GO WRITE KEY FIELD
0804 245235   115235  2221 TEFNWRCT TIBON SRCH,CEB2,TEFSRCH     GO IF SEARCHING
0805 265107   195107  2222          TIBOF FMTWR,CEB1,*+2        GO IF NOT FMT WRITE
0806 24122C   10522C  2223          TIBON READ,CEB2,TEFCKDD     GO IF READ CKD DIAG CMD
0807 2C110F   10D10F  2224          TANDI CEB1,X'0F'            TEST END OF COMMAND
0808 00400B   01080B  2225          BNZ   *+3                   GO IF NOT DONE
0809 259311   165311  2226          TIBON ERASE,MSC1,TEFSPK     GO IF ERASE (SPACE OVER KEY)
080A 000951   000951  2227 TEFEND   B     TENSTART              GO TO END PROCEDURE
080B 255219   155219  2228          TBON  5,CEB2,TEFNTROC       GO IF NOT END OF RO CNT
                      2229 *    END OF RO COUNT FIELD
080C 001365   001365  2230          B     TRDCOMP               GO COMPARE FCCHH EVEN/ODD CNT  -<CD>-
080D 200280   100280  2231 TEFENDRO BU    TDSUPTRK              GO UPDATE TRK CAPACITY COUNTER -<CD>-
080E 061210   085210  2232          TIBOF READ,CEB2,*+2         GO IF NOT READ
080F 265312   195312  2233          TIBOF MUTRK,MSC1,TEFRDK     GO IF NOT RD/VERIFY K-D CMD
0810 06D91E   0B591E  2234          TBOFF 3,REC,TEFRECO         GO IF RECORD 0
0811 20154A   10154A  2235 TEFSPK   B     TRDSPKEY              GO SPACE OVER KEY FIELD
0812 251111   145111  2236 TEFRDK   TIBON PROCRO,CEB1,TEFSPK    GO SPACE KEY IF
0813 055111   055111  2237          TIBON PROCNT,CEB1,TEFSPK        PROCRO OR PROCNT MARK ON
0814 050D17   044D17  2238 TEFRDKS  TBON  4,RBYT,TEFNEEDL       GO IF READ RO-ODD CMD
0815 254D18   154D18  2239          TBON  5,RBYT,*+3            GO IF READ C-K-D CMD OR
0816 078D18   0E4D18  2240          TBOFF 6,RBYT,*+2              READ VERIFY K-D CMD
0817 00099D   00099D  2241 TEFNEEDL BU    TEFGETKD              GO GET KL AND DL
0818 00151D   00151D  2242          B     TRDKEY                GO READ KEY FIELD
                      2243 *     END OF ANY REGULAR COUNT FIELD
0819 26121E   18521E  2244 TEFNTROC TIBOF READ,CEB2,TEFRECO     GO IF NOT READ
081A 265312   195312  2245          TIBOF MUTRK,MSC1,TEFRDK     GO IF NOT RD/VERIFY K-D (MUST BE
                      2246 *                                        RD RO K-D COMMAND)
081B 075F1E   0D5F1E  2247          TIBOF CMFDAT,FFLG,*+3       GO IF NOT COMPRESSED DATA
081C 259914   165914  2248          TBON  6,REC,TEFRDKS         SKIP COMPARE FCCHHR IF RECORD NO
081D 27D914   1F5914  2249          TBOFF 7,REC,TEFRDKS               IS 2ND, 3RD, OR 4TH OF GROUP
081E 2009B1   1009B1  2250 TEFRECO  BU    TEFCMPR               GO COMPARE FCCHHR
081F 024824   090824  2251          BZ    TEFCMPOK              GO IF COMPARE
0820 0A0800   088800  2252 TEFNRF   LBI   L8,X'00'              GO POST
0821 0A0714   088714  2253 TEFL714  LBI   L7,X'14'                    NO RECORD  FOUND
0822 2E09EF   18C9EF  2254          ANDI  GEN1,FF-XFRHACNT      RST XFER HA/CNT MARK
0823 201908   101908  2255          B     TSNNORM
0824 249228   125228  2256 TEFCMPOK TIBON WRITE,CEB2,TEFWKEY   GO IF WRITING
0825 241249   105249  2257          TIBON READ,CEB2,TEFCKVKD    GO IF READ
0826 00099D   00099D  2258 TEFSCAN  BU    TEFGETKD              GO GET  KL AND DL
0827 201652   101652  2259          B     TSCKEY                GO SCAN KEY AND DATA
0828 2009C0   1009C0  2260 TEFWKEY  BU    TEFCMPKD              COMPARE KL AND DL
0829 004820   010820  2261          BNZ   TEFNRF                GO POST NO RECORD FOUND
082A 05C620   074620  2262          TBON  7,L6,TEFNRF               IF KL AND DL MISCOMPARE
0828 001D1F   001D1F  2263 TEFWRK   B     TWRKEY                GO WRITE KEY FIELD
                      2264 *
                      2265 *      THE FOLLOWING HANDLES READ CKD DIAG CMD AFTER ORIENTATION
                      2266 *
082C 0A0184   088184  2267 TEFCKDD  LBI   L1,X'84'              SET CS POINTER TO REC
082D 0501C6   0441C6  2268          LINC  L6,L1,4               GET CURRENT REC NUMBER
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

082E 0681C7  0A41C7  2269          LDEC  L7,L1,6             GET ORIGINAL REC IN DDCF
082F 0F8647  0EC647  2270          EOR   L6,L7               COMPARE
0830 025510  09151D  2271          BZ    TRDKEY              GO READ KEY/DATA IF EQUAL
0831 055211  055211  2272          TBON  5,CEB2,TEFSPK       GO IF NOT END OF RO CNT
0832 2A0005  188005  2273          LBI   L0,X'05'            POINT L0 TO KL
0833 2A0185  188185  2274          LBI   L1,X'85'            POINT L1 TO DL HIGH
0834 20080D  10080D  2275          B     TEFENDRO            GO PROC END OF RO CNT
                     2276 *
                     2277 *     THE FOLLOWING HANDLES SEARCHING  (RECORD ORIENTATION)
                     2278 *
0835 079F39  0E5F39  2279 TEFSRCH  TIBOF DEFTRK,FFLG,TEFEROC GO IF NOT DEF TRACK
0836 04D938  035938  2280          TBON  3,REC,*+2           GO IF NOT RECORD ZERO
0837 275139  1D5139  2281          TIBOF PROCNT,CEB1,*+2     GO IF PROCESS COUNT OFF
0838 200767  100767  2282          B     TEFL80D             GO POST FORMAT 0, MESSAGE D SENSE
0839 255238  155238  2283 TEFEROC  TBON  5,CEB2,*+2          GO IF NOT END OF RO CNT
083A 05CF7F  074F7F  2284          TBON  7,PAH,TEFODTRK      GO IF ODD TRACK
083B 2009B1  1009B1  2285          BU    TEFCMPR             GO COMPARE FCCHHR
083C 02483F  09083F  2286          BZ    TEFRCDFD            GO IF COMPARE
083D 2002B0  1002B0  2287          BU    TDSUPTRK            GO UPDATE TRK CAPACITY COUNTER
083E 20154A  10154A  2288          B     TRDSPKEY            GO SPACE KEY FIELD
083F 069244  0A5244  2289 TEFRCDFD TIBOF WRITE,CEB2,TEFNTWRT GO IF NOT WRITE K-D OR
0840 265344  195344  2290          TIBOF MUTRK,MSC1,TEFNTWRT      REPEAT WRITE K-D
0841 2009C0  1009C0  2291          BU    TEFCMPKD            GO COMPARE KL AND DL
0842 204811  110811  2292          BNZ   TEFSPK              GO TO SPACE OVER K-D FIELDS
0843 25C611  174611  2293          TBON  7,L6,TEFSPK              IF KL AND DL MISCOMPARE
0844 0E9240  0AD240  2294 TEFNTWRT EORI  CEB2,SRCH            TURN OFF SEARCH BIT
0845 2002B0  1002B0  2295          BU    TDSUPTRK            GO CHECK IF NEXT RCD FIT ON TRACK
0846 055111  055111  2296          TIBON PROCNT,CEB1,TEFSPK  GO IF PROCESS NEXT COUNT FIELD
0847 249228  125228  2297          TIBON WRITE,CEB2,TEFWRK   GO IF WRITE
0848 061226  085226  2298          TIBOF READ,CEB2,TEFSCAN   GO IF NOT READ
0849 000814  000814  2299 TEFCKVKD B     TEFRDKS             GO CHECK WHICH READ CMD
                     2300 ************************************************
                     2301 *  THIS ROUTINE HANDLES DISK PROCESSING AT
                     2302 *        THE END OF A DATA FIELD
                     2303 ************************************************
                     2304 *
084A 245253  115253 2305 TEFDATA  TIBON SRCH,CEB2,TEFCLKCT  GO IF SEARCHING
084B 2C110F  10D10F 2306          TANDI CEB1,X'0F'          TEST TO SEE IF CMD IS DONE
084C 22485E  19085E 2307          BZ    TEFCONTU            GO IF YES
084D 045350  015350 2308          TIBON MUTRK,MSC1,*+3      GO IF MULTI TRK TYPE CMDS
084E 065150  095150 2309          TIBOF FMTWR,CEB1,*+2      GO IF NOT FMT WRITE CMD
084F 0ED901  0BD901 2310          ADDI  REC,1               INCREMENT RECORD NUMBER
0850 275153  1D5153 2311          TIBOF PROCNT,CEB1,TEFCLKCT GO READ CNT IF NOT PROC CNT
0851 04516D  01516D 2312          TIBON FMTWR,CEB1,TEFWRCNT GO IF FORMAT WRITE
0852 2E11FB  18D1FB 2313 TEFPDCNT ANDI  CEB1,FF-PROCNT      TURN OFF PROC COUNT MARK
0853 275F5D  1D5F5D 2314 TEFCLKCT TIBOF CMPDAT,FFLG,TEFCTNXT  GO IF NOT COMPRESSED DATA   -<CD>-
0854 0A0184  088184 2315          LBI   L1,X'84'            POINT L1 TO RECORD NUMBER    -<CD>-
0855 2401C6  1041C6 2316          LINC  L6,L1,0             FETCH RECORD NUMBER          -<CD>-
0856 258658  166658 2317          TBON  6,L6,*+2            GO RD COUNT IF               -<CD>-
0857 27C65D  1F465D 2318          TBOFF 7,L6,TEFCTNXT          R/4 IS AN INTEGER         -<CD>-
0858 2EC601  18C601 2319          ADDI  L6,1                INCR RECORD NUMBER           -<CD>-
0859 278186  1E4186 2320          SDEC  L6,L1,2             STORE UPDATED REC NUMBER     -<CD>-
085A 2A0003  188003 2321          LBI   L0,X'03'            L0 POINTS TO CYL LOW;        -<CD>-
                    2322 *                                  L1 POINTS TO CYL HIGH.       -<CD>-
085B 2ED201  18D201 2323          ADDI  CEB2,1              TRK ORIENTATION TO END OF CNT -<CD>-
085C 000800  000800 2324          B     TEFCOUNT            GO PROCESS END OF COUNT      -<CD>-
085D 20145C  10145C 2325 TEFCTNXT B     TRDCOUNT            GO READ COUNT FIELD          -<CD>-
                    2326 *                                                               -<CD>-
085E 059373  065373 2327 TEFCONTU TIBON ERASE,MSC1,TEFWROK   GO IF ERASE
085F 249362  125362 2328          TIBON MUREC,MSC1,*+3      GO IF MULTIPLE RECORD CMD
0860 0A1CFF  089CFF 2329          LBI   NREC,FF             FORCE NREC TO FF
0861 000951  000951 2330 TEFENDPO B     TENSTART            GO TO END PROCEDURE
0862 276766  1D6766 2331          TIBOF SCNSAT,FHF,TEFNOHIT GO IF NO SCAN HIT
0863 07A761  0E6761 2332          TIBOF SCNEQ,FHF,TEFENDPO  GO IF NOT SCAN EQUAL
0864 2E4840  19C840 2333          ORI   STAT,SCANEQUL       POST SCAN EQUAL STATUS
0865 000951  000951 2334          B     TENSTART            GO TO END PROCEDURE
0866 0E2F40  0BEF40 2335 TEFNOHIT ANDI  SCN,X'40'           TURN OFF ALL FILE XFER CONTROLS
0867 2EDCFF  18DCFF 2336          ADDI  NREC,X'FF'          SUBTRACT 1 FROM N
0868 228761  1A0861 2337          BNC   TEFENDPO            GO TO END PROCEDURE IF N=FF
0869 0ED901  0BC901 2338          ADDI  REC,1               INCREMENT RECORD NUMBER
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

086A 2E5103  19D103  2339          ORI   CEB1,X'03'          TURN ON PROC KEY AND PROC DATA MKS
086B 245352  115352  2340          TIBON MUTRK,MSC1,TEFRDCNT GO READ COUNT IF MULTI TRK OP
086C 0E5104  09D104  2341          ORI   CEB1,PROCNT         TURN ON PROC CNT MARK
086D 255577  155577  2342 TEFWRCNT TIBON CMPDAT,FLAG,TEFWCCD GO IF WRITE COMPRESSED C-D     -<CD>-
086E 07D373  0F5373  2343 TEFREGWC TIBOF TRKOFL,MSC1,TEFWROK GO IF NOT TRACK OVERFLOW      -<CD>-
086F 07CF74  0F4F74  2344          TBOFF 7,PAH,TEFWADEX      GO WAIT FOR INDEX IF ON EVEN TRACK
0870 0A0800  088800  2345 TEFINVTK LBI   L8,0                POST INVALID
0871 0A0711  088711  2346 TEFL711  LBI   L7,X'11'                        TRACK FORMAT
0872 201908  101908  2347          B     TSNNORM
0873 201D00  101D00  2348 TEFWROK  B     TWRCOUNT            GO WRITE COUNT FIELD
0874 0003E0  0003E0  2349 TEFWADEX BU    TDXWADEX            GO WAIT FOR INDEX
0875 0E13FE  0BD3FE  2350          ANDI  MSC1,FF-TRKOFL      RESET TRACK OVERFLOW MARK
0876 00045A  00045A  2351          B     TDXSCNCU            GO DO INDEX PROCESSING
                     2352 *
0877 059979  065979  2353 TEFWCCD  TBON  6,REC,*+2            GO WR COUNT IF (R-1)/4       -<CD>-
0878 25D96E  17596E  2354          TBON  7,REC,TEFREGWC             IS AN INTEGER       -<CD>-
0879 0A0184  088184  2355          LBI   L1,X'84'            POINT L1 TO RECORD NUMBER    -<CD>-
087A 270199  1C4199  2356          SDEC  REC,L1,4            STORE UPDATED REC NUMBER     -<CD>-
087B 2A0000  188000  2357          LBI   L0,X'00'            L0 POINTS TO SDH             -<CD>-
                     2358 *                                  L1 POINTS TO SDL             -<CD>-
087C 2E11FB  18D1FB 2359          ANDI  CEB1,FF-PROCNT      TURN OFF PROCESS COUNT MARK  -<CD>-
087D 2ED201  18D201 2360          ADDI  CEB2,1              TRK ORIENTATION TO END OF CNT -<CD>-
087E 000800  000800 2361          B     TEFCOUNT            GO PROCESS END OF COUNT      -<CD>-
                    2362 *
087F 001479  001479 2363 TEFODTRK B     TRDODTRK            GO PROCESS ODD RO COUNT
                    2364          MBLOK
0900                2365+         DS    <0>B
                    2366 ************************************************
                    2367 *  THIS ROUTINE HANDLES DISK PROCESSING AT
                    2368 *       THE END OF A KEY FIELD
                    2369 ************************************************
                    2370 *
0900 059302  065302 2371 TEFKEY   TIBON ERASE,MSC1,TEFSPD    GO IF ERASE
0901 065203  095203 2372          TIBOF SRCH,CEB2,*+2       GO IF NOT SEARCHING
0902 001559  001559 2373 TEFSPD   B     TRDSPDAT            GO TO SPACE OVER DATA FIELD
0903 27E605  1F6605 2374          TBOFF 7,FTO,*+2           GO IF NOT WRITING
0904 201D3F  101D3F 2375          B     TWRDATA             GO WRITE DATA FIELD
0905 259102  165102 2376          TIBON PROCKEY,CEB1,TEFSPD GO IF PROCESS KEY MARK STILL ON
0906 061208  085208 2377          TIBOF READ,CEB2,*+2       GO SCAN DATA IF NOT READ
0907 00153F  00153F 2378          B     TRDDATA             GO READ DATA FIELD
0908 201658  101658 2379          B     TSCDATA             GO SCAN DATA FIELD
                    2380 ************************************************
                    2381 *  THIS ROUTINE HANDLES DISK PROCESSING AT THE END
                    2382 *       OF FIRST SEGMENT OF A SPLIT FIELD
                    2383 ************************************************
                    2384 *
0909 2B061A  1C861A 2385 TEFKEY1  MV    L6,KCNT             COPY KEY LENGTH TO L6
090A 20090C  10090C 2386          B     *+2
                    2387 *
090B 0B061B  0C861B 2388 TEFDATA1 MV    L6,DCNT             COPY DATA LENGTH TO L6
090C 2B071E  1C871E 2389          MV    L7,SDL              COPY FIRST SEGMENT LENGTH TO L7
090D CE87FF  0AC7FF 2390          EORI  L7,FF               INVERT FIRST SEGMENT LENGTH
090E 0FC706  0FC706 2391          ADDI  L7,L6               FORM SECOND SEGMENT LEG
090F 0A0680  0886B0 2392          LBI   L6,WRG4             SET UP WRG4 TAG MODIFIER
0910 2E12FB  18D2FB 2393          ANDI  CEB2,X'FB'          UPDATE ORIENTATION MARK
0911 0E1F1F  0BDF1F 2394          ANDI  FFLG,X'1F'          RESET DEFECT MARKS IN FLAG
0912 2B1E10  1C9E10 2395          MV    SDL,ZER             ZERO SD
0913 27C915  1F4915 2396          TBOFF 7,GEN1,*+2          GO IF FILE ODD XFER SWITCH OFF
0914 2E6F04  19EF04 2397          ORI   SCN,FILEODD         TURN ON FILE ODD TRANSFER
0915 27E617  1F6617 2398          TBOFF 7,FTO,*+2           GO IF READ  OP
0916 001D37  001D37 2399          B     TWRRWCON            GO RAISE TAG GATE
0917 2A0630  188630 2400          LBI   L6,RDG4             SET RDG4 TAG MODIFIER
0918 0E2F0F  0BEF0F 2401          ANDI  SCN,FF-SCNSPLIT     RESET SCAN SPLIT FIELD
0919 201532  101532 2402          B     TROCNTR             GO UPDATE READ USAGE COUNTER
                    2403 ************************************************
                    2404 *  THIS SUBROUTINE RAISES RESPONSE GATE
                    2405 *       AND THEN DROPS IT
                    2406 ************************************************
                    2407 *
091A 2E6508  19E508 2408 TEFRESP  ORI   FTG,RESPONSE        RAISE RESPONSE GATE
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

091B 0E25F7   08E5F7  2409          ANDI  FTG,FF-RESPONSE      DROP RESPONSE GATE
091C 280888   1C8888  2410          MVU   L8,L8                RETURN
                      2411 ************************************************
                      2412 *  THIS SUBROUTINE FETCHES KL AND DL FROM DDCF
                      2413 *       AND PUTS THEM INTO DLS
                      2414 ************************************************
                      2415 *
091D 0E14F6   08D4F6  2416 TEFGETKD ANDI  MSC2,FF-DLO-DL256   RESET DLO AND DL256 MARKS
091E 075F22   0D5F22  2417          TIBOF CMPDAT,FFLG,TEFNTCCD   GO IF NOT COMPRESSED FORMAT
091F 0E5401   09D401  2418          ORI   MSC2,DL256          SET DL 256 MARK
0920 0B1A10   0C9A10  2419          MV    KCNT,ZER            ZERO KL
0921 0B1B90   0C9B90  2420          MVU   DCNT,ZER            ZERO DL LOW AND RETURN
0922 0A0085   088085  2421 TEFNTCCD LBI   L0,X'85'            SET CS POINTER
0923 2400C1   1040C1  2422          LINC  L1,L0,0             FETCH DATA LENGTH HIGH
0924 2A0005   188005  2423          LBI   L0,X'05'            SET CS POINTER
0925 0440DA   0140DA  2424          LINC  KCNT,L0,1           FETCH KEY LENGTH
0926 2480DB   1240DB  2425          LINC  DCNT,L0,2           FETCH DATA LENGTH LOW (L0=08)
0927 0CC1FF   03C1FF  2426          TADDI L1,FF               TEST DL HIGH
0928 22892D   1A092D  2427          BNC   TEFNT256            GO IF DL < 256
0929 004870   010870  2428          BNZ   TEFINVTK            GO POST ERROR IF DL>256
092A 2D1A1B   14DA1B  2429          TADD  KCNT,DCNT           DL HI = 256, CHK KL+DL LOW = 0
092B 004870   010870  2430          BNZ   TEFINVTK            GO POST ERROR IF NOT
092C 2F54C1   1DD4C1  2431 TEFORL1  ORU   MSC2,L1             SET DL256 AND RETURN
092D 2D1A1B   14DA1B  2432 TEFNT256 TADD  KCNT,DCNT           DL HI ¬=256, CHK KL+DL LOW <=256
092E 20C870   130870  2433          BCN   TEFINVTK            GO POST ERROR IF NOT
092F 24DB2C   135B2C  2434          TBON  3,DCNT,TEFORL1      GO IF DL NOT ZERO
0930 0F54C0   0DD4C0  2435          ORU   MSC2,L0             SET DL0   AND RETURN
                      2436 ************************************************
                      2437 *    THE FOLLOWING SUBROUTINE COMPARES FCCHHR
                      2438 ************************************************
                      2439 *
0931 2B051F   1C851F  2440 TEFCMPR  MV    L5,FFLG
0932 0F8555   0EC555  2441          EOR   L5,FLAG             COMPARE FLAG
0933 0E0503   08C503  2442          ANDI  L5,X'03'
0934 2440C6   1140C6  2443          LINC  L6,L0,1             FETCH CYL LOW
0935 2F8657   1EC657  2444          EOR   L6,CLO              COMPARE
0936 2F4546   1DC546  2445          OR    L5,L6
0937 0481C6   0241C6  2446          LINC  L6,L1,2             FETCH CYL HIGH
0938 0F8656   0EC656  2447          EOR   L6,CHI              COMPARE
0939 2F4546   1DC546  2448          OR    L5,L6
093A 2440C6   1140C6  2449          LINC  L6,L0,1             FETCH HEAD
093B 2F8658   1EC658  2450          EOR   L6,HEAD             COMPARE
093C 2F4546   1DC546  2451          OR    L5,L6
093D 0441C6   0141C6  2452          LINC  L6,L1,1             FETCH RECORD
093E 0F8659   0EC659  2453          EOR   L6,REC              COMPARE
093F 0F45C6   0DC5C6  2454          ORU   L5,L6
                      2455 *
                      2456 ************************************************
                      2457 *    THE FOLLOWING SUBROUTINE COMPARES KL AND DL
                      2458 ************************************************
                      2459 *
0940 2440C5   1140C5  2460 TEFCMPKD LINC  L5,L0,1             FETCH KEY LENGTH
0941 2401C6   1041C6  2461          LINC  L6,L1,0             FETCH DATA LENGTH HIGH
0942 27C0C7   1F40C7  2462          LDEC  L7,L0,1             FETCH DL LOW
0943 0F855A   0EC55A  2463          EOR   L5,KCNT             COMPARE KL
0944 2F8654   1EC654  2464          EOR   L6,MSC2             COMPARE DL HIGH
0945 0F875B   0EC75B  2465          EOR   L7,DCNT             COMPARE DL LOW
0946 2E0601   18C601  2466          ANDI  L6,1                MASK DATA LENGHT HIGH
0947 2F4546   1DC546  2467          OR    L5,L6               *
0948 2F45C7   1DC5C7  2468          ORU   L5,L7               RETURN
                      2469 ************************************************
                      2470 *       ORIENTATION BREAK OUT
                      2471 ************************************************
                      2472 *
0949 200757   100757  2473 TEFDECOD B     TEFENDHA            ;
094A 000800   000800  2474          B     TEFCOUNT            ;
094B 200900   100900  2475          B     TEFKEY              ;
094C 20084A   10084A  2476          B     TEFDATA             ;
094D 000800   000800  2477          B     TEFCOUNT            ;
094E 20094E   10094E  2478          B     *                   ;
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

094F 200909   100909  2479          B     TEFKEY1             ;
0950 000908   000908  2480          B     TEFDATA1            ;
                      2481 *
                      2482 *
                      2483 *
                      2484 *
                      2485 *
                      2486 *
                      2487 *
                      2488 *
                      2489          END COPY-MEMBER TEF
                      2490      COPY      TEN12
                      2491 ************************************************
                      2492 *    END PROCEDURE FOR READ, WRITE AND SCAN
                      2493 ************************************************
                      2494 *
                      2495 *--->FINISH PADDING IF IN PROGRESS
                      2496 *
0951 0C1110   00D110  2497 TENSTART TANDI CEB1,PADTOIDX       PAD TO INDEX?
0952 024954   090954  2498          BZ    TENOPDWN            GO IF NO
0953 0003E0   0003E0  2499          BU    TDXWADEX            GO TO WAIT FOR INDEX
                      2500 *        TBON  7,PAH,TENOPDWN      ***** THESE INSTRUCTIONS NOT
                      2501 *        ORI   MSC1,ERASE          ***** NEEDED IF WE ONLY PAD
                      2502 *        B     TDXFLPHD            ***** EVEN OR ODD HALF TRACK
0954 201580   101580  2503 TENOPDWN BU    TRDOPDWN            ISSUE OP DOWN TAG
                      2504 *
                      2505 *--->FINISH CHANNEL TRANSFER IF IN PROGRESS
                      2506 *
0955 064959   094959  2507          TIBOF FINCHXFR,GEN1,TENDCF   GO IF TRANSFER NOT IN PROGRESS
0956 2E098F   18C98F  2508          ANDI  GEN1,FF-FINCHXFR    RESET MARK
0957 270B5A   1C4B5A  2509          TIBOF NOOP,STAT,*+3       GO IF COMMAND NOT NO-OP'D
0958 0A2300   08A300  2510          LBI   DST,0               TERMINATE TRANSFER & RESET CHANNEL
0959 200A50   100A50  2511 TENDCF   B     TENDDCF             GO TO NEXT STEP IN END PROCEDURE
095A 2A0186   188186  2512          LBI   L1,D(DDCFORGR+6)    ADDRESS OF INITIAL N
095B 2401C6   1041C6  2513          LINC  L6,L1,0             FETCH STARTING N
095C 0A0400   088400  2514          LBI   L4,0                INITIALIZE WORK REG
095D 2FC41C   1FC41C  2515          ADD1  L4,NREC             ADD 1 TO FINAL N & MOVE TO WORK REG
095E 0E84FF   0AC4FF  2516          EORI  L4,FF               SUBTRACT (NF+1)
095F 0FC604   0FC604  2517          ADD1  L6,L4                 FROM NI
0960 008965   020965  2518          BCY   TENCHCNT            GO IF RESULT IS NOT NEGATIVE
0961 0A0400   088400  2519          LBI   L4,0                INTITALIZE Y TO ZERO
0962 2A0500   188500  2520          LBI   L5,0                    IF NF=NI
0963 2A0801   188801  2521          LBI   L8,X'01'            L8 NEEDED FOR CONTROL LATER
0964 200A00   100A00  2522          B     TENHOP              SKIP THE CALCULATION
0965 001E80   001E80  2523 TENCHCNT BU    TWRCHCNT            CALCULATE (NI-NF)(KL+DL-2)
0966 078869   0E4869  2524          TBOFF 6,L8,*+3            GO IF NOT 1 BYTE XFER
0967 0A0501   088501  2525          LBI   L5,1                LOAD 1 TO CNTR
0968 200A00   100A00  2526          B     TENHOP              GO CONTINUE IN NEXT BLOCK
0969 2EC502   18C502  2527          ADDI  L5,2                ADD 2
096A 0F4410   0DC410  2528          ADDC  L4,ZER                TO THE RESULT
                      2529 *    NOW L4 & L5 CONTAIN Y=(NI-NF)(KL+DL)
096B 200A00   100A00  2530          B     TENHOP              FOR ADDRESSING
                      2531 ************************************************************
                      2532 *    SUBROUTINE TO CHECK CHANNEL COUNTER AND RESTORE DDCR
                      2533 ************************************************************
                      2534 *
                      2535 *         BEFORE ENTERING, SET ACTUAL CHANNEL BYTE COUNT -1 INTO L5 &
                      2536 *         LOAD L8 WITH DISPLACEMENT ADDRESS FOR THE RETURN BRANCH
                      2537 *
096C 2011C6   1011C6  2538 TENAJAX  BU    TIORDDCR            FETCH CURRENT DDCR VALUE
096D 0A0400   088400  2539          LBI   L4,0                SET L4 FOR CCH
096E 001EB5   001EB5  2540          BU    TWRCHKCR            GO CHECK CHANNEL COUNTER
096F 2B3D05   1CBD05  2541          MV    B00,L5              CHANNEL COUNT TO B00
0970 0E2340   08E340  2542          ANDI  DST,CHOUTVAL        MOVE B00 TO CIO
0971 0A3D00   08BD00  2543          LBI   B00,0               HIGH DIFFERENCE IS ZERO
0972 07C0C5   0F40C5  2544          LDEC  L5,L0,1             FETCH INITIAL
0973 2400C4   1040C4  2545          LINC  L4,L0,0                 DDCR
0974 0011C8   0011C8  2546          BU    TIOUDDCR            GO TO SUBROUTINE TO UPDATE DDCR
0975 0D8442   06C442  2547          TEOR  L4,L2               CHECK HI ORDER RESULT
0976 204979   110979  2548          BNZ   *+3                 GO IF NOT EQUAL
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0977 0D8543  06C543  2549          TEOR  L5,L3              CHECK LO ORDER RESULT
0978 22497B  19097B  2550          BZ    *+3                GO IF EQUAL
0979 2A0829  188829  2551          LBI   L8,X'29'           POST LSR UPDATE ERROR
097A 201E44  101E44  2552          B     TWRFMT2E           FINISH POSTING FMT 2 ERROR
097B 210908  140908  2553          BR    B(TENAJAX),L8      RETURN DIRECTLY OR BY RETURN BRANCH
097C 001047  001047  2554 TENTIOA1 B     TIOTENB1           RETURN
097D 000A7F  000A7F  2555 TENTENA1 B     TENTENB1           RETURN
097E 000A61  000A61  2556 TENTENA2 B     TENTENB2           RETURN
                     2557          MBLOK
097F 00097F  00097F  2558+         B     *                  UNUSED  ::::::::::
0A00                 2559+         DS    <0>B
0A00 258C0D  164C0D  2560 TENHOP   TBON  6,QBYT,TENWRKD     GO IF WRITE OP
                     2561 *
                     2562 *--->FINISH CHANNEL TRANSFER FOR READ KEY-DATA
                     2563 *
0A01 058B08  064B08  2564          TIBON UNITCHK,STAT,TENW500  GO IF UNIT CHECK IS ON
0A02 0A0736  088736  2565          LBI   L7,D(TIOTENA3)     LOAD DISPLACEMENT FOR SUBR RETURN
0A03 27C907  1F4907  2566          TBOFF 7,GEN1,TENGOWAT    GO IF ODD XFER OFF
0A04 04C407  034407  2567          TBON  3,L4,TENGOWAT      GO IF HIGH COUNT NOT ZERO
0A05 0CC5FD  03C5FD  2568          TADDI L5,X'FD'           GO IF COUNT
0A06 028A0B  0A0A0B  2569          BNC   TENTIOB3             IS LESS THAN 3
0A07 20101F  10101F  2570 TENGOWAT B     TIOFWAIT           GO TO SUBR, WAIT FOR END OF CHNL XFR
0A08 0ED001  0BD001  2571 TENW500  ADDI  ZER,1              500 MICROSECOND
0A09 028A08  0A0A08  2572          BNC   TENW500              WAIT LOOP
0A0A 000D72  000D72  2573          B     TERINCDR             GO TO CHECK FOR END CHAN XFER
0A0B 066313  096313  2574 TENTIOB3 TIBOF DIFFZERO,DST,TENNOZER  GO IF DIFF CNTR ZERO IS OFF
0A0C 000A1A  000A1A  2575          B     TENCHK             GO CHECK CHANNEL COUNTER
                     2576 *
                     2577 *--->FINISH CHANNEL TRANSFER FOR WRITE KEY-DATA
                     2578 *
0A0D 058B1A  064B1A  2579 TENWRKD  TIBON UNITCHK,STAT,TENCHK    GO IF UNIT CHECK IS POSTED
0A0E 05C850  074850  2580          TBON  7,LB,TENDDCF       GO IF ZERO LENGTH DATA TRANSFER
0A0F 04A312  026312  2581          TIBON ENDCHXFR,DST,TENEND   GO IF END OF CHANNEL TRANSFER ON
0A10 2A0825  188825  2582 TENL825 LBI   L8,X'25'            POST ERROR - NO END OF CHAN XFER
0A11 201E44  101E44  2583          B     TWRFMT2E           GO POST EQUIPMENT CHECK
0A12 246315  116315  2584 TENEND   TIBON DIFFZERO,DST,TENZER   GO IF DIFFERENCE COUNTER ZERO ON
0A13 2A0826  188826  2585 TENNOZER LBI   L8,X'26'           POST ERROR - DIFF COUNTER NOT ZERO
0A14 201E44  101E44  2586          B     TWRFMT2E           GO POST EQUIPMENT CHECK
0A15 0A2300  08A300  2587 TENZER   LBI   DST,0              STOP DATA TRANSFER, RESET CHNL HDWR
0A16 0011CB  0011CB  2588          BU    TIORDDDR           FETCH CURRENT DDDR TO L2 AND L3
0A17 201E87  101E87  2589          BU    TWRCHKDR           GO CHECK THE CHANNEL COUNTER
0A18 2010FB  1010FB  2590          BU    TIODDDR1           FETCH DDDR TO L2 & L3,INCREMENT BY 1
0A19 200A50  100A50  2591          B     TENDDCF            MOVE ON TO NEXT STEP IN END PROC
0A1A                 2592 TENTIO64 EQU   *
0A1A 0A2300  08A300  2593 TENCHK   LBI   DST,0              RESET DATA TRANSFER AND CHNL HDWR
0A1B 2010FB  1010FB  2594          BU    TIODDDR1           FETCH DDDR TO L2 & L3,INCREMENT BY 1
0A1C 0A0112  088112  2595 TENDDDR  LBI   L1,D(DDDRORG)      DISPLACEMENT OF DDDR IN CS
0A1D 0441C6  0141C6  2596          LINC  L6,L1,1            FETCH INITIAL
0A1E 0401C7  0041C7  2597          LINC  L7,L1,0              DDDR
0A1F 2E86FF  1AC6FF  2598          EORI  L6,FF              SUBTRACT
0A20 0E87FF  0AC7FF  2599          EORI  L7,FF                INITIAL
0A21 0FC703  0FC703  2600          ADDI  L7,L3                  FROM
0A22 2F4602  1DC602  2601          ADDC  L6,L2                    FINAL DDDR
0A23 078C26  0E4C26  2602          TBOFF 6,QBYT,TENLINE     GO IF NOT
0A24 27CC26  1F4C26  2603          TBOFF 7,QBYT,TENLINE       SCAN OP
0A25 200A4B  100A4B  2604          B     TENSCNOP           GO HANDLE SCAN OP
                     2605 *--->NOW L6 & L7 CONTAIN X=(DDDRF-DDDRI)
0A26 27882F  1E482F  2606 TENLINE  TIBOF UNITCHK,STAT,TENWRTST  GO IF UNIT CHECK IS OFF
0A27 25912F  16512F  2607          TIBON PROCKEY,CEB1,TENWRTST  GO IF PROCESS KEY IS ON
0A28 25D12D  17512D  2608          TIBON PROCDAT,CEB1,TENDER  GO IF PROCESS DATA IS ON
0A29 2F051E  1CC51B  2609          ADD   L5,DCNT            ADD DATA LENGTH
0A2A 0F4410  0DC410  2610          ADDC  L4,ZER               TO TOTAL TRANSFER COUNT
0A2B 07D42D  0F542D  2611          TIBOF DL256,MSC2,TENDER  GO IF DATA LENGTH NOT 256
0A2C 0EC401  08C401  2612          ADDI  L4,1               ADD 256 TO COUNT
0A2D 0F051A  0CC51A  2613 TENDER   ADD   L5,KCNT            ADD KEY LENGTH
0A2E 0F4410  0DC410  2614          ADDC  L4,ZER               TO TOTAL BYTE TRANSFER COUNT
0A2F 058C41  064C41  2615 TENWRTST TBON  6,QBYT,TENWROP     GO IF WRITE OP
0A30 2D8547  16C547  2616          TEOR  L5,L7              TEST FOR X=Y IN LOW BYTE POSITION
0A31 024A3E  090A3E  2617          BZ    TENLOOK            GO IF EQUAL
0A32 06.234  085234  2618 TENNOK   TIBOF READ,CE#2,*+2      GO IF READ
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0A33 06CD35  0B4D35  2619          TBOFF 3,RBYT,*+2           KEY-DATA CMD
0A34 201E41  101E41  2620          B     TWRL824            POST ERROR
0A35 27C934  1F4934  2621          TBOFF 7,GEN1,*-1         GO POST ERROR IF ODD XFER OFF
0A36 2E09FE  18C9FE  2622          ANDI  GEN1,X'FE'         RESET MARK IN CASE 2ND TIME AROUND
0A37 0E5102  09D102  2623          ORI   CE81,PROCKEY       SET MARK SO THAT L4,L5 NOT UPDATED
0A38 0E7391  09F391  2624          ORI   DXC,X'91'          SET UP  CHANNEL 1 BYTE TRANSFER
0A39 0E3393  08F393  2625          ANDI  DXC,X'93'          RESET CHANNEL ODD XFER AND COUNTERS
0A3A 2A2100  18A100  2626          LBI   CCH,0              CHANNEL TRANSFER COUNT
0A3B 0A3100  08B100  2627          LBI   CCL,0                IS ZERO FOR 1 BYTE TRANSFER
0A3C 2A0737  188737  2628          LBI   L7,D(TIOTENA4)      LOAD DISPLACEMENT FOR SUBR RETURN
0A3D 00101E  00101E  2629          B     TIOCHXFR           GO TO SUBROUTINE TO TRANSFER 1 BYTE
0A3E 2D8446  16C446  2630 TENLOOK  TEOR  L4,L6               TEST FOR X=Y IN HIGH BYTE POSITION
0A3F 204A32  110A32  2631          BNZ   TENNOK             GO IF NOT, ERROR INDICATED
0A40 200A50  100A50  2632          B     TENDDCF            CONTINUE INTO NEXT STEP OF END PROC
                     2633 *--->NEXT CALCULATE (X-Y) FOR DECREMENTING DDDR ON WRITE OP
0A41 0E84FF  0AC4FF  2634 TENWROP  EORI  L4,FF              SUBTRACT
0A42 2E85FF  1AC5FF  2635          EORI  L5,FF                Y
0A43 0FC705  0FC705  2636          ADDI  L7,L5                FROM
0A44 2F4604  1DC604  2637          ADDC  L6,L4                  X
0A45 008A4B  020A4B  2638          BCY   TENSCNOP           GO IF POSITIVE VALUE
0A46 2E86FF  1AC6FF  2639          EORI  L6,FF              COMPLEMENT L6
0A47 0E87FF  0AC7FF  2640          EORI  L7,FF                AND L7
0A48 0EC701  0BC701  2641          ADDI  L7,1                   AND
0A49 2F4610  1DC610  2642          ADDC  L6,ZER                   ADD 1
0A4A 000A4C  000A4C  2643          B     TENSCNOR           DON'T TURN ON SUBTRACT BIT
                     2644 *--->SUBTRACT (X-Y) FROM CURRENT DDDR
0A4B 0E7302  09F302  2645 TENSCNOP ORI   DXC,SUBTRACT       TURN ON THE LSR SUBTRACT BIT
0A4C 083D07  0CBD07  2646 TENSCNOR MV    BOO,L7             MOVE LOW DIFFERENCE TOWARD CHANNEL
0A4D 0E2340  08E340  2647          ANDI  DST,CHOUTVAL       LOW DIFF TO CIO
0A4E 2B3D06  1CBD06  2648          MV    BOO,L6             HIGH DIFF TOWARD CHANNEL
0A4F 0011CD  0011CD  2649          BU    TIOUDDDR           DECREMENT DDDP BY CALCULATED VALUE
                     2650 *
                     2651 *--->RESTORE DDCF IF REQUIRED
                     2652 *
0A50 2689C1  1A49C1  2653 TENDDCF  TIBOF FIXDDCF,GEN1,TENHACNT  GO IF RESTORE NOT REQUIRED
0A51 2E09DF  18C9DF  2654          ANDI  GEN1,FF-FIXDDCF    RESET MARK
0A52 278B54  1E4B54  2655          TIBOF UNITCHK,STAT,*+2   GO IF NO UNIT CHK
0A53 0016F0  0016F0  2656          BU    TSCRDDCF           GO RESTORE CCHHKLDLDL IN DDCF FM DAS
0A54 2018EB  1018EB  2657          BU    TSNWIN3            CONVERT CCHH FROM 3340 TO S/3
0A55 0F0002  088002  2658          LBI   L0,D(DDCFORGL+2)   LOAD DISPL OF FLAG BYTE FOR SUBR
0A56 0008FA  0008FA  2659          BU    TENFLG02           GO ZERO BITS 0-2 OF FILE FLAG
0A57 0A0194  088184  2660          LBI   L1,D(DDCFORGR+4)   DISPLACEMENT OF REC IN CS
0A58 048199  024199  2661          SINC  REC,L1,2           STORE REC &
0A59 24019C  10419C  2662          SINC  NREC,L1,0            N BYTES
0A5A 065A5C  095A5C  2663          TIBOF DDCRODD,MSC2,TENXDDCF  GO IF DDCR IS EVEN
0A5B 0015F5  0015F5  2664          BU    TRDMODD            SHIFT DDCF BACK TO ODD BOUNDARY
0A5C 2A3108  188108  2665 TENXDDCF LBI   CCL,8              TRANSFER 10 BYTES
0A5D 2008EF  1008EF  2666          BU    TENSODCF           GO DO CHANNEL TRANSFER
0A5E 2A0509  188509  2667          LBI   L5,9                TEN BYTES TRANSFERRED
0A5F 0A067E  08887E  2668          LBI   L8,D(TENTENA2)     SET UP DISPLACEMENT FOR SUBR RETURN
0A60 20096C  10096C  2669          B     TENAJAX            GO CHECK CHAN CNTR & RESTORE DDCR
                     2670 *
                     2671 *--->TRANSFER HA OR COUNT FIELD IF REQUIRED
                     2672 *
0A61                 2673 TENTEN82 EQU   *
0A61 050910  00C910  2674 TENHACNT TANDI GEN1,XFRHACNT       TEST IF THIS STEP IS REQD
0A62 024A7F  090A7F  2675          BZ    TENXDDDF             GO IF NOT REQUIRED TO DO THIS
0A63 2E09EF  18C9EF  2676          ANDI  GEN1,FF-XFRHACNT     RESET THIS MARK
0A64 2508BF  14487F  2677          TIBON NOOP,STAY,TENXDDDF   CONTINUE TO NEXT STEP IF NO-OP
0A65 2018EB  1018EB  2678          BU    TSNWIN3            CONVERT CCHH FROM 3340 TO S/3
0A66 05CD6C  07406C  2679          TBON  7,RBYT,TENRDHA     GO IF THIS IS A READ HA
0A67 05117F  04517F  2680          TIBON PROCRO,CEB1,TENXDDDF  GO IF PROCESS RO IS ON
0A68 25517F  15517F  2681          TIBON PROCNT,CEB1,TENXDDDF  GO IF PROCESS COUNT IS ON
0A69 0A0508  068508  2682          LBI   L5,8               SET UP TO
0A6A 2A3107  188107  2683          LBI   CCL,7                TRANSFER 9 BYTES
0A6B 200A78  100A78  2684          B     TENALCF              AND GO DO IT
0A6C 0C1207  00D207  2685 TENRDHA  TANDI CEB2,X'07'         MASK TO CHECK FOR END OF HA
0A6D 024A76  090A76  2686          BZ    TENCH5               GO IF IT IS
0A6E 0E5208  09D208  2687          ORI   CEB2,WHAOK         SET WRITE HA MARK
0A6F 2A0000  188000  2688          LBI   L0,D(DDCFORGL3)     FETCH DISPLACEMENT OF SDH
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0A70 2A0180  188180  2689          LBI   L1,D(DDCFORGR)       **        **      ** SDL
0A71 0400DD  0040DD  2690          LINC  SDH,L0,0             FETCH
0A72 2401DE  1041DE  2691          LINC  SDL,L1,0               THEM BOTH
0A73 0A001A  08801A  2692          LBI   L0,D(SDFORHA)        FETCH DISPLACEMENT OF STORED SD
0A74 04409D  01409D  2693          SINC  SDH,L0,1             STORE THE NEW
0A75 24009E  10409E  2694          SINC  SDL,L0,0               SD BYTES FOR THE WRITE HA
0A76 0A0504  088504  2695 TENCH5   LBI   L5,4                 SET UP TO
0A77 0A3103  088103  2696          LBI   CCL,3                  TRANSFER 5 BYTES TO CHANNEL
0A78 0A0002  088002  2697 TENALCF  LBI   L0,D(DDCFORGL+2)     LOAD DISPL OF FLAG BYTE FOR SUBR
0A79 000BFA  000BFA  2698          BU    TENFLG02             GO ZERO BITS 0-2 OF FILE FLAG
0A7A 26547C  19547C  2699          TIBOF DDCRODD,MSC2,TENCHXFR  GO IF DDCF IS ON EVEN BOUNDARY
0A7B 0015F5  0015F5  2700          BU    TRDMODD              ALIGN DDCF TO ODD BOUNDARY
0A7C 200BEF  100BEF  2701 TENCHXFR BU    TENSDDCF             STORE DDCF TO CHANNEL
0A7D 0A087D  08887D  2702          LBI   L8,D(TENTENA1)       SET DISPLACEMENT FOR SUBROUTINE
0A7E 20096C  10096C  2703          B     TENAJAX              GO CHECK CHAN COUNT & RESTORE DDCR
0A7F                 2704 TENTENB1 EQU   *
0A7F 000B00  000B00  2705 TENXDDDF B     TENDDDF              CONTINUE
                     2706          MACLOK
0B00                 2707+         DS    <0>B
                     2708 *
                     2709 *--->TRANSFER DDDF IF REQUIRED
                     2710 *
0B00 070942  0C4942  2711 TENDDDF  TIBOF XFRDDDF,GEN1,TENCNTR  GO IF THIS STEP NOT REQUIRED
0B01 2E09F7  18C9F7  2712          ANDI  GEN1,FF-XFRDDDF      RESET THIS MARK
0B02 050B42  044B42  2713          TIBON NOOP,STAT,TENCNTR    GO IF THIS COMMAND IS NO-OP'D
0B03 278C17  1E4C17  2714          TBOFF 6,QBYT,TENFRDHA      GO IF THIS IS A READ OP
0B04 056706  056706  2715          TIBON SCNSAT,FHF,*+2       GO IF SCAN HIT
0B05 000A1A  000A1A  2716          B     TENCHK               GO RESTORE DDDR FOR NO SCAN HIT
0B06 0A001C  08801C  2717          LBI   L0,D(SCANSTOR)       DISPLACEMENT OF STORED SCAN BYTES
0B07 2A2100  18A100  2718          LBI   CCH,0                CCH IS 0 FOR DDDF RESTORE ON SCAN
0B08 0440C1  0140C1  2719          LINC  L1,L0,1              CCL OBTAINED FROM SCANSTOR BYTE 1
0B09 0B3101  0CB101  2720          MV    CCL,L1               **********************************
0B0A 2400C8  1040C8  2721          LINC  L8,L0,0              FETCH SUBR CONTROL DATA XFR BYTE
0B0B 2E14DF  18D4DF  2722          ANDI  MSC2,FF-DDDRODD      DDDRODD MUST BE OFF NOW
0B0C 0008DE  0008DE  2723          BU    TENSDDDF             GO TRANSFER DDDF TO CHANNEL
0B0D 0011CB  0011CB  2724          BU    TIORDDDR             FETCH DDDR
0B0E 2A0401  188401  2725          LBI   L4,X'01'             SET DDDR INCREMENT COUNT TO 256 FOR
0B0F 0A0501  088501  2726          LBI   L5,X'01'               NO TRANSFER, OTHERWISE 257
0B10 25C813  174813  2727          TBON  7,L8,TENCHKDR        GO IF ZERO BYTE XFER
0B11 061413  085413  2728          TIBOF SCANSW,MSC2,*+2      GO IF 257 IS CORRECT
0B12 2EC501  18C501  2729          ADDI  L5,1                 MAKE INCREMENT 258
0B13 201EB7  101EB7  2730 TENCHKDR BU    TWRCHKDR             GO CHECK DDDR
0B14 2B0604  1C8604  2731          MV    L6,L4                MOVE HI DIFFERENCE
0B15 2B0705  1C8705  2732          MV    L7,L5                MOVE LO DIFFERENCE
0B16 200A4B  100A4B  2733          B     TENSCNOP             GO RESTORE DDDR
0B17 0A0400  088400  2734 TENFRDHA LBI   L4,0                 INITIALIZE CCH TO ZERO
0B18 0A0800  088800  2735          LBI   L8,X'00'               AND CONTROL BYTE FOR 2-256 BYTES
0B19 25CD29  174D29  2736          TBON  7,RBYT,TENDFCCH      GO IF READ HA OP
0B1A 278B26  1E4B26  2737          TIBOF UNITCHK,STAT,TENKLDL   GO IF NO UNIT CHECK POSTED
0B1B 059142  065142  2738          TIBON PROCKEY,CE81,TENCNTR   GO IF PROCESS KEY FIELD IS ON
0B1C 27D126  1F5126  2739          TIBOF PROCDAT,CE81,TENKLDL   GO IF PROCESS DATA IS OFF
0B1D 2B051A  1C851A  2740          MV    L5,KCNT              MOVE KEY COUNT TO CHAN CNTR
0B1E 06DA42  085A42  2741          TBOFF 3,KCNT,TENCNTR       GO IF KEY LENGTH ZERO
0B1F 0C9A01  02DA01  2742 TENKTEST TEQRI KCNT,X'01'           TEST FOR KEY LENGTH OF 1
0B20 204B24  110B24  2743          BNZ   TENLTEST             GO IF IT IS NOT
0B21 2A0802  188802  2744          LBI   L8,X'02'              INDICATE 1 BYTE TRANSFER
0B22 2A0500  188500  2745          LBI   L5,0                   SET CCL FOR THIS CONDITION
0B23 000B36  000B36  2746          B     TENXP2                 AND PROCEED
0B24 2EC5FE  18C5FE  2747 TENLTEST ADDI  L5,X'FE'             SUBTRACT 2 FROM CHANNEL COUNT
0B25 000B36  000B36  2748          B     TENXP2                 AND PROCEED
0B26 2A0600  188600  2749 TENKLDL  LBI   L6,0                 SET N TO ZERO FOR FOLLOWING SUBR
0B27 001E80  001E80  2750          BU    TWRCHCNT             GO CALCULATE CHANNEL COUNT & SET IT
0B28 000B36  000B36  2751          B     TENXP2               CONTINUE
0B29 089A06  029A06  2752 TENDFCCH SABI  BLOCK8,B(DDDFORG)    SET BLOCK ADDRESS TO DDDF
0B2A 0A0002  088002  2753          LBI   L0,D(DDDFORG+2)         EVEN ALIGNMENT DISP OF FLAG
0B2B 0A0182  088182  2754          LBI   L1,D(DDDFORG+X'80'+2)   EVEN ALIGNMENT DISP OF CHI
0B2C 26942F  1A542F  2755          TIBOF DDDRODD,MSC2,TENLSOK GO IF EVEN ALIGNMENT IS CORRECT
0B2D 2A0082  188082  2756          LBI   L0,D(DDDFORG+X'80'+2)   ODD ALIGNMENT DISP OF FLAG
0B2E 0A0103  088103  2757          LBI   L1,D(DDDFORG+3)         ODD ALIGNMENT DISP OF CHI
0B2F 000BFA  000BFA  2758 TENLSOK  BU    TENFLG02             GO ZERO BITS 0-2 OF FILE FLAG
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0B30 0018DC  0018DC  2759          BU    TSKWIN3              GO CONVERT CCHH FROM 3340 TO S/3
0B31 089A05  029A05  2760          SABI  BLOCK8,B(DDCFORGL)   RESTORE ALS BASE BLOCK POINTER
0B32 0C1207  00D207  2761          TANDI CEB2,X'07'           TEST FOR END OF HA ORIENTATION
0B33 024842  090842  2762          BZ    TENCNTR              GO IF END OF HA
                     2763 *        BU    TENFLG02             GO ZERO BITS 0-2 OF FILE FLAG
                     2764 *        ADDI  L1,2                 ADDRESS OF R IN CONTROL STORE
                     2765 *    -   SINC  REC,L1,0             STORE REC TO R LOCATION IN BUFFER
0B34 0A0400  088400  2766          LBI   L4,0                 SET UP TO
0B35 0A0507  088507  2767          LBI   L5,7                   TRANSFER 9 BYTES TO CHANNEL
0B36 2B3105  1C8105  2768 TENXP2   MV    CCL,L5                 PUT FINAL VALUE OF CHANNEL
0B37 2B2104  1C8104  2769          MV    CCH,L4                   COUNTER IN CCL AND CCH
0B38 25C83E  17483E  2770          TBON  7,L8,TENZDDDF        GO IF ZERO BYTE XFR INDICATED
0B39 07883C  0E483C  2771          TBOFF 6,L8,TENZP2          GO IF NOT 1 BYTE TRANSFER
0B3A 0A0501  088501  2772          LBI   L5,X'01'             BYTE TRANSFER COUNT IS 1
0B3B 200B3E  10083E  2773          B     TENZDDDF             GO STORE DDDF
0B3C 2EC502  1BC502  2774 TENZP2   ADDI  L5,2                 ADD 2 TO CHANNEL
0B3D 0F4410  0DC410  2775          ADDC  L4,ZER                 COUNT FOR ACTUAL COUNT
0B3E 0008DE  0008DE  2776 TENZDDDF BU    TENSDDDF             GO TRANSFER DDDF TO CHANNEL
0B3F 0011CB  0011CB  2777          BU    TIORDDDR             FETCH CURRENT DDDR
0B40 201EB7  101EB7  2778          BU    TWRCHKDR             GO CHECK CHANNEL COUNTER
0B41 2010FB  1010FB  2779          BU    TIODDDR1             INCREMENT DDDR BY 1
                     2780 *
                     2781 *--->UPDATE THE READ USAGE COUNTER IF REQUIRED
                     2782 *
0B42 07895D  0E495D  2783 TENCNTR  TIBOF UPDTRDUS,GEN1,TENTOTCU  GO IF UPDATE NOT REQUIRED
0B43 0A0016  088016  2784          LBI   L0,D(BYTEREAD)       DISP OF BYTE COUNT FOR THIS OP
0B44 2440C6  1140C6  2785          LINC  L6,L0,1              FETCH HI BYTE COUNT
0B45 27C0C7  1F40C7  2786          LDEC  L7,L0,1                "   LO   "    "
0B46 244090  114090  2787          SINC  ZER,L0,1             ZERO TEMP BYTES
0B47 040090  004090  2788          SINC  ZER,L0,0               READ VALUE
0B48 2A001E  18801E  2789          LBI   L0,D(UCWPTR)         GET ADDR OF CURRENT DEVICE POINTER
0B49 2400C1  1040C1  2790          LINC  L1,L0,0              L1 CONTAINS THE POINTER TO SENSE
0B4A 0EC11C  0BC11C  2791          ADDI  L1,28                ADD DISPLACEMENT TO READ USAGE CNTR
0B4B 2441C2  1141C2  2792          LINC  L2,L1,1              FETCH
0B4C 0441C3  0141C3  2793          LINC  L3,L1,1                READ
0B4D 2441C4  1141C4  2794          LINC  L4,L1,1                  USAGE
0B4E 2401C5  1041C5  2795          LINC  L5,L1,0                    COUNTER
0B4F 0F0507  0CC507  2796          ADD   L5,L7                ADD
0B50 2F4406  1DC406  2797          ADDC  L4,L6                  CURRENT
0B51 2F4310  1DC310  2798          ADDC  L3,ZER                   VALUE TO
0B52 0F4210  0DC210  2799          ADDC  L2,ZER                     COUNTER
0B53 279456  1E5456  2800          TIBOF KDGT256,MSC2,*+3     GO IF NO BYTEREAD OVERFLOW
0B54 2EC301  18C301  2801          ADDI  L3,1                 ADD X'10000' TO COUNTER
0B55 0F4210  0DC210  2802          ADDC  L2,ZER                 BECAUSE BYTEREAD CNTR OVERFLOWED
0B56 07C185  0F4185  2803          SDEC  L5,L1,1              STORE
0B57 27C184  1F4184  2804          SDEC  L4,L1,1                THE
0B58 07C183  0F4183  2805          SDEC  L3,L1,1                  COUNTER
0B59 240182  104182  2806          SINC  L2,L1,0                    BACK
0B5A 26025D  18425D  2807          TBOFF 0,L2,TENTOTCU        GO IF NOT COUNTER OVERFLOW
0B5B 0011F4  0011F4  2808          BU    TIPBSGEN             GENERATE BSDA
0B5C 0F4A42  0DCA42  2809          OR    UNCK,L2              TURN ON CNTR O'FLOW FOR THIS DRIVE
0B5D 20011F  10011F  2810 TENTOTCU B     TCUSTART             GO TO TCU TO CLEAN UP AND END OP
                     2811 ************************************************
                     2812 *    SUBROUTINE TO STORE DDDF TO CHANNEL
                     2813 ************************************************
                     2814 *         RULES FOR USING THIS SUBROUTINE:
                     2815 *           1.  IF ZERO BYTES ARE TO BE TRANSFERRED, SET L8 '01';
                     2816 *               IF A SINGLE BYTE IS TO BE TRANSFERRED, SET L8='02';
                     2817 *               IF 2-256 BYTES ARE TO BE TRANSFERRED,SET L8='00' OR'04'.
                     2818 *               IF EXTENDED CHANNEL OP(READ KEY-DATA), MASK L8 WITH X'03'
                     2819 *           2.  SET CCH,CCL=(N+1)(KL+DL-2).
                     2820 *
0B5E 25C86E  17486E  2821 TENSDDDF TBON  7,L8,TENFGONE        GO IF NO DATA TRANSFER INDICATED
0B5F 089E86  029E86  2822          SABI  BLOCKCH,B(DDDFORG+X'8000')  SET BLOCK TO DDDF BUFFER
0B60 088E00  028E00  2823          SADI  DISPCH,D(DDDFORG)    SET DISPLACEMENT TO FIRST BYTE
0B61 261163  185163  2824          TIBOF ROCTODF,CE81,*+2     SKIP IF NOT READ RO COUNT
0B62 28BE02  128E02  2825          SADI  DISPCH,D(DDDFORG+2) CHANNEL DISPLACEMENT POINTS TO FLAG
0B63 2A3390  1B8390  2826          LBI   DXC,DATACHAN+LSRSELDR RESET DXC TO SET UP FOR CHAN STORE
0B64 08D7DD  0397DD  2827          SZI   ZLSCH,ZLSSCHAN       SET ZLS TO STORE TO CHANNEL
0B65 278867  1E4867  2828          TBOFF 6,L8,*+2             GO IF NOT 1 BYTE TRANSFER
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0B56 0E7301   09F301  2829          ORI   DXC,CHNL1BYT        SET CHANNEL 1 BYTE TRANSFER BIT
0B57 069469   0A5469  2830          TIBOF DDDRODD,MSC2,*+2    GO IF DDDR IS ON EVEN BOUNDARY
0B68 0E7340   09F340  2831          ORI   DXC,CHANODD        SET ODD TRANSFER CHANNEL BIT
0B69 24496C   11496C  2832          TIBON FINCHXFR,GEN1,TENOPEN  GO IF EXTENDED CHANNEL TRANSFER
0B6A 2A0734   188734  2833          LBI   L7,D(TIOTENA1)      SET UP RETURN POINTER AND
0B6B 00101E   00101E  2834          B     TIOCHXFR              GO TRANSFER DDDF TO CHANNEL
0B6C 0E7308   09F308  2835 TENOPEN  ORI   DXC,ALOWCHAN        ALLOW CHANNEL DIFFERENCE COUNTER
0B6D 2A2310   18A310  2836          LBI   DST,ALWCHXFR       INITIATE CHANNEL TRANSFER
0B6E                  2837 TENTIOB1 EQU   *
0B6E 0F90D0   0ED0D0  2838 TENFGONE EORU  ZER,ZER            RETURN
                      2839 ************************************************
                      2840 *    SUBRGUTINE TO TRANSFER DDCF TO CHANNEL
                      2841 ************************************************
                      2842 *
                      2843 *          BEFORE ENTERING, SET CCL TO (CHANNEL COUNT-2)
                      2844 *
0B6F 0A2300   08A300  2845 TENSDDCF LBI   DST,0              RESET ALLOW CHANNEL XFER
0B70 0A3380   08B380  2846          LBI   DXC,X'80'          SET DXC FOR CS TO CHANNEL XFER
0B71 089E85   029E85  2847          SABI  BLOCKCH,B(DDCFORGL+X'8000') SET BLOCK TO DDCF BUFFER
0B72 28BE02   12BE02  2848          SADI  DISPCH,D(DDCFORGL+2)  SET DISPLACEMENT TO FLAG BYTE
0B73 265475   195475  2849          TIBOF DDCRODD,MSC2,*+2    GO IF DDCR EVEN
0B74 0E7340   09F340  2850          ORI   DXC,CHANODD        SET CHANNEL ODD TRANSFER
0B75 08D7DD   0397DD  2851          SZI   ZLSCH,ZLSSCHAN     STORE TO CHANNEL
0B76 2A2100   18A100  2852          LBI   CCH,0              SET UP CCH
0B77 0A0735   088735  2853          LBI   L7,D(TIOTENA2)     SET DISPLACEMENT FOR SUBR RETURN
0B78 00101E   00101E  2854          B     TIOCHXFR           GO DO THE CHANNEL TRANSFER
0B79 0F90D0   0ED0D0  2855 TENTIOB2 EORU  ZER,ZER            RETURN
                      2856 ************************************************************
                      2857 *    SUBROUTINE TO SET BITS 0-2 OF FLAG BYTE TO ZERO
                      2858 ************************************************************
                      2859 *
                      2860 *          BEFORE ENTERING, SET LO TO POINT TO FLAG BYTE
                      2861 *
0B7A 2400D5   1040D5  2862 TENFLGO2 LINC  FLAG,LO,0          FETCH FLAG BYTE FROM CONTROL STORE
0B7B 0E151F   08D51F  2863          ANDI  FLAG,X'1F'         RESET BITS 0-2
0B7C 244095   114095  2864          SINC  FLAG,LO,1          STORE IT BACK IN SAME LOCATION
0B7D 0F9CD0   0ED0D0  2865          EORU  ZER,ZER            RETURN
                      2866          %BLOK
0B7E 000B7E   000B7E  2867+         B     *                  UNUSED  ::::::::::::
0B7F 200B7F   100B7F  2868+         B     *                  UNUSED  ::::::::::::
0C00                  2869+         DS    <0>B
                      2870          END COPY-MEMBER TEN12
                      2871      COPY      TER
                      2872 ******** ************************************
                      2873 *  C H E C K   E N D   ANALYSIS ROUTINE
                      2874 ************************************************
                      2875 *
0C00 0E2FF7   08EFF7  2876 TERCKEND ANDI  SCN,FF-ALWFXFR      TURN OFF ALLOW FILE XFER
0C01 00158D   00158D  2877          BU    TRDRDFBI           GATE FI  TO FBI
0C02 0B0322   0C8322  2878          MV    L3,FBI             COPY FILE BUS IN
0C03 20099A   10099A  2879          BU    TEFRESP            RAISE RESPONSE TO FILE
0C04 26030C   18430C  2880 TERCEANI TIBOF CMDOVN,L3,TERNOVRN  GO IF NOT COMMAND OVERRUN
0C05 2A080B   18880B  2881          LBI   L8,X'0B'           POST CMD OVERRUN MESSAGE
0C06 05E60A   07660A  2882          TBON  7,FTO,TERL705      GO IF WRITING
0C07 2A0408   188408  2883          LBI   L4,X'08'           PRESET HD SWITCH TIMER EXPIRE CHECK
0C08 0C1207   0CD207  2884          TANDI CEB2,X'07'         CHECK FOR READ G1 OP
0C09 224707   190707  2885          BZ    TEFNRERR           GO POST UPGM DETECTED ERROR IF IT IS
0C0A 0A0705   088705  2886 TERL705  LBI   L7,X'05'           POST OVERRUN
0C0B 201908   101908  2887          B     TSNNORM            GO TO ERROR ROUTINE
0C0C 06430F   09430F  2888 TERNOVRN TIBOF DATAOVN,L3,TERNSYER GO IF NOT SYNC OUT ERROR
0C0D 0A0814   088814  2889 TERL814  LBI   L8,X'14'           POST SYNC OUT ERROR MSG
0C0E 200708   100708  2890 TEREQPCK B     TEFL703            GO POST EQUIPMENT CHECK
0C0F 2A0810   188810  2891 TERNSYER LBI   L8,X'10'           INITIALIZE FMT 1 MSG 0
0C10 25E60E   17660E  2892          TBON  7,FTO,TEREQPCK     GO IF WRITE OP (UNDEFINE CHK END)
0C11 0C0310   00C310  2893          TANDI L3,DATACHK         GO IF DATA CHECK
0C12 204C16   110C16  2894          BNZ   TERDATCK                        (NOT CMD OVERRUN)
0C13 050332   044332  2895          TIBON NOAM,L3,TERDOIDX   GO IF NO AM FOUND
0C14 07430E   0D430E  2896          TIBOF NOSYNC,L3,TEREQPCK GO IF NOT NO SYNC FOUND
0C15 0EC804   0BC804  2897          ADDI  L8,X'04'           INITIALIZE NO SYNC BYTE FOUND MSG
0C16 2EC830   18C830  2898 TERDATCK ADDI  L8,X'30'           INITIALIZE DATA CHECK MSG
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0C17 0C1207   00D207  2899          TANDI CEB2,X'07'         TEST TRACK ORIENTATION
0C18 024C2A   090C2A  2900          BZ    TERNSCNT           GO IF HA FIELD
0C19 27922D   1E522D  2901          TBOFF 6,CEB2,TERCNT      GO IF ANY COUNT FIELD
0C1A 07D221   0F5221  2902          TBOFF 7,CEB2,TERMSG46    GO IF KEY FIELD
0C1B 25431F   15431F  2903          TIBON NOSYNC,L3,TERMSG47 GO IF NO SYNC BYTE FOUND ERROR
0C1C 26121E   18521E  2904          TIBOF READ,CEB2,*+2      GO IF NOT READ -- MUST BE SCAN
0C1D 000D00   000D00  2905      -   B     TERDOECC           GO TO ANALYZE DATA FIELD DATA CHECK
0C1E 200D1F   100D1F  2906          B     TERUNCOR           GO POST UNCORRECTABLE DATA CHECK
0C1F 0EC801   08C801  2907 TERMSG47 ADDI  L8,1               SET MSG TO '47'
0C20 0E5101   09D101  2908          ORI   CEB1,PROCDAT       DONT XFER DATA FIELD
0C21 0EC801   08C801  2909 TERMSG46 ADDI  L8,1               SET MSG TO '46' OR '42'
0C22 0C8845   02C845  2910          TEORI L8,X'45'           GO IF NOT NO
0C23 204C25   110C25  2911          BNZ   TERMSG45                 SYNC BYTE KEY
0C24 0E5102   09D102  2912          ORI   CEB1,PROCKEY       DONT XFER KEY FIELD
0C25 0EC801   08C801  2913 TERMSG45 ADDI  L8,1               SET MSG TO '45' OR '41'
0C26 26122B   18522B  2914          TIBOF READ,CEB2,TERL704  GO IF NOT READ OP
0C27 07CD2A   0F4D2A  2915          TBOFF 7,RBYT,TERNSCNT    GO IF NOT READ HA UP
0C28 2E09F7   18C9F7  2916          ANDI  GEN1,FF-XFRDDDF    DONT XFER RO COUNT FIELD IN DDDF
0C29 200C2B   100C2B  2917          B     TERL704            CONTINUE
0C2A 2E09EF   18C9EF  2918 TERNSCNT ANDI  GEN1,FF-XFRHACNT   DONT XFER COUNT FIELD
0C2B 2A0704   188704  2919 TERL704  LBI   L7,X'04'           POST UNCORRECTABLE DATA CHECK
0C2C 201908   101908  2920          B     TSNNORM            GO TO ERROR ROUTINE
0C2D 0C0310   00C310  2921 TERCNT   TANDI L3,DATACHK         GO IF COUNT FIELD
0C2E 004C33   010C33  2922          BNZ   TERCHKIG                      DATA CHECK
0C2F 058333   064333  2923          TIBON DATAFND,L3,TERCHKIG GO IF DATA FOUND
                      2924 *   NO SYNC BYTE FOUND AND NO DATA FOUND FOR COUNT FIELD OP
0C30 25D233   175233  2925          TBON  7,CEB2,TERCHKIG    GO IF END OF RO COUNT FIELD
0C31 0003E0   0003E0  2926          BU    TDXWADEX           GO WAIT FOR INDEX
0C32 00040A   00040A  2927 TERDOIDX B     TDXINDEX           GO TO INDEX PROCESSING
                      2928 *
                      2929 *   COME HERE TO CHECK IF COUNT FIELD DATA CHECK TO BE IGNORED
                      2930 *
0C33 265225   195225  2931 TERCHKIG TIBOF SRCH,CEB2,TERMSG45  GO POST ERROR IF NOT SEARCHING
0C34 061225   085225  2932          TIBOF READ,CEB2,TERMSG45 GO POST ERROR IF NOT READ CMD
0C35 0C8D02   02CD02  2933          TEORI RBYT,X'02'         GO POST ERROR IF
0C36 204C25   110C25  2934          BNZ   TERMSG45                 NOT RD CKD CMD
0C37 2E4D80   19CD80  2935          ORI   RBYT,X'80'         TURN ON IGNORE CNT DATA CHECK MARK
0C38 2E2701   18E701  2936          ANDI  FHF,ENDFILEX       RST FILE XFER
0C39 201580   101580  2937          BU    TRDOPDWN           DO OPERATE DOWN--RST READ/WRITE
0C3A 200780   100780  2938          BU    TEFSETRW           SET READ/WRITE AGAIN TO RST DATA CHK
0C3B 2E12F8   18D2F8  2939          ANDI  CEB2,X'F8'         SET TRK ORIENTATION TO END OF HA
0C3C 201436   101436  2940          B     TRDDGN             GO READ HA ON ACTIVE TRACK
                      2941 ************************************************************
                      2942 *   COME HERE TO POST PA MISCOMPARE IN HOME ADDRESS FIELD
                      2943 ************************************************************
0C3D 2A081A   18881A  2944 TERPACHK LBI   L8,X'1A'          POST PA CHECK
0C3E 0011F4   0011F4  2945          BU    TIPBSGEN           GENERATE BSDA
0C3F 2A071F   18871F  2946          LBI   L7,D(SKMARK1)      FETCH SEEK IN-
0C40 2407C6   1047C6  2947          LINC  L6,L7,0                  COMPLETE MARKS
0C41 0F4642   0DC642  2948          OR    L6,L2              POST SEEK INCOMPLETE FOR THIS DRV
0C42 040786   004786  2949          SINC  L6,L7,0            RESTORE MARKS
0C43 2A0707   188707  2950 TERL707  LBI   L7,X'07'          POST SEEK CHECK
0C44 201908   101908  2951          B     TSNNORM            GO TO ERROR SENSE ROUTINE
                      2952 *
                      2953 ************************************************************
                      2954 *    THIS IS THE INLINE SCAN HARDWARE DIAGNOSTIC WHICH IS EXECUTED
                      2955 *      FOLLOWING ACCEPTANCE OF AN SIO SCAN READ OR COMMAND
                      2956 ************************************************************
                      2957 *
0C45 100011   100011  2958 TERTABLE DW    X'0011'            THIS IS
0C46 10FF00   10FF00  2959          DW    X'FF00'              THE DATA
0C47 10FF11   10FF11  2960          DW    X'FF11'                IN CONTROL STORE
0C48 1000FF   1000FF  2961          DW    X'00FF'                  WHICH THIS
0C49 101100   101100  2962          DW    X'1100'                    TEST
0C4A 100000   100000  2963          DW    X'0000'                      ACCESSES
                      2964 *
0C4B 089E8C   029E8C  2965 TERSTART SABI  BLOCKCH,B(TERTABLE+X'8000')  BLOCK ADDRESS OF TABLE
0C4C 28BE45   12BE45  2966          SADI  DISPCH,D(TERTABLE)  DISP OF TABLE
0C4D 28D7CE   1397CE  2967          SZI   ZLSCH,ZLSWFILE     SELECT FBO FOR TRAP C'S
0C4E 2A3300   188300  2968          LBI   DXC,X'00'           TURN OFF CHANNEL CONTROL BITS
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0C4F 0E6F88  09EF88  2969          ORI   SCN,SCANRD+ALWFXFR  SET SCAN READ OR AND ALLOW FILE XFR
0C50 0A360D  08860D  2970          LBI   FCT,X'0D'           SET FCT FOR END OF FILE XFR ON TST 4
0C51 220C51  180C51  2971          NOP   *                   ALLOW TIME FOR 2 TRAPS
0C52 220C52  180C52  2972          NOP   *                     TO COMPLETE
0C53 2E6504  19E504  2973          ORI   FTG,FOTOFI          GATE FO TO FI
0C54 2E6510  19E510  2974          ORI   FTG,X'10'           COPY FO
0C55 2E2544  18E544  2975          ANDI  FTG,X'44'             TO FI
0C56 200CFA  100CFA  2976 TERTEST1 BU    TERSYNC             SYNC IN FOR ID BYTE, NO TRAPS TAKEN
0C57 200CFA  100CFA  2977          BU    TERSYNC             SYNC IN, 'FF'->FBO
0C58 200CFA  100CFA  2978          BU    TERSYNC             SYNC IN, '00'->FBO, DETECT 'FF'
0C59 2C2706  10E706  2979          TANDI FHF,X'06'           SCAN SATISFIED AND SCAN EQUAL
0C5A 224C60  190C60  2980          BZ    TERTEST2              SHOULD BOTH BE OFF
0C5B 0A0828  088828  2981 TERL828 LBI   L8,X'28'            ERROR-- SCAN COMPARE FAILURE
0C5C 0E2540  08E540  2982          ANDI  FTG,X'40'           TURN OFF DIAGNUSTIC BITS IN FTG
0C5D 0A2F00  08AF00  2983          LBI   SCN,X'00'           TURN OFF SCAN AND FILE CONTROLS
0C5F 2E6705  19E705  2984          ORI   FHF,SCNSAT+ENDFILEX RESET SCAN AND END OF FILE XFR
0C5F 201E44  101E44  2985          B     TWRFMT2E            GO TO POST FMT 2, MSG 8 ERROR
0C60 200CFA  100CFA  2986 TERTEST2 BU    TERSYNC             SYNC IN, 'FF'->FBO, SCAN HIT & EQUAL
0C61 200CFA  100CFA  2987          BU    TERSYNC             SYNC IN, DETECT 'FF', SET FHF 5 & 6
0C62 07675B  0D675B  2988          TIBOF SCNSAT,FHF,TERL828  SCAN SATISFIED SHOULD BE ON
0C63 07A75B  0E675B  2989          TIBOF SCNEQ,FHF,TERL828   SCAN EQUAL SHOULD BE ON
0C64 2A0801  188801  2990          LBI   L8,1                SET MARK TO EXECUTE TEST 3
0C65 0E2F7F  08EF7F  2991 TERTST34 ANDI  SCN,X'7F'           RESET SCAN READ CONTROL BIT
0C66 0E6704  09E704  2992          ORI   FHF,SCNSAT          RESET SCAN SAT AND EQUAL BITS
0C67 0E6FC0  09EFC0  2993          ORI   SCN,SCANRD+SCANHI   TURN ON SCAN RD OR AND SCAN HI BITS
0C68 200CFA  100CFA  2994          BU    TERSYNC             SYNC IN, TRANSFER '11' TO FO
0C69 2E6510  19E510  2995          ORI   FTG,X'10'           GATE FO
0C6A 2E2544  18E544  2996          ANDI  FTG,X'44'             TO FI
0C6B 0E2F7F  08EF7F  2997          ANDI  SCN,X'7F'           RESET SCAN READ CONTROL BIT
0C6C 0E6704  09E704  2998          ORI   FHF,SCNSAT          RESET SCAN SAT AND EQUAL BITS
0C6D 0E6FC0  09EFC0  2999          ORI   SCN,SCANRD+SCANHI   TURN ON SCAN RD OR AND SCAN HI BITS
0C6E 200CFA  100CFA  3000          BU    TERSYNC             SYNC IN, '00'->FBO
0C6F 200CFA  100CFA  3001          BU    TERSYNC             SYNC IN, 'FF'->FBO(3), '00'->FBO(4)
0C70 200CFA  100CFA  3002          BU    TERSYNC             SYNC IN,'FF' DETECT,SCN SAT,NOT EQ(3)
                     3003 *                                    END OF FILE XFR, SCAN SAT,NOT EQ(4)
0C71 07675B  0D675B  3004          TIBOF SCNSAT,FHF,TERL828  GO IF SCAN SATISFIED IS OFF
0C72 25A75B  16675B  3005          TIBON SCNEQ,FHF,TERL828   GO IF SCAN EQUAL IS ON
0C73 07C876  0F4876  3006          TBOFF 7,L8,TEROUT         GO IF TEST 4 JUST EXECUTED
0C74 0A0800  088800  3007          LBI   L8,0                RESET TEST 3 MARK
0C75 200C65  100C65  3008          B     TERTST34            GO EXECUTE TEST 4
0C76 0A2F00  08AF00  3009 TEROUT   LBI   SCN,X'00'           RESET SCAN CONTROLS
0C77 2E6705  19E705  3010          ORI   FHF,SCNSAT+ENDFILEX RESET SCAN AND END OF FILE XFR
0C78 2A2540  18A540  3011          LBI   FTG,X'40'           RESET DIAGNOSTIC CONTROL BITS
0C79 001600  001600  3012          B     TSCOR               PROCEED TO COMMAND BREAK OUT
                     3013 *
                     3014 *    DIAGNOSTIC SYNC IN SUBROUTINE FOR ABOVE TEST
                     3015 *
0C7A 2E6502  19E502  3016 TERSYNC  ORI   FTG,DSYNCIN         RAISE DIAGNOSTIC SYNC IN
0C7B 020C7B  080C7B  3017          NOP   *                   ALLOW TIME FOR TRAP TO OCCUR
0C7C 0F90D0  0ED0D0  3018          EORU  ZER,ZER             RETURN
                     3019          MBLOK
0C7D 200C7D  100C7D  3020+         B     *                   UNUSED  ::::::::::::
0C7E 200C7E  100C7E  3021+         B     *                   UNUSED  ::::::::::::
0C7F 000C7F  000C7F  3022+         B     *                   UNUSED  ::::::::::::
0D00                 3023+         DS    <0>B
                     3024 *
                     3025 ********************************************************************
                     3026 *   E R R O R   C O R R E C T I O N   C O D E   A N A L Y S I S
                     3027 *              ********************************
                     3028 *    REGISTER USAGE IN ROUTINE   /    EXIT REGISTERS IF CORRECTABLE
                     3029 *  L0 : DISPLACEMENT HIGH        /  L0 : DISPLACEMENT HIGH
                     3030 *  L1 : DISPLACEMENT LOW         /  L1 : DISPLACEMENT LOW
                     3031 *  L2 : DATA LENGTH HIGH         /  L2 : ---
                     3032 *  L3 : DATA LENGTH LOW          /  L3 : ---
                     3033 *  L4 : HIGH PATTERN             /  L4 : HIGH PATTERN
                     3034 *  L5 : LOW PATTERN              /  L5 : LOW PATTERN
                     3035 *  L6 : RESIDUAL COUNT HIGH      /  L6 : ---
                     3036 *  L7 : RESIDUAL COUNT LOW       /  L7 : SENSE BYTES 0-2
                     3037 *  L8 : TIMER                    /  L8 : ERROR FORMAT & MESSAGE
                     3038 ********************************************************************
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                     3039 *
0D00 0E2F40  08EF40  3040 TERDOECC ANDI  SCN,X'40'           RESET FILE XFER CONTROLS
0D01 2E33FB  18F3FB  3041          ANDI  DXC,FF-ALOWFILE     RESET ALLOW DIFF CNTR FILE
0D02 2E6F01  19EF01  3042          ORI   SCN,NFILEXFR        SET INHIBIT FILE TO CS XFER
0D03 2E2701  18E701  3043          ANDI  FHF,ENDFILEX        RESET END OF FILE XFER
0D04 2E2DFE  18EDFE  3044          ANDI  FTR,FF-ALLOWIDX     RESET ALLOW INDEX
0D05 0E6F0A  09EF0A  3045          ORI   SCN,ALWFXFR+TOFILE  SET ALLOW FILE XFER AND WRITE MODE
0D06 2A0622  188622  3046          LBI   L6,X'22'            LOAD HIGH COUNT
0D07 2A2E06  18AE06  3047          LBI   FBO,X'06'           LOAD FBO WITH MOD 16 COUNT
0D08 2A2608  18A608  3048          LBI   FTO,ECCCNTL         SET ECC CONTROL TAG
0D09 2A3655  18B655  3049          LBI   FCT,X'55'           LOAD FILE CNTR (TOTAL=8790=X'2256')
0D0A 0E2FFD  08EFFD  3050          ANDI  SCN,FF-TOFILE       RESET WRITE MODE
0D0B 000781  000781  3051          BU    TEFTGVAL            GO RAISE TAG GATE
0D0C 2E6520  19E520  3052          ORI   FTG,FORCERYC         RAISE FORCE RECYCLE
0D0D 0E6D01  09ED01  3053          ORI   FTR,ALLOWIDX         TURN ON ALLOW INDEX
0D0E 0A0700  088700  3054          LBI   L7,0                SET TIMER TO WAIT FOR OP COMPLETE
0D0F 058521  067521  3055 TERECCLP TIBON INDEX,FTI,TERCORR   GO IF INDEX ALERT
0D10 05351C  04751C  3056          TIBON NORMEND,FTI,TERNORME GO IF NORMAL END
0D11 05E716  076716  3057          TIBON ENDFILEX,FHF,TERFCTO GO IF FILE COUNTER IS ZERO
0D12 0EC801  0BC801  3058          ADDI  L8,1                INCR TIMER
0D13 0F4710  0DC710  3059          ADDC  L7,ZER                 ''
0D14 028D0F  0A0D0F  3060          BNC   TERECCLP            CONTINUE WAITING IF NO TIME OUT
0D15 20072A  10072A  3061          B     TEFNOREP            GO POST NO RESPONSE ERROR
                     3062 *
                     3063 *   FILE COUNTER REACHES ZERO
                     3064 *
0D16 2E2701  18E701  3065 TERFCTO  ANDI  FHF,ENDFILEX         RESET END FILE XFER LATCH
0D17 05351C  04751C  3066          TIBON NORMEND,FTI,TERNORME  GO IF NORMAL END REACHED
0D18 0EC6FF  0BC6FF  3067          ADDI  L6,-1               DECREMENT HIGH COUNTER
0D19 204D0F  110D0F  3068          BNZ   TERECCLP            CONTINUE WAIT
0D1A 0E25DF  08E5DF  3069          ANDI  FTG,FF-FORCERYC     TURN OFF FORCE RECYCLE
0D1B 000D0F  000D0F  3070          B     TERECCLP            CONTINUE WAIT
                     3071 *
                     3072 *   NORMAL END DETECTED
                     3073 *
0D1C 00158D  00158D  3074 TERNORME BU    TRDRDFBI            GATE FI  TO FBI
0D1D 20099A  10099A  3075          BU    TEFRESP             RESPONSE TO FILE
0D1E 25E25A  17625A  3076          TBON  7,FBI,TERZPATN      GO IF ZEROS DETECTED -- CORRECTABLE
0D1F 2A0843  188843  3077 TERUNCOR LBI   L8,X'43'            POST UNCORRECTABLE DATA CHECK MSG
0D20 200C2B  100C2B  3078          B     TERL704             GO POST DATA CHECK
                     3079 *
                     3080 *   INDEX DETECTED -- DATA CHECK MAY BE CORRECTABLE
                     3081 *
0D21 0A0700  088700  3082 TERCORR  LBI   L7,0                INITIALIZE LOW RESIDUAL COUNT
0D22 05E72A  07672A  3083 TERRSCNT TIBON ENDFILEX,FHF,TERLOWCT  GO IF LOW COUNT GENERATION DONE
0D23 0EC701  0BC701  3084          ADDI  L7,1                INCR COUNT
0D24 028D27  0A0D27  3085          BNC   TERSKPA             GO IF NO CARRY
0D25 2A0823  188823  3086          LBI   L8,X'23'            POST ERROR - NO END OF FILE XFER
0D26 201E44  101E44  3087          B     TWRFMT2E            POST EQUIPMENT CHECK
0D27 2E6502  19E502  3088 TERSKPA  ORI   FTG,X'02'           RAISE AND DROP DIAG SYNC IN
0D28 0E25FD  08E5FD  3089          ANDI  FTG,X'FD'              TO DECREMENT PCT BY ONE
0D29 000D22  000D22  3090          B     TERRSCNT            GO CHECK FOR END OF FILE XFER LATCH
0D2A 0E2F40  08EF40  3091 TERLOWCT ANDI  SCN,X'40'           RESET FILE XFER CONTROLS
0D2B 0E25DF  08E5DF  3092          ANDI  FTG,FF-FORCERYC     TURN OFF FORCE RECYCLE
0D2C 2A2604  18A604  3093          LBI   FTO,RDERROR         SET READ ERROR/ECC TAG
0D2D 0A2E02  08AE02  3094          LBI   FBO,CTLRERR1        READ CONTROLLER ERROR TAG MODIFIER
0D2E 201583  101583  3095          BU    TRDSBTIM            GO TO TAG SUBROUTINE
0D2F 05E232  076232  3096          TBON  7,FBI,**3           GO IF ZEROS DETECTED
0D30 0A0405  088405  3097 TERECCHK LBI   L4,X'05'            SENSE BYTE 18=ECC HARDWARE CHECK
0D31 200707  100707  3098          B     TEFNRERR            GO POST UPGM DETECTED ERROR
0D32 0A2E80  08AE80  3099          LBI   FBO,ECCLOW          RD ECC LOW TAG MODIFIER
0D33 201583  101583  3100          BU    TRDSBTIM            TAG SUBROUTINE
0D34 080522  0C8522  3101          MV    L5,FBI              SAVE LOW PATTERN BYTE
0D35 0A2E40  08AE40  3102          LBI   FBO,ECCHI           RD ECC HIGH TAG MODIFIER
0D36 201583  101583  3103          BU    TRDSBTIM            TAG SUBROUTINE
0D37 280422  1C8422  3104          MV    L4,FBI              SAVE HIGH PATTERN BYTE
0D38 2D4445  15C445  3105          TOR   L4,L5               CHECK FOR ZERO PATTERN BYTES
0D39 024D30  090D30  3106          BZ    TERECCHK            GO IF PATTERN BYTES ARE ZERO
0D3A 280214  1C8214  3107          MV    L2,MSC2             COPY HIGH
0D3B 0E0201  08C201  3108          ANDI  L2,1                   DATA LENGTH
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0D3C 0B0318  0C8318  3109          MV    L3,DCNT          COPY LOW DATA LENGTH
0D3D 2B0002  1C8002  3110          MV    L0,L2            SET DISPLACEMENT
0D3E 2B0103  1C8103  3111          MV    L1,L3                EQUAL TO DATA LENGTH
0D3F 2EC307  1BC307  3112          ADDI  L3,7               <
0D40 0F4210  0DC210  3113          ADDC  L2,ZER           <   IF RESIDUAL COUNT IS
0D41 2E83FF  1AC3FF  3114          EORI  L3,FF            <    GREATER THAN OR EQUAL
0D42 0E82FF  0AC2FF  3115          EORI  L2,FF            <    TO DATA LENGTH + 6(ECC),
0D43 0FC307  0FC307  3116          ADD1  L3,L7            <    THEN THE DATA CHECK
0D44 2F4206  1DC206  3117          ADDC  L2,L6              <  IS UNCORRECTABLE
0D45 008D1F  020D1F  3118          BCY   TERUNCOR             <
0D46 2EC301  1BC301  3119          ADDI  L3,1           GO IF RESIDUAL COUNT
0D47 0F4210  0DC210  3120          ADDC  L2,ZER             NOT EQUAL TO
0D48 204D4E  110D4E  3121          BNZ   TERDISPL               (DATA LENGTH + 6) - 1
0D49 04C41F  03441F  3122          TBON  3,L4,TERUNCOR  GO IF HIGH PATTERN NOT ZERO (UNCORR)
0D4A 0B0804  0C8804  3123          MV    L8,L4          REVERSE
0D4B 2B0405  1C8405  3124          MV    L4,L5            HIGH AND LOW
0D4C 2B0508  1C8508  3125          MV    L5,L8                PATTERN BYTES
0D4D 200D5E  100D5E  3126          B     TERSET53       GO POST CORRECTABLE DATA CHK MSG
0D4E 2A00FF  1880FF  3127 TERDISPL LBI   L0,FF          SUBTRACT 7
0D4F 2EC7F9  1BC7F9  3128          ADDI  L7,-7              FROM
0D50 0F4600  0DC600  3129          ADDC  L6,L0                RESIDUAL COUNT
0D51 2A0102  188102  3130          LBI   L1,2           PRESET
0D52 2A0000  188000  3131          LBI   L0,0             DISPLACEMENT BYTES
0D53 2F0107  1CC107  3132          ADD   L1,L7              TO RESIDUAL CNT
0D54 0F4006  0DC006  3133          ADDC  L0,L6                  MINUS 5
0D55 06065E  08465E  3134          TBOFF 0,L6,TERSET53  GO IF COUNT >= 7  (CORRECTABLE)
0D56 0EC701  08C701  3135          ADDI  L7,1           GO ZERO PATTERN BYTES
0D57 2F4610  1DC610  3136          ADDC  L6,ZER             IF COUNT IS LESS
0D58 028D5A  0A0D5A  3137          BNC   TERZPATN               THAN (ECC-1)
0D59 04C45D  03445D  3138          TBON  3,L4,TERZLWP   GO ZERO LOW PATTERN IF HI PATN ¬= 0
0D5A 2B0010  1C8010  3139 TERZPATN MV    L0,ZER         ZERO HIGH DISPLACEMENT
0D5B 0B0110  0C8110  3140          MV    L1,ZER         ZERO LOW DISPLACEMENT
0D5C 0B0410  0C8410  3141          MV    L4,ZER         ZERO HIGH PATTERN
0D5D 2B0510  1C8510  3142 TERZLWP  MV    L5,ZER         ZERO LOW PATTERN
0D5E 2C8D03  12CD03  3143 TERSET53 TEORI RBYT,X'03'      SEE IF RD VERIFY K-D CMD
0D5F 224D1F  190D1F  3144          BZ    TERUNCOR       GO IF YES (CHK IS UNCORRECTABLE)
0D60 0A0853  088853  3145          LBI   L8,X'53'       POST CORRECTABLE DATA CHECK MSG
0D61 0A0724  088724  3146 TERL724  LBI   L7,X'24'       SET DATA CHECK AND CORRECTABLE MARK
0D62 201908  101908  3147          B     TSNNORM        GO TO ERROR ROUTINE
0D63 2CD8F5  13D8F5  3148 TERALTRK TADDI HEAD,-11       CHECK FOR 3340  LOGICAL BOUNDARY
0D64 004D6E  010D6E  3149          BNZ   TERINCHH       GO IF NOT
0D65 2A1800  189800  3150          LBI   HEAD,0         SET HEAD VALUE TO ZERO
0D66 2BD701  1BD701  3151          ADDI  CLO,1          INCR 3340 LOGICAL  CYLINDER
0D67 0F5610  0DD610  3152          ADDC  CHI,ZER              ADDRESS BY ONE
0D68 2A0003  188003  3153          LBI   L0,D(DDCFORGL+3)  POINT TO CLO IN DDCF
0D69 0A0182  088182  3154          LBI   L1,D(DDCFORGR+2)  POINT TO CHI IN DDCF
0D6A 044097  014097  3155          SINC  CLO,L0,1         STORE NEW CLO IN DDCF
0D6B 240098  104098  3156          SINC  HEAD,L0,0        STORE NEW H(LO) IN DDCF
0D6C 240196  104196  3157          SINC  CHI,L1,0         STORE NEW CHI IN DDCF
0D6D 200467  100467  3158          B     TDXL746          GO TO CONTINUE ALT TRK HANDLING
0D6E 2ED801  18D801  3159 TERINCHH ADDI  HEAD,1          INCREMENT HEAD VALUE BY 1
0D6F 0A0004  088004  3160          LBI   L0,D(DDCFORGL+4)  POINT TO H(LO) IN DDCF
0D70 240098  104098  3161          SINC  HEAD,L0,0        STORE NEW H(LO) IN DDCF
0D71 200467  100467  3162          B     TDXL746          GO TO CONTINUE ALT TRK HANDLING
0D72 24A376  126376  3163 TERINCDR TIBON ENDCHXFR,DST,*+4  GO IF END OF CHAN XFER IS ON
0D73 0A2300  08A300  3164          LBI   DST,0            RESET DST REGISTER
0D74 0011CB  0011CB  3165          BU    TIORDDDR         GO HANDLE DDDR UPDATE
0D75 000A1C  000A1C  3166          B     TENDDDR          GO FINISH COMMAND
0D76 000A1A  000A1A  3167          B     TENCHK           GO FINISH COMMAND
                     3168 *
                     3169 *    OFFLOAD SD DURING HA OR CNT OP
                     3170 *
0D77 2440DD  1140DD  3171 TERGETSD LINC  SDH,L0,1         FETCH SDH
0D78 220D78  180D78  3172          NOP   *                DELAY
0D79 0441DE  0141DE  3173          LINC  SDL,L1,1         FETCH SDL
0D7A 000733  000733  3174          B     TEFPAC           GO TO FETCH PAC AND PAH
                     3175          MBLOK
0D7B 000D7B  000D7B  3176+         B     *                UNUSED  ::::::::::
0D7C 200D7C  100D7C  3177+         B     *                UNUSED  ::::::::::
0D7D 000D7D  000D7D  3178+         B     *                UNUSED  ::::::::::
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0D7E 000D7E  000D7E  3179+         B     *                UNUSED  ::::::::::
0D7F 200D7F  100D7F  3180+         B     *                UNUSED  ::::::::::
0E00                 3181+         DS    <0>B
                     3182          END COPY-MEMBER TER
                     3183     COPY      TFE
                     3184 *-------------------------------------------------------*
                     3185 *                                                       *
                     3186 *       TFE -- FORCE ERROR ROUTINE (ALIAS 'DIAL-A-BUG') *
                     3187 *                                                       *
                     3188 *       CALLING PREREQUISITES:                          *
                     3189 *                                                       *
                     3190 *            FEB -- FORCE ERROR BUFFER (16 BYTES)       *
                     3191 *                 BYTES 0 & 1 = VALIDITY FLAG (VALID=X'FFFF')  *
                     3192 *                 BYTES 2 & 3 = Q AND R BYTES OF SIO COMMAND CODE  *
                     3193 *                       BYTE 4 = BYTE 0 OF DIAGNOSTIC SENSE BUFFER  *
                     3194 *                       BYTE 5 = BYTE 1 OF DIAGNOSTIC SENSE BUFFER  *
                     3195 *                       BYTE 6 = BYTE 2 OF DIAGNOSTIC SENSE BUFFER  *
                     3196 *                       BYTE 7 = BYTE 7 OF DIAGNOSTIC SENSE BUFFER  *
                     3197 *                       BYTE 8 = BYTE 18 OF DIAGNOSTIC SENSE BUFFER  *
                     3198 *                       BYTES 9 THRU 15 ARE RESERVED    *
                     3199 *                                                       *
                     3200 *-------------------------------------------------------*
0E00 00              3201 FEBJUNK  DC    X'00'
0E01 00              3202 FEB      DC    5X'00'           FORCE ERROR BUFFER
0E01                 3203 FEBL     EQU   FEB                LEFT HALF
0E81                 3204 FEBR     EQU   FEB+X'80'          RIGHT HALF
0080                 3205 FEBADD1  EQU   X'80'           ADDRESS OF FEB IN S/3 (HIGH BYTE)
0000                 3206 FEBADD2  EQU   X'00'           ADDRESS OF FEB IN S/3 (LOW BYTE)
                     3207 *
                     3208 *       ENTRY POINT FROM TIO ROUTINE
                     3209 *
0E06 0011CB  0011CB  3210 TFETIO   BU    TIORDDDR         READ DDDR INTO L2 & L3
0E07 0A0602  088602  3211          LBI   L6,SUBTRACT      SET SUBTRACT FLAG
0E08 0EC300  0BC300  3212          ADDI  L3,-FEBADD2      COMPUTE DIFFERENCE
0E09 0F4210  0DC210  3213          ADDC  L2,ZER               BETWEEN OLD DDDR
0E0A 2EC250  1BC250  3214          ADDI  L2,-FEBADD1              AND NEW DDDR
0E0B 208E11  120E11  3215          BCY   *+6              IF OLD > NEW SKIP 5 INSTRUCTIONS
0E0C 0E8602  0AC602  3216          EORI  L6,SUBTRACT      RESET SUBTRACT FLAG
0E0D 2E83FF  1AC3FF  3217          EORI  L3,FF            COMPLEMENT AND
0E0E 0E82FF  0AC2FF  3218          EORI  L2,FF                INCREMENT
0E0F 2EC301  1BC301  3219          ADDI  L3,1                     THE VALUE IN
0E10 0F4210  0DC210  3220          ADDC  L2,ZER                       L2 & L3
0E11 0B0402  0C8402  3221          MV    L4,L2            SAVE THE DIFFERENCE IN
0E12 0B0503  0C8503  3222          MV    L5,L3                L2 & L3
0E13 200EEC  100EEC  3223          BU    TFESETUP         SETUP B00, CIO AND DXC
0E14 0011CD  0011CD  3224          BU    TIOUDDDR         UPDATE DDDR TO NEW VALUE
0E15 0E8602  0AC602  3225          EORI  L6,SUBTRACT      TOGGLE SUBTRACT FLAG
0E16 2A2100  18A100  3226          LBI   CCH,0            SETUP CHANNEL COUNTER
0E17 2A3108  188108  3227          LBI   CCL,8                FOR 10 BYTE XFER
0E18 289E8E  129E8E  3228          SABI  BLOCKCH,B(FEB+X'8000') SETUP CHANNEL FOR
0E19 088E00  028E00  3229          SADI  DISPCH,D(FEBJUNK)    MULTIPLE BYTE FETCH
0E1A 28D75B  13975B  3230          SZI   ZLSCH,ZLSFCHAN           FROM FEB IN S/3
0E1B 0A3310  08B310  3231          LBI   DXC,LSRSELDR                 TO FEB IN IOP
0E1C 0A073C  08873C  3232          LBI   L7,D(TIOTFEA1)    SETUP RETURN POINTER
0E1D 00101E  00101E  3233          B     TIOCHXFR         FETCH FEB FROM S/3
0E1E 0A3D09  08BD09  3234 TFETIOB1 LBI   B00,09           SETUP B00 AND CIO
0E1F 0E2340  08E340  3235          ANDI  DST,CHOUTVAL         TO UPDATE DDDR
0E20 0A3D00  08BD00  3236          LBI   B00,0                TO FEB (IN S/3)
0E21 0A3302  08B302  3237          LBI   DXC,SUBTRACT     SET SUBTRACT FLAG
0E22 0011CD  0011CD  3238          BU    TIOUDDDR         RESTORE DDDR TO FEB (IN S/3)
0E23 289A0E  129A0E  3239          SABI  BLOCKB,B(FEB)    SET BASE BLOCK ADDRESS TO FEB
0E24 2A0701  188701  3240          LBI   L7,D(FEBL)       SET DISPLACEMENT ADDRESSES
0E25 0A0881  088881  3241          LBI   L8,D(FEBR)           IN L0 AND L1 FOR FEB
0E26 2447C2  1147C2  3242          LINC  L2,L7,1          LOAD VALIDITY BYTES
0E27 0448C3  0148C3  3243          LINC  L3,L8,1              IN L2 AND L3
0E28 2C82FF  12C2FF  3244          TEORI L2,FF            IF L2 IS NOT X'FF'
0E29 004E70  010E70  3245          BNZ   TFETIORS             THEN RETURN TO TIO
0E2A 0C83FF  02C3FF  3246          TEORI L3,FF            IF L3 IS NOT X'FF'
0E2B 004E70  010E70  3247          BNZ   TFETIORS             THEN RETURN TO TIO
0E2C 2447C2  1147C2  3248          LINC  L2,L7,1          LOAD Q AND R BYTES
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0E2D 0448C3  0148C3  3249          LINC  L3,L8,1            IN L2 AND L3
0E2E 2C82FF  12C2FF  3250          TEORI L2,FF           COMPARE Q AND X'FF'
0E2F 004E32  010E32  3251          BNZ   *+3                SKIP IF Q IS NOT X'FF'
0E30 0C83FF  02C3FF  3252          TEORI L3,FF           COMPARE R AND X'FF'
0E31 224E75  190E75  3253          BZ    TFECHECK           GO IF Q AND R ARE X'FF'
0E32 2D824C  16C24C  3254          TEOR  L2,QBYT         COMPARE CURRENT Q BYTE WITH FEB
0E33 204E71  110E71  3255          BNZ   TFETIORT         IF NOT EQUAL RETURN TO TIO
0E34 2D834D  16C34D  3256          TEOR  L3,RBYT         COMPARE CURRENT R BYTE WITH FEb
0E35 204E71  110E71  3257          BNZ   TFETIORT         IF NOT EQUAL RETURN TO TIO
0E36 2E2720  18E720  3258          ANDI  FHF,ERRMODE      RESET FORCE ERROR MODE FLAG
0E37 04A74A  02674A  3259          TIBON ERRMODE,FHF,TFESKIP IF PERMANENT ERROR GO TO TFESKIP
0E38 2A0701  188701  3260          LBI   L7,D(FEBL)       RESET DISPLACEMENT ADDRESSES
0E39 0A0881  088881  3261          LBI   L8,D(FEBR)          IN L0 AND L1
0E3A 048790  024790  3262          SINC  ZER,L7,2         SET VALIDITY BYTES
0E3B 048890  024890  3263          SINC  ZER,L8,2            TO ZERO
0E3C 2A2100  18A100  3264          LBI   CCH,0            SET CHANNEL COUNTER
0E3D 0A3100  088100  3265          LBI   CCL,0               FOR 2 BYTE XFER
0E3E 289E8E  129E8E  3266          SABI  BLOCKCH,B(FEB+X'8000') SETUP CHANNEL FOR
0E3F 286E01  12BE01  3267          SADI  DISPCH,D(FEB)          MULTIPLE BYTE STORE
0E40 08D7DD  0397DD  3268          SZI   ZLSCH,ZLSSCHAN            TO FEB IN S/3
0E41 2A3390  18B390  3269          LBI   DXC,X'90'                  FROM FEB IN IOP
0E42 2A073D  18873D  3270          LBI   L7,D(TIOTFEA2)   SETUP RETURN POINTER
0E43 00101E  00101E  3271          B     TIOCHXFR         STORE VALIDITY BYTES BACK IN S/3
0E44 058648  064648  3272 TFETIOB2 TIBON SUBTRACT,L6,*+4   IF SUBTRACT IS ON SKIP 3
0E45 2EC5FE  1BC5FE  3273          ADDI  L5,-2            DECREMENT DIFFERENCE
0E46 0F4410  0DC410  3274          ADDC  L4,ZER              BETWEEN OLD DDDR AND
0E47 2EC4FF  1BC4FF  3275          ADDI  L4,FF                  NEW DDDR BY 2
0E48 2F0506  1CC506  3276          ADD   L5,L6            INCREMENT DIFFERENCE
0E49 0F4410  0DC410  3277          ADDC  L4,ZER              BY 2 OR ZERO
0E4A 200EEC  100EEC  3278 TFESKIP  BU    TFESETUP         SETUP B00, CIO AND DXC
0E4B 0011CD  0011CD  3279          BU    TIOUDDDR         RESTORE DDDR TO ORIGINAL VALUE
0E4C 2A0303  188303  3280          LBI   L3,D(FEBL+2)      SET DISPLACEMENT TO BYTE 3 OF FEB
0E4D 2443C0  1143C0  3281          LINC  L0,L3,1          LOAD DIAGNOSTIC SENSE BYTE 0 IN L0
0E4E 0443C2  0143C2  3282          LINC  L2,L3,1          LOAD DIAGNOSTIC SENSE BYTE 2 IN L2
0E4F 2403C4  1043C4  3283          LINC  L4,L3,0          LOAD DIAGNOSTIC SENSE BYTE 18 IN L4
0E50 0A0383  088383  3284          LBI   L3,D(FEBR+2)     SET DISPLACEMENT TO BYTE 4 OF FEb
0E51 0443C1  0143C1  3285          LINC  L1,L3,1          LOAD DIAGNOSTIC SENSE BYTE 1 IN L1
0E52 0443C8  0143C8  3286          LINC  L8,L3,1          LOAD DIAGNOSTIC SENSE BYTE 7 IN L8
0E53 2F8747  1EC747  3287          EOR   L7,L7            CLEAR L7
0E54 078156  0E4156  3288          TBOFF 6,L1,*+2         SKIP IF NOT WRITE INHIBIT
0E55 2E4780  19C780  3289          ORI   L7,X'80'         SET BIT 0 IN CODE BYTE
0E56 07C158  0F4158  3290          TBOFF 7,L1,*+2         SKIP IF NOT OPERATION INCOMPLETE
0E57 2E4740  19C740  3291          ORI   L7,X'40'         SET BIT 1 IN CODE BYTE
0E58 26425A  19425A  3292          TBOFF 1,L2,*+2         SKIP IF NOT CORRECTABLE
0E59 2E4720  19C720  3293          ORI   L7,X'20'         SET bIT 2 IN CODE bYTE
0E5A 2E01FC  18C1FC  3294          ANDI  L1,X'FC'         RESET WRITE INHIBIT & OP INCOMPLETE
0E5B 0E02FD  08C2FD  3295          ANDI  L2,X'FD'         RESET CORRECTABLE
0E5C 06C05E  0B405E  3296          TBOFF 3,L0,*+2         GO IF L0 = 0
0E5D 200E64  100E64  3297          B     TFECODE          GO FORM BINARY BIT NUMBER
0E5E 26C162  184162  3298          TBOFF 3,L1,*+4         GO IF L1 = 0
0E5F 2B0001  1C8001  3299          MV    L0,L1            MOVE SENSE BYTE TO L0
0E60 2E4710  19C710  3300          ORI   L7,X'10'         SET L7 FOR SENSE BYTE 1
0E61 200E64  100E64  3301          B     TFECODE          GO FORM BINARY CODE
0E62 2B0002  1C8002  3302          MV    L0,L2            MOVE SENSE BYTE TO L0
0E63 0E4718  09C718  3303          ORI   L7,X'18'         SET L7 FOR SENSE BYTE 2
0E64 2A0500  188500  3304 TFECODE  LBI   L5,0             SET BIT COUNT TO 0
0E65 2F0000  1CC000  3305 TFECLOOP ADD   L0,L0            SHIFT 1 BIT TO THE LEFT
0E66 26C069  184069  3306          TBOFF 3,L0,TFECEXIT    EXIT LOOP IF L0 = 0
0E67 2EC501  1BC501  3307          ADDI  L5,1             BUMP COUNT BY 1
0E68 000E65  000E65  3308          B     TFECLOOP         CONTINUE TO LOOP
0E69 0F4745  0DC745  3309 TFECEXIT OR    L7,L5            FORM CODE BYTE
0E6A 089A05  029A05  3310          SABI  BLOCKB,B(DDCFORG) RESTORE BASE BLOCK ADDRESS
0E6B 201908  101908  3311          B     TSNNORM          GO TO TSN
                     3312 *
0E6C 2B3D05  1CBD05  3313 TFESETUP MV    B00,L5           SETUP B00
0E6D 0E2340  08E340  3314          ANDI  DST,CHOUTVAL        AND CIO
0E6E 0B3D04  0CBD04  3315          MV    B00,L4                FOR TIOUDDDR
0E6F 2B3386  1CB386  3316          MVU   DXC,L6           MOVE SUBTRACT FLAG & RETURN
                     3317 *
0E70 2E2720  18E720  3318 TFETIORS ANDI  FHF,ERRMODE      RESET ERROR MODE PRIOR TO RETURN
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0E71 20GEEC  100EEC  3319 TFETIORT BU    TFESETUP         SET UP B00, CIO & DXC
0E72 0C11CD  0011CD  3320          BU    TIOUDDDR         UPDATE DDDR TO ORGINAL VALUE
0E73 089A05  029A05  3321          SABI  BLOCKB,B(DDCFORG) RESTORE BASE BLOCK ADDRESS
0E74 001108  001108  3322          B     TIOTFERT         RETURN TO TIO
                     3323 *
0E75 089A05  029A05  3324 TFECHECK SABI  BLOCKB,B(DDCFORG) RESET BASE BLOCK ADDRESS
0E76 200EEC  100EEC  3325          BU    TFESETUP         SET,UP B00, CIO & DXC
0E77 0011CD  0011CD  3326          BU    TIOUDDDR         RESTORE DDDR TO ORIGINAL VALUE
0E78 0E2380  08E380  3327          ANDI  DST,IOPBUSY      RESET ATTACHMENT BUSY
0E79 2B0037  1C8037  3328          MV    L0,SB1           CAUSE D-REG CHECK & ADAPTER CHECK
0E7A 200E79  100E79  3329          B     *-1                 LOOP TO CHECK
                     3330          MBLOK
0E7B 000E7B  000E7B  3331+         B     *                UNUSED  ::::::::::::
0E7C 200E7C  100E7C  3332+         B     *                UNUSED  ::::::::::::
0E7D 000E7D  000E7D  3333+         B     *                UNUSED  ::::::::::::
0E7E 000E7E  000E7E  3334+         B     *                UNUSED  ::::::::::::
0E7F 200E7F  100E7F  3335+         B     *                UNUSED  ::::::::::::
0F00                 3336+         DS    <0>B
                     3337          END COPY-MEMBER TFE
                     3338      COPY      TIO12
                     3339 *
                     3340 *  THIS SECTION HANDLES START I/O
                     3341 *
0F00 0C0C07  00CC07  3342 TIOSIO   TANDI QBYT,X'07'       CHECK FOR CONTROL TYPE
0F01 004F03  010F03  3343          BNZ   *+2              GO IF NOT
0F02 0A0B09  088B09  3344          LBI   STAT,NOOP+SKCMPL CHANGE STATUS TO NOP AND SEEK CMPL
0F03 0A083C  08883C  3345          LBI   L8,D(D1SENSE)    SET CTL STGE PTR TO DRV 1
0F04 270C07  1C4C07  3346          TBOFF 4,QBYT,TIODRV1   GO IF DRIVE 1                -<GHD>-
0F05 2EC001  1BC001  3347          ADDI  L0,1             INCR TO CORRECT VALUE FOR DRIVE 2 >-
0F06 2EC822  1BC822  3348          ADDI  L8,X'22'         INCR TO CORRECT VALUE FOR DRIVE 2 >-
0F07 0A041E  08841E  3349 TIODRV1  LBI   L4,D(UCWPTR)     GET UCWPTR POINTER              -<GHD>-
0F08 240488  104488  3350          SINC  L8,L4,0          SAVE CURRENT UCW POINTER
0F09 2EC818  1BC818  3351          ADDI  L8,X'18'         POINT TO CURRENT PA
0F0A 2448CE  1148CE  3352          LINC  PAC,L8,1         PUT PAC IN DLS
0F0B 24C8CF  1348CF  3353          LINC  PAH,L8,3         PUT PAH IN DLS
0F0C 0E6D01  09ED01  3354          ORI   FTR,ALLOWIDX     ALLOW INDEX TO CHECK FOR HOT LINE
0F0D 0B1835  0C9835  3355          MV    HEAD,FTI         SAVE FTI TO CHECK FOR HOT LINE LATER
0F0E 0011F8  0011F8  3356          BU    TIPSLECT         GO SELECT DRIVE
0F0F 0B1722  0C9722  3357          MV    CLO,FBI          SAVE 3 OUT OF 6 CODE FOR LATER CHECK
0F10 0A2684  08A684  3358          LBI   FTO,RDSTATUS      TAG IS READ MODULE STATUS
0F11 2013B5  1013B5  3359          BU    TIPNOCHK         TO TAG FLIPPER
0F12 276214  1D6214  3360 TIODMRDY TIBOF ATTN,FBI,TIONOATN GO IF NO ATTN
0F13 001066  001066  3361          B     TIODOATT         GO HANDLE DATA MODULE ATTENTION
0F14 0A2E08  08AE08  3362 TIONOATN LBI   FBO,X'08'        SET EXPECTED STATUS IN FBO
0F15 0011F4  0011F4  3363          BU    TIPBSGEN         GO GENERATE BSDA
0F16 2A071F  18871F  3364          LBI   L7,D(SKMARK1)    GET SEEK IN
0F17 2407C6  1047C6  3365          LINC  L6,L7,0              PROGRESS MARKS
0F18 2EC8E7  1BC8E7  3366          ADDI  L8,X'E7'         POINT TO BYTE 3 IN SENSE
0F19 258C2A  164C2A  3367          TBON  6,QBYT,TIONTSNS  GO IF NOT READ CMD
0F1A 27CC2A  1F4C2A  3368          TBOFF 7,QBYT,TIONTSNS       ''
0F1B 0C8D07  02CD07  3369          TEORI RBYT,X'07'       CK FOR RD DIAG SENSE
0F1C 004F22  010F22  3370          BNZ   TIODIAG          GO IF NOT
0F1D 2E5380  19D380  3371          ORI   MSC1,RDSNS       SET RD DIAG SENSE MARK
0F1E 2D037F  14C37F  3372          TAND  L3,SB0           IS UNIT CHECK ON FOR THIS DRV?
0F1F 224F78  190F78  3373          BZ    TIOBEGIN         GO IF NOT ON (NOOP IS ON IN STAT)
0F20 2A0B10  188B10  3374          LBI   STAT,OPEND       UNIT CHECK ON (NOOP IS OFF IN STAT)
0F21 200F78  100F78  3375          B     TIOBEGIN         SKIP CKING FOR RD DGN SNS CMD
0F22 2C8D05  12CD05  3376 TIODIAG  TEORI RBYT,X'05'       CK FOR RD AND RESET BUFFERED LOG
0F23 204F2A  110F2A  3377          BNZ   TIONTSNS         GO IF NOT
0F24 0D0642  04C642  3378          TAND  L6,L2            CHECK FOR SEEK INCOMPLETE
0F25 204F29  110F29  3379          BNZ   TIOCLEAN         GO IF    SEEK INCOMPLETE
0F26 04488D  01488D  3380          SINC  RBYT,L8,1        STORE R-BYTE
0F27 04088C  00488C  3381          SINC  QBYT,L8,0        STORE Q-BYTE
0F28 200F78  100F78  3382          B     TIOBEGIN         SKIP CKING FOR RD BUF LOG CMD
0F29 20011F  10011F  3383 TIOCLEAN B     TCUSTART         GO TO CLEAN UP TO POST NOP STATUS
                     3384 *
                     3385 *  COME HERE TO HANDLE NONE SENSE TYPE COMMANDS
                     3386 *
0F2A 0D0642  04C642  3387 TIONTSNS TAND  L6,L2            CHECK FOR SEEK INCOMPLETE
0F2B 224F30  190F30  3388          BZ    TIOSKOK          GO IF NOT ON
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0F2C 07CB29  0F4B29  3389          TIBOF SKCMPL,STAT,TIOCLEAN   GO IF NOT CONTROL TYPE--POST NOP
0F2D 26CD29  184D29  3390          TBOFF 3,RBYT,TIOCLEAN        GO IF NOT RECAL--POST NOP
0F2E 0F8642  0EC642  3391          EOR   L6,L2                  RESET SEEK INCOMPLETE
0F2F 040786  004786  3392          SINC  L6,L7,0                RESTORE MARKS
0F30 04488D  01488D  3393 TIOSKOK  SINC  RBYT,L8,1              STORE R-BYTE
0F31 04088C  00488C  3394          SINC  QBYT,L8,0              STORE Q-BYTE
0F32 2A0407  188407  3395          LBI   L4,X'07'               INIT HOT LINE CHECK MSG
0F33 0C18EF  00D8EF  3396          TANDI HEAD,X'EF'             GO IF ANY TAG IN
0F34 004707  010707  3397          BNZ   TEFNRERR                  LINES ARE ON
0F35 26D739  185739  3398          TBOFF 3,CLO,TIOCTROK         GO IF 3 OUT OF 6 CODE ALL ZERO
0F36 0A0406  088406  3399          LBI   L4,X'06'               INIT WRONG CONTROLLER SELECTED MSG
0F37 2C9707  12D707  3400          TEORI CLO,X'07'              GO IF BAD 3 OUT
0F38 004707  010707  3401          BNZ   TEFNRERR                  6 CODE RETURNED
0F39 052246  046246  3402 TIOCTROK TIBON ONLINE,FBI,TIOONLIN    GO IF DEVICE ON LINE
0F3A 0011F4  0011F4  3403          BU    TIPBSGEN               GET BSDA
0F3B 2D0A43  14CA43  3404          TAND  UNCK,L3                CHECK FOR INTERVENTION REQUIRED
0F3C 004F41  010F41  3405          BNZ   TIOATTN                GO IF YES
0F3D 2A0815  188815  3406          LBI   L8,X'15'               INITIAL SELECTION CHECK
0F3E 2F4A43  1DCA43  3407          OR    UNCK,L3                POST INTERVENTION REQ'D
0F3F 2A0701  188701  3408 TIODMER  LBI   L7,X'01'               POST INTV REQ'D
0F40 201908  101908  3409          B     TSNNORM                GO TO ERROR ROUTINE
0F41 0E6D40  09ED40  3410 TIOATTN  GRI   FTR,IOATTN            TURN ON I/O ATTENTION LIGHT
0F42 201385  101385  3411          BU    TIPNOCHK               RAISE AND DROP TAG GATE
0F43 072242  0C6242  3412          TIBOF ONLINE,FBI,*-1         GO IF DRIVE NOT ON LINE
0F44 2E2DBF  18EDBF  3413          ANDI  FTR,FF-IOATTN          TURN OFF I/O ATTENTION LIGHT
0F45 200F12  100F12  3414          B     TIODMRDY               GO HANDLE DM ATTENTION AGAIN
0F46 056248  056248  3415 TIOONLIN TIBON ATTN,FBI,*+2          GO IF DM ATTN STILL ON
0F47 27E24A  1F624A  3416          TBOFF 7,FBI,TIOB570K         GO IF SK COMPLETE IS OFF
0F48 0A040F  08840F  3417          LBI   L4,X'0F'               GO POST UNRESETABLE
0F49 200707  100707  3418          B     TEFNRERR                  INTERRUPT ERROR
0F4A 2CA208  12E208  3419 TIOB570K TEORI FBI,X'08'              GO IF NO INTERFACE CHECK OR
0F4B 224F4E  190F4E  3420          BZ    TIOCKOFF                  DRIVE CHECK
0F4C 2A0815  188815  3421 TIOSELCK LBI   L8,X'15'               INITIAL SELECTION CHECK
0F4D 200708  100708  3422 TIOEQCHK B     TEFL703                GO POST EQUIP CK
0F4E 0D024A  04C24A  3423 TIOCKOFF TAND   L2,UNCK               CHECK FOR COUNTER OVERFLOW
0F4F 024F54  090F54  3424          BZ    TIOINFOK               GO IF NONE
0F50 0F8A42  0ECA42  3425          EOR   UNCK,L2                RESET COUNTER OVERFLOW
0F51 0A0860  088860  3426          LBI   L8,X'60'               POST FORMAT 6
0F52 0A0718  087718  3427 TIOL718  LBI   L7,X'18'               POST ENVIROMENTAL DATA
0F53 201908  101908  3428          B     TSNNORM                GO TO SET UP SENSE
0F54 0D027F  04C27F  3429 TIOINFOK TAND   L2,SBO                TEST FOR SEEK BUSY
0F55 224F59  190F59  3430          BZ    TIOBZOFF               GO IF NOT ON
0F56 05CB5F  074B5F  3431          TIBON SKCMPL,STAT,TIOCKDM       GO IF CONTROL TYPE CMD
0F57 0A0827  088827  3432 TIOL827  LBI   L8,X'27'               POST SEEK BUSY LATCH ERROR
0F58 201E44  101E44  3433          B     TWRFMT2E               GO POST EQUIPMENT CHECK
0F59 27CB5F  1F4B5F  3434 TIGBZOFF TIBOF SKCMPL,STAT,TIOCKDM       GO IF NOT CONTROL TYPE CMD
0F5A 2A0720  188720  3435          LBI   L7,D(SKMARK2)           FETCH SEEK BUSY
0F5B 27C7C6  1F47C6  3436          LDEC  L6,L7,1                   JUST RESET MARK
0F5C 0D0642  04C642  3437          TAND  L6,L2                  CHECK TO SEE IF SK BUSY JUST RESET
0F5D 205C1E  111C1E  3438          BNZ   TWRL802                POST CMD REJECT WITH INVALID SEQ
0F5E 000F57  000F57  3439          B     TIOL827                POST EQUIPMENT CHECK OTHERWISE
0F5F 2A2604  18A604  3440 TIOCKDM  LBI   FTO,X'04'              SET READ PHYSICAL
0F60 0A2E10  08AE10  3441          LBI   FBO,X'10'                 ADDRESS TAG
0F61 201385  101385  3442          BU    TIPNOCHK               TO TAG FLIPPER
0F62 0A040A  08840A  3443          LBI   L4,X'0A'               PRESET WRONG DEVICE SELECTED MSG
0F63 0D8362  06C362  3444          TEOR  L3,FBI                 COMPARE PHYSICAL DRV ADDR
0F64 004707  010707  3445          BNZ   TEFNRERR               GO POST ERROR IF DIFFERENT
0F65 2A268F  18A68F  3446          LBI   FTO,CONTROL            SET CONTROL TAG
0F66 0A2E83  08AE83  3447          LBI   FBO,SENSTAT1           READ STATUS BYTE 1
0F67 201385  101385  3448          BU    TIPNOCHK               TO TAG FLIPPER
0F68 07227E  0C627E  3449          TBOFF 4,FBI,TIOCKWRT         GO IF NO WRT ENABLE          -<GHD>-
0F69 0E5120  09D120  3450          ORI   CEBI,WRENABLE          POST WRITE ENABLES
0F6A 05627B  05627B  3451 TIOCKSIZ TBON  5,FBI,TIOSIZER         CHECK FOR                    -<GHD>-
0F6B 25E27B  17627B  3452          TBON  7,FBI,TIOSIZER            CORRECT SIZE              -<GHD>-
0F6C 2A0021  188021  3453          LBI   L0,D(SVPOPT)           GET SVP OPTION
0F6D 2400C1  1040C1  3454          LINC  L1,L0,0                    BYTE
0F6E 060172  084172  3455          TIBOF ALOW12,L1,TIO70MB      GO IF 12MB DATA MODULE NOT ALLOWED
0F6F 05A277  066277  3456          TBON  6,FBI,TIOSKDM          GO IF 70MB DM ON OR ADDRESSED
0F70 0E5404  09D404  3457          ORI   MSC2,SIZE12            TURN ON 12MB MARK
0F71 200F77  100F77  3458          B     TIOSKDM                GO CONTINUE, SKIP CHK FOR DM ATTN
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0F72 27A27B  1E627B  3459 TIO70MB  TBOFF 6,FBI,TIOSIZER         GO POST ERROR IF NOT 70MB DM -<GHD>-
0F73 0A083A  08883A  3460          LBI   L8,D(EFSENSEL)         FETCH EXTENDED FUNCT SENSE BYTES FM
0F74 2408C5  1048C5  3461          LINC  L5,L8,0                 C.S. (DON'T DO SIO IF INT PENDING)
0F75 2D0543  14C543  3462          TAND  L5,L3                  CHECK IF DM ATTN INTERUPT IS ON
0F76 204F79  110F79  3463          BNZ   TIODMINT               GO POST ERROR IF YES
0F77 0E2DF6  08EDF6  3464 TIOSKDM  ANDI  FTR,X'F6'              ENABLE ERROR TRAP AND DISABLE INDEX
0F78 001000  001000  3465 TIOBEGIN B     TIODOSIO               OTHERWISE, GO CONTINUE IN NEXT BLOCK
0F79 0A0803  088803  3466 TIODMINT LBI   L8,X'03'              POST DM INT PENDING, FORMAT 0, MSG 3
0F7A 001104  001104  3467          B     TIOL700                GO POST CMD REJECT & ASSM SENSE INFO
                     3468 *
                     3469 *  COME HERE IF WRONG DM SIZE                                  -<GHD>-
0F7B 0A081E  08881E  3470 TIOSIZER LBI   L8,X'1E'              POST WRONG DM SIZE STATUS    -<GHD>-
0F7C 2A0701  188701  3471          LBI   L7,X'01'               POST INTERVENTION REQUIRED   -<GHD>-
0F7D 00015F  00015F  3472          B     TCUDMERR               GO TO SET UNIT CHECK & IO ATTN LIGHT
                     3473 *                                                            -<GHD>-
0F7E 00015A  00015A  3474 TIOCKWRT B     TCUCKWRT               GO TO CHECK FOR WRITE COMMAND-<GHD>-
                     3475          MBLOK
0F7F 000F7F  000F7F  3476+         B     *                      UNUSED ::::::::::::
1000                 3477+         DS    <0>B
                     3478 *
                     3479 *  THIS SECTION FETCHES DDDR, DDCR AND DDCF
                     3480 *
1000 2E83FF  1AC3FF  3481 TIODOSIO EORI  L3,FF                  INVERT BSDA
1001 0E82FF  0AC2FF  3482          EORI  L2,FF                  INVERT BSDA IN L2
1002 2F0642  1CC642  3483          AND   L6,L2                  RESET SEEK INCOMPLETE
1003 040786  004786  3484          SINC  L6,L7,0                RESTORE MARK
1004 0F0A43  0CCA43  3485          AND   UNCK,L3                RESET INTERVENTION REQUIRED
1005 0E03F0  08C3F0  3486          ANDI  L3,X'F0'               USE ONLY BIT 0-3 AS MASK
1006 0F3F43  0CFF43  3487          AND   SBO,L3                 RESET UNIT CHECK
1007 0C0C07  00CC07  3488          TANDI QBYT,X'07'             SEE IF CMD IS  SEEK OR RECAL
1008 02500A  09100A  3489          BZ    TIONODR                GO IF YES (DO NOT FETCH DDDR)
1009 0011CB  0011CB  3490          BU    TIORDDDR               FETCH DDDRHI TO L2 & DDDRLO TO L3
100A 27C30D  1F430D  3491 TIONODR  TIBOF DDODD,L3,*+3           GO IF DDDRODD SHOULD BE OFF
100B 0E5420  09D420  3492          ORI   MSC2,DDDRODD           TURN DDDR ODD MARK ON
100C 0E4901  09C901  3493          ORI   GEN1,ODDXFER           TURN FILE ODD XFER SWITCH ON
100D 2A0012  188012  3494          LBI   L0,D(DDDRORG)          SET DISPLACEMENT FOR DLS STORE DDDR
100E 244082  114082  3495          SINC  L2,L0,1                STORE DDDR HI
100F 044083  014083  3496          SINC  L3,L0,1                STORE DDDR LO
1010 241365  105365  3497          TIBON RDSNS,MSC1,TIOSKALL GO SKIP DDCR, DDCF FETCH IF RD SNS
1011 2011C6  1011C6  3498          BU    TIORDDCR               FETCH DDCR
1012 244082  114082  3499          SINC  L2,L0,1                STORE DDCR HI
1013 240083  104083  3500          SINC  L3,L0,0                STORE DDCR LO
                     3501 *    FETCH DDCF
1014 2A3300  188300  3502          LBI   DXC,X'00'              SET DXC FOR CHANNEL TO CS DATA XFER
1015 089E85  029E85  3503          SABI  BLOCKCH,B(DDCFORGL+X'8000') SET BLOK ADDR TO DDCF BUF
1016 28BE01  12BE01  3504          SADI  DISPCH,D(DDCFORGL+1) SET DISPLACEMENT TO FLAG BYTE - 2
1017 27C31A  1F431A  3505          TIBOF DDODD,L3,*+3           GO IF DDCF IS ON EVEN BOUNDARY
1018 0E5440  09D440  3506          ORI   MSC2,DDCRODD           TURN ON DDCR ODD BIT
1019 0E7340  09F340  3507          ORI   DXC,CHANODD            CHANNEL ODD TRANSFER ON
101A 28D75B  139758  3508          SZI   ZLSCH,ZLSFCHAN         STORE TO CS FROM CO2
101B 2A2100  18A100  3509          LBI   CCH,0                  SET UP CHANNEL COUNTER
101C 2A3108  18B108  3510          LBI   CCL,8                    FOR 10 BYTE TRANSFER FROM CHANNEL
101D 2A073E  18873E  3511          LBI   L7,D(TIOTIO81)         SET RETURN POINTER FOR SUBROUTINE
                     3512 *
                     3513 *    SUBROUTINE TO INITIATE CHANNEL DATA TRANSFER AND WAIT FOR END
                     3514 *       (L7 MUST BE SET UP BEFORE BRANCHING TO THIS ROUTINE)
                     3515 *
101E 2A2310  18A310  3516 TIOCHXFR LBI   DST,ALWCHXFR         START TRANSFER SEQUENCE
101F 24A32C  12632C  3517 TIOFWAIT TIBON ENDCHXFR,DST,TIODFEND  GO WHEN END OF TRANSFER COMES ON
1020 021020  081020  3518          NOP   *                      DELAY
1021 221021  181021  3519          NOP   *                      DELAY
1022 221022  181022  3520          NOP   *                      DELAY
1023 021023  081023  3521          NOP   *                      DELAY
1024 0ED001  0BD001  3522          ADDI  ZER,1                  INCREMENT MICROPROGRAM TIMER
1025 22901F  1A101F  3523          BNC   TIOFWAIT               GO IF NOT TIMEOUT
1026 241328  105328  3524          TIBON RDSNS,MSC1,TIOADCHK GO IF RD SNS CMD
1027 000A10  000A10  3525          B     TENL825                GO POST NO CHAN END ERROR
1028 08CE08  038E08  3526 TIOADCHK SZI   ZLSEXTB,X'08'          CHANGE EXT ZONE TO FORCE ADPT CHECK
1029 08E800  03A800  3527          SLKI  8,0                    TURN ON PCR REQUEST
102A 0A2F00  08AF00  3528          LBI   SCN,0                  FORCE ADAPTER CHECK
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

102B 001028  00102B 3529          B     *              HANG WITH ADAPTER CHECK
102C 2A10FE  1890FE 3530 TIODFEND LBI   ZER,X'FE'      DELAY TO INSURE
102D 0ED001  0BD001 3531          ADDI  ZER,1            END OF
102E 02902D  0A102D 3532          BNC   *-1                 CHANNEL XFER
102F 261331  185331 3533          TIBOF RDSNS,MSC1,*+2   GO IF NOT RD DIAG SNS
1030 246B28  116B28 3534          T8ON  1,HES,TIOADCHK   GO IF CIO/1 PARITY CHECK
1031 2F9050  1ED050 3535          EOR   ZER,ZER          RESTORE ZER
1032 0A2300  08A300 3536          LBI   DST,0            RESET ALLOW CHAN XFER & END OF XFER
1033 011007  041007 3537          BR    B(TIOCHXFR),L7   GO TO RETURN BRANCH BELOW
1034 20086E  100B6E 3538 TIOTENA1 B     TENTIOB1       RETURN
1035 200B79  100B79 3539 TIOTENA2 B     TENTIOB2       RETURN
1036 000A0B  000A0B 3540 TIOTENA3 B     TENTIOB3       RETURN
1037 000A1A  000A1A 3541 TIOTENA4 B     TENTIOB4       RETURN
1038 201155  101155 3542 TIOTIOA2 B     TIOTIOB2       RETURN
1039 201D65  101D65 3543 TIOTWRA1 B     TWRTIOB1       RETURN
103A 201D77  101D77 3544 TIOTWRA2 B     TWRTIOB2       RETURN
103B 201D71  101D71 3545 TIOTWRA3 B     TWRTIOB3       RETURN
103C 000E1E  000E1E 3546 TIOTFEA1 B     TFETIOB1       RETURN
103D 000E44  000E44 3547 TIOTFEA2 B     TFETIOB2       RETURN
                    3548 *
103E 0A0001  088001 3549 TIOTIOB1 LBI   LO,D(DDCFORGL+1) PAC  ADDRESS IN BUFFER
103F 0A0181  088181 3550          LBI   L1,D(DDCFORGR+1) PAH    ADDRESS IN BUFFER
1040 04008E  00408E 3551          SINC  PAC,LO,0         STORE PAC AND PAH IN BUFFER TO
1041 04018F  00418F 3552          SINC  PAH,L1,0           CLEAR OP-REG CHECK AFTER POWER UP
1042 065444  095444 3553          TIBOF DDCRODD,MSC2,*+2 GO IF DDCF IS ON EVEN BOUNDARY
1043 0015F0  0015F0 3554          BU    TRDMEVEN         SHIFT DDCF TO EVEN BOUNDARY
1044 2A0509  188509 3555          LBI   L5,9             SET REG FOR SUBROUTINE
1045 2A087C  18887C 3556          LBI   L8,D(TENTIOA1)   DISPLACEMENT FOR RETURN BRANCH
1046 20096C  10096C 3557          B     TENAJAX          GO CHECK CHNL CNTR & RESTORE DDCR
                    3558 *
1047 0A0002  088002 3559 TIOTENB1 LBI   LO,D(DDCFORGL+2) FLAG ADDRESS IN BUFFER
1048 0A0184  088184 3560          LBI   L1,D(DDCFORGR+4) RECORD ADDRESS IN BUFFER
1049 24C0D5  1340D5 3561          LINC  FLAG,LO,3        FETCH FLAG BYTE
104A 2441D9  1141D9 3562          LINC  REC,L1,1         FETCH RECORD BYTE
104B 0440DA  0140DA 3563          LINC  KCNT,LO,1        FETCH KEY LENGTH BYTE
104C 0441C3  0141C3 3564          LINC  L3,L1,1          FETCH DATA LENGTH HIGH
104D 2740DB  1D40DB 3565          LDEC  DCNT,LO,3        FETCH DATA LENGTH LOW, POINT TO CLO
104E 0701DC  0C41DC 3566          LDEC  NREC,L1,4        FETCH NUMBER OF RECORDS,POINT TO CHI
104F 24D953  135953 3567          TBON  3,REC,TIORNTO    GO IF NOT RECORD ZERO
1C50 0A1C00  089C00 3568          LBI   NREC,0           SET N TO ZERO IF RECORD ZERO
1051 2A0186  188186 3569          LBI   L1,D(DDCFORGR+6) SET DISPL TO N IN DDCF
1052 27019C  1C419C 3570          SDEC  NREC,L1,4        SET N TO ZERO IN DDCF
                    3571 *--->SET UP DATA AND KEY LENGTH MARKS
1053 0C03FE  0DC3FE 3572 TIORNTO  TANDI L3,X'FE'         TEST HI DATA COUNT
1054 005062  011062 3573          BNZ   TIOGREAT           AND GO IF > 256
1055 27C358  1F4358 3574          T8OFF 7,L3,*+3         GO IF DATA LENGTH NOT 256
1056 0E5401  09D401 3575          ORI   MSC2,DL256       SET DATA LENGTH 256 BIT
1057 00105A  00105A 3576          B     *+3              SKIP 2 INSTRUCTIONS
1058 04DB5A  035B5A 3577          TBON  3,DCNT,*+2       GO IF DATA LENGTH NOT ZERO
1059 0E5408  09D408 3578          ORI   MSC2,DLO         SET DATA LENGTH ZERO BIT
105A 2B041B  1C841B 3579          MV    L4,DCNT          MOVE LO DATA COUNT TO WORK REG
105B 2F041A  1CC41A 3580          ADD   L4,KCNT          ADD KEY TO LO DATA COUNT
105C 2F4310  1DC310 3581          ADDC  L3,ZER             FINISH ADD
105D 0C03FE  0DC3FE 3582          TANDI L3,X'FE'         TEST (KL+DL) HI BYTE
105E 025060  091060 3583          BZ    *+2                GO IF COUNT IS 256 OR LESS
105F 0E5402  09D402 3584          ORI   MSC2,KDGT256     SET KEY+DATA COUNT > 256 MARK
1060 07C363  0F4363 3585          T8OFF 7,L3,TIORORC     GO IF 256 WEIGHT BIT IS OFF
1061 06C463  0B4463 3586          T8OFF 3,L4,TIORORC     GO IF LO COUNT IS ZERO
1062 0E5402  09D402 3587 TIOGREAT ORI   MSC2,KDGT256    SET KEY+DATA COUNT > 256
1063 278C65  1E4C65 3588 TIORORC  T8OFF 6,QBYT,TIOSKALL  GO IF READ OR CONTROL TYPE CMDS
1064 001897  001897 3589          BU    TSK3WIN          GO CONVERT S/3 CCHH TO WINCH CCHH
1065 201100  101100 3590 TIOSKALL B     TIOCMDEC         GO DO COMMAND DECODE
                    3591 *
                    3592 *  THIS SECTION HANDLES DATA MODULE ATTENTION
                    3593 *
1066 0E82FF  0AC2FF 3594 TIODOATT EORI  L2,FF            INVERT BSDA
1067 2F0A42  1CCA42 3595          AND   UNCK,L2          RESET COUNTER OVERFLOW MARK
1068 2F0642  1CC642 3596          AND   L6,L2            RESET SEEK INCOMPLETE  MARK
1069 040786  004786 3597          SINC  L6,L7,0          RESTORE MARK
106A 0B0E10  0C8E10 3598          MV    PAC,ZER          RESET PAC
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

106B 2B0F10  1C8F10 3599          MV    PAH,ZER          RESET PAH
106C 2A063A  18863A 3600          LBI   L6,D(EFSENSEL)   GET EXTENDED FUNCTIONAL
106D 0406C0  0046C0 3601          LINC  LO,L6,0            SENSE BYTE
106E 2F4043  1DC043 3602          OR    LO,L3            TURN ON DM ATTN PENDING
106F 240680  106680 3603          SINC  LO,L6,0          RESTORE SENSE
1070 0E6D20  09ED20 3604          ORI   FTR,DMATTN       TURN ON DM ATTN INTERRUPT
1071 2A268F  18A68F 3605          LBI   FTO,CONTROL      SET TAG FOR CONTROL
1072 0A2E04  08AE04 3606          LBI   F8O,RSTATTN      RESET ATTENTION INTPT
1073 201385  1013B5 3607          BU    TIPNOCHK         TO TAG FLIPPER
1074 0011D9  0011D9 3608          BU    TIPZEROW         CLEAR LO TO L7
1075 289A85  129A85 3609          SABI  BLOCK8,X'85'     SETUP FOR MULTIPLE STORE
1076 240882  104882 3610          SINC  L2,L8,0          CLEAR 6 BYTES OF COUNTERS
1077 089A05  029A05 3611          SABI  BLOCK8,X'05'     RETURN TO SINGLE BYTE MODE
1078 0A2684  08A684 3612          LBI   FTO,RDSTATUS     TAG IS READ MODULE STATUS
1079 201385  1013B5 3613          BU    TIPNOCHK         TO TAG FLIPPER
107A 200F14  100F14 3614          B     TIONOATN         RETURN TO NORMAL STREAM
                    3615 *
                    3616 *  THIS SUBROUTINE INCREMENTS DDDR BY 1 AND READS THE FINAL VALUE
                    3617 *
107B 2A3D01  18BD01 3618 TIODDDR1 LBI   B00,1            LOAD LO DIFFERENCE TO B00
107C 0E2340  08E340 3619          ANDI  DST,CHOUTVAL     COPY B00 TO CIO
107D 0A3D00  08BD00 3620          LBI   B00,0            LOAD HI DIFFERENCE TO B00
107E 2E33FD  18F3FD 3621          ANDI  DXC,FF-SUBTRACT  TURN OFF SUBTRACT FOR THIS OP
107F 20114D  10114D 3622          B     TIOUDDDR         GO FINISH UP AND RETURN
                    3623          MBLOK
1100                3624+         DS    <0>B
                    3625 *  THIS SECTION DOES COMMAND DECODE
                    3626 *
1100 0C0DF0  00CDF0 3627 TIOCMDEC TANDI RBYT,X'F0'       SEE IF R 0 TO 3 ALL ZERO
1101 225106  191106 3628          BZ    TIOROK           GO IF BITS ARE ZERO
1102 2E12F7  18D2F7 3629 TIOCMRJT ANDI  CEB2,FF-WHAOK    RESET ALLOW WRITE HA
1103 2A0801  188801 3630          LBI   L8,X'01'         POST INVALID CMD
1104 0A0700  088700 3631 TIOL700  LBI   L7,X'00'         POST CMD REJECT
1105 201908  101908 3632          B     TSNNORM
                    3633 *
1106 26A708  1A6708 3634 TIOROK   TIBOF ERRMODE,FHF,*+2  SKIP NEXT INSTRUCTION IF NOT ERRMODE
1107 000E06  000E06 3635          B     TFETIO           GO TO FORCE ERROR ROUTINE
1108 058C27  064C27 3636 TIOTFERT TBON  6,QBYT,TIOQ23    GO IF Q IS 2 OR 3
1109 25CC11  174C11 3637          TBON  7,QBYT,TIOQ1     GO IF Q IS 1
                    3638 *
                    3639 *  COMMAND BREAKOUT FOR Q EQUAL TO ZERO IS DONE HERE
                    3640 *
110A 2E12F7  18D2F7 3641          ANDI  CEB2,FF-WHAOK    RESET ALLOW WRITE HA
110B 04CD0E  034D0E 3642          TBON  3,RBYT,TIORNZ    GO IF ANY BITS ON
110C 001897  001897 3643          BU    TSK3WIN          GO CONVERT S/3 CCHH TO WINCH CCHH
110D 20170A  10170A 3644          B     TSKSEEK          SEEK COMMAND
110E 0CCDFF  03CDFF 3645 TIORNZ   TADDI RBYT,X'FF'       CHECK IF R IS 01
110F 225700  191700 3646          BZ    TSKRECAL         01 IS RECALIBRATE
1110 001102  001102 3647          B     TIOCMRJT         GO POST CMD REJECT
                    3648 *
                    3649 *  COMMAND BREAKOUT FOR Q EQUAL TO ONE IS DONE HERE
                    3650 *
1111 0CCDF6  03CDF6 3651 TIOQ1    TADDI RBYT,X'F6'       GO IF INVALID
1112 209102  121102 3652          BCY   TIOCMRJT           R-BYTE
1113 0C8D07  02CD07 3653          TEORI RBYT,X'07'       TEST FOR RD DIAG SENSE CMD
1114 025116  091116 3654          BZ    *+2              GO IF YES
1115 2E12F7  18D2F7 3655          ANDI  CEB2,FF-WHAOK    RESET ALLOW WRITE HA
1116 05CD18  074D18 3656          TBON  7,RBYT,*+2       GO IF DDCF NOT USED BY CMD
1117 001897  001897 3657          BU    TSK3WIN          GO CONVERT S/3 CCHH TO WINCH CCHH
1118 0A0718  088718 3658          LBI   L7,D(TIOQ1TAB)   GET ADDRESS OF TABLE
1119 2F070D  1CC70D 3659          ADD   L7,RBYT          ADD RBYT
111A 211107  141107 3660          BR    B(TIOQ1TAB),L7   CMD BREAK OUT
111B 00140D  00140D 3661 TIOQ1TAB B     TRDKD            READ KEY DATA
111C 201400  101400 3662          B     TRDHAROE         READ HA RO ODD
111D 001438  001438 3663          B     TRDCKD           READ COUNT KEY DATA
111E 001125  001125 3664          B     TIOVERKD         READ VERIFY DEV DATA
111F 201424  101424 3665          B     TRDCKDD          READ CKD DIAGNOSTIC
1120 001768  001768 3666          B     TSKRRBLG         READ AND RST BFRD LOG
1121 001102  001102 3667          B     TIOCMRJT         INVALID CMD CODE
1122 20176C  10176C 3668          B     TSKRDSNS         READ DIAGNOSTIC SENSE
```

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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1123 001407   001407  3669          B     TRDROKDO          READ RO KEY DATA ODD
1124 001402   001402  3670          B     TRDHAROO          READ HA AND RO CNT ODD
1125 001897   001897  3671 TIOVERKD BU    TSK3WIN           CONVERT CCHH TO WIN
1126 20141E   10141E  3672          B     TRDVKD            READ VERIFY KEY DATA
                      3673 *
1127 05CC3E   074C3E  3674 TIOQ23   TBON  7,QBYT,TIOQ3       GO IF Q IS 3
                      3675 *
                      3676 *  COMMAND BREAKOUT FOR Q EQUAL TO TWO IS DONE HERE
                      3677 *
1128 250D38   144D38  3678          TBON  4,RBYT,TIOQ2R8
1129 054D34   054D34  3679          TBON  5,RBYT,TIOQ2R4
112A 058D2F   064D2F  3680          TBON  6,RBYT,TIOQ2R2
112B 05CD2E   074D2E  3681          TBON  7,RBYT,TIOQ2R1
112C 2E12F7   18D2F7  3682          ANDI  CEB2,FF-WHAOK     RESET ALLOW WRITE HA
112D 001C00   001C00  3683          B     TWRKD             WRITE KEY DATA
112E 201C19   101C19  3684 TIOQ2R1  B     TWRHAROE          WRITE HA AND RO EVEN
112F 2E12F7   18D2F7  3685 TIOQ2R2  ANDI  CEB2,FF-WHAOK     RESET ALLOW WRITE HA
1130 05CD33   074D33  3686          TBON  7,RBYT,TIOQ2R3
1131 2018F0   1018F0  3687          BU    TWREVNHD          SET EVEN HEAD
1132 201C31   101C31  3688          B     TWRCKD            WRITE COUNT KEY DATA
1133 001C03   001C03  3689 TIOQ2R3  B     TWRRKD            WRITE REPEAT KEY DATA
1134 278D02   1E4D02  3690 TIOQ2R4  TBOFF 6,RBYT,TIOCMRJT    INVALID CMD CODE
1135 25CD02   174D02  3691          TBON  7,RBYT,TIOCMRJT    INVALID CMD CODE
1136 2E12F7   18D2F7  3692          ANDI  CEB2,FF-WHAOK     RESET ALLOW WRITE HA
1137 001C2B   001C2B  3693          B     TWRROO            WRITE RO ODD
1138 054D02   054D02  3694 TIOQ2R8  TBON  5,RBYT,TIOCMRJT    INVALID CMD CODE
1139 058D02   064D02  3695          TBON  6,RBYT,TIOCMRJT    INVALID CMD CODE          -<CD>-
113A 25CD3D   174D3D  3696          TBON  7,RBYT,TIOQ2R9     GO IF WRITE HA ODD        -<CD>-
113B 2E12F7   18D2F7  3697          ANDI  CEB2,FF-WHAOK     RESET ALLOW WRITE HA      -<CD>-
113C 201E4B   101E4B  3698          B     TWRWCCD           WRITE COMPRESSED COUNT DATA -<CD>-
113D 201C19   101C19  3699 TIOQ2R9  B     TWRHAROO          WRITE HA AND RO ODD       -<CD>-
                      3700 *
                      3701 *  COMMAND VALIDITY TEST FOR Q EQUAL TO THREE IS DONE HERE
                      3702 *
113E 2E12F7   18D2F7  3703 TIOQ3    ANDI  CEB2,FF-WHAOK     RESET ALLOW WRITE HA
113F 250D43   144D43  3704          TBON  4,RBYT,TIOQ3R8     GO IF SCAN READ COMMAND   -<GHD>-
1140 054D02   054D02  3705          TBON  5,RBYT,TIOCMRJT    INVALID CMD CODE          -<GHD>-
1141 25CD02   174D02  3706          TBON  7,RBYT,TIOCMRJT    INVALID CMD CODE          -<GHD>-
1142 200C4B   100C4B  3707          B     TERSTART          PROCEED TO INLINE SCAN DIAGNOSTIC
1143 274D02   1D4D02  3708 TIOQ3R8  TBOFF 5,RBYT,TIOCMRJT    INVALID CMD CODE
1144 058D02   064D02  3709          TBON  6,RBYT,TIOCMRJT
1145 200C4B   100C4B  3710          B     TERSTART          PROCEED TO INLINE SCAN DIAGNOSTIC
                      3711 *
                      3712 *    READ/UPDATE DDCR SUBROUTINE
                      3713 *
1146 0A3D00   08BD00  3714 TIORDDCR LBI   B00,0             CLEAR B00
1147 0E2340   08E340  3715          ANDI  DST,CHOUTVAL      COPY B00 TO CIO
1148 2E33EF   18F3EF  3716 TIOUDDCR ANDI  DXC,FF-LSRSELDR   LSR SELECT DDCR
1149 0E7302   09F302  3717          ORI   DXC,SUBTRACT      ALWAYS SUBTRACT ON DDCR OP
114A 20114E   10114E  3718          B     TIOSETUP          GO FINISH USING COMMON CODE
                      3719 *
                      3720 *    READ/UPDATE DDDR SUBROUTINE
                      3721 *
1148 0A3D00   08BD00  3722 TIORDDDR LBI   B00,0             CLEAR B00
114C 0E2340   08E340  3723          ANDI  DST,CHOUTVAL      COPY B00 TO CIO
114D 0E7310   09F310  3724 TIOUDDDR ORI   DXC,LSRSELDR     LSR SELECT DDDR
114E 0E7320   09F320  3725 TIOSETUP ORI   DXC,LSRCSR       LSR REQUEST
114F 0E7301   09F301  3726          ORI   DXC,CHNL1BYT      SET UP
1150 2A2100   18A100  3727          LBI   CCH,X'00'           FOR
1151 0A3100   08B100  3728          LBI   CCL,X'00'              LSR OPERATION WITH CHANNEL
1152 2A0738   188738  3729          LBI   L7,D(TIOTIOA2)    SET UP RETURN POINTER AND
1153 2E337F   18F37F  3730          ANDI  DXC,X'7F'         RESET DATA TO CHANNEL
1154 00101E   00101E  3731          B     TIOCHXFR            GO DO CHANNEL TRANSFER
1155 280338   1C833B  3732 TIOTIOB2 MV    L3,CO2            MOVE DDDR/DDCR LO INTO L3
1156 0E2340   08E340  3733          ANDI  DST,CHOUTVAL      TRANSFER DDDR/CR HI FROM COO TO CO2
1157 0B023B   0C823B  3734          MV    L2,CO2            MOVE DDDR/DDCR HI INTO L2
1158 0F90D0   0ED000  3735          EORU  ZER,ZER           RETURN
                      3736          END COPY-MEMBER TIO12
                      3737     COPY       TIP12
                      3738 ************************************************
```



```
LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                      3739 *  THIS SUBROUTINE ZEROS WORK STORE LO THRU L7
                      3740 ************************************************
                      3741 *
1159 0A0400   088400  3742 TIPZEROW LBI   L4,X'00'           CLEAR
115A 2A0500   188500  3743          LBI   L5,X'00'
115B 2A0600   188600  3744          LBI   L6,X'00'           WORK
115C 0A0700   088700  3745          LBI   L7,X'00'
115D 2A0000   188000  3746 TIPZERO3 LBI   L0,X'00'           STORE
115E 0A0100   088100  3747          LBI   L1,X'00'
115F 0A0200   088200  3748          LBI   L2,X'00'           AND
1160 2B4382   1D8382  3749 TIPBSDA  MVXU  L3,L2               RETURN
                      3750 *
                      3751 ************************************************************
                      3752 *  SUBROUTINE TO FETCH Q AND R BYTE FOR SIO
                      3753 ************************************************************
                      3754 *
1161 2B040C   1C840C  3755 TIPGETQR MV    L4,QBYT           SAVE CURRENT Q-BYTE
1162 2B0C3B   1C8C3B  3756          MV    QBYT,CO2          FETCH Q BYTE
1163 0E2340   08E340  3757          ANDI  DST,CHOUTVAL      MOVE R-BYTE TO CO2
1164 0B0D3B   0C8D3B  3758          MV    RBYT,CO2          FETCH R BYTE
1165 058C6C   064C6C  3759          TBON  6,QBYT,TIPGO1     GO IF NOT
1166 07CC6C   0F4C6C  3760          TBOFF 7,QBYT,TIPGO1       NOT READ CMD
1167 2E5380   19D380  3761          ORI   MSC1,RDSNS        TURN ON RD SENSE MARK TO SKIP CHKING
1168 0C8D08   02CD08  3762          TEORI RBYT,X'0B'        SEE IF RD EFS CMD
1169 025173   091173  3763          BZ    TIPGO2            GO IF YES
116A 0C8D0D   02CD0D  3764          TEORI RBYT,X'0D'        SEE IF RESET DM ATTN CMD
116B 025173   091173  3765          BZ    TIPGO2            GO IF YES
116C 0F844C   0EC44C  3766 TIPGO1   EOR   L4,QBYT           COMPARE DRIVE ADDR
116D 0E04F8   08C4F8  3767          ANDI  L4,X'F8'          MASK OFF UNWANTED BITS
116E 025170   091170  3768          BZ    *+2               GO IF SAME DRIVE
116F 2E12F7   18D2F7  3769          ANDI  CEB2,FF-WHAOK     RESET ALLOW WRITE HA BIT
1170 0E4980   09C980  3770          ORI   GEN1,STACKCMD     SET STACKED CMD
1171 0E137F   08D37F  3771          ANDI  MSC1,FF-RDSNS     RESET RD SENSE MARK
1172 0E2706   08E706  3772          ANDI  FHF,SCNSAT+SCNEQ  RESET SCAN SATISFIED AND SCAN EQUAL
1173 0F90D0   0ED0D0  3773 TIPGO2   EORU  ZER,ZER           RETURN
                      3774 *
                      3775 *
                      3776 *
                      3777 ************************************************************************
                      3778 * THIS SUBROUTINE GENERATES BIT SIGNIFICANT DEVICE ADDRESS IN
                      3779 * L3(0-3) & L2(4-7) FROM THE DRIVE  ADDRESS IN QBYT.
                      3780 ************************************************************************
                      3781 *
1174 2A0204   188204  3782 TIPBSGEN LBI   L2,X'04'          INITIALIZE BSDA TO DRIVE 2   -<GHD>-
1175 250C77   144C77  3783          TBON  4,QBYT,*+2        GO IF DRIVE 2                -<GHD>-
1176 2F0202   1CC202  3784          ADD   L2,L2             FORM BSDA FOR DRIVE 1        -<GHD>-
1177 2B4382   1D8382  3785          MVXU  L3,L2             SET BSDA IN L3 AND RETURN    -<GHD>-
                      3786 *
                      3787 ************************************************************************
                      3788 *  THIS SUBROUTINE SELECTS THE DRIVE
                      3789 ************************************************************************
                      3790 *
1178 0E258F   08E58F  3791 TIPSELECT ANDI  FTG,FF-SELHOLD    DROP SELECT HOLD
1179 2E6540   19E540  3792          ORI   FTG,X'40'         RAISE SELECT HOLD
117A 2A2683   18A683  3793          LBI   FTG,X'83'         TAG IS SELECT DEVICE
117B 0B2E00   0CAE00  3794          MV    FBO,LO            LO POINTS TO CURRENT DRIVE
117C 001335   001335  3795          B     TIPNOCHK          TO TAG FLIPPER; RETURN FROM THERE
                      3796          MBLOK
117D 20117D   10117D  3797+         B     *                 UNUSED  ::::::::::::
117E 20117E   10117E  3798+         B     *                 UNUSED  ::::::::::::
117F 00117F   00117F  3799+         B     *                 UNUSED  ::::::::::::
1200                  3800+         DS    <0>B
                      3801 *
                      3802 ************************************************
                      3803 *  THIS SECTION IS THE BASIC IDLE LOOP
                      3804 ************************************************
                      3805 *
1200 04097E   00497E  3806 TIPSTKCK TIBON STACKCMD,GEN1,TIPSTKCM  GO IF STACK CMD PENDING
1201 24237D   10637D  3807          TIBON IOPBUSY,DST,TIPSIO  GO IF START IO PENDING
1202 0018CB   0018CB  3808 TIPIDLE  BU    TSNSKTMR          CHECK FOR TIMEOUT ON SEEK BUSY
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1203 0A0001   088001  3809 TIPSTRTN LBI   L0,X'01'          INITIALIZE TO DRIVE 2 BUSOUT -<GHD>-
1204 2A0140   188140  3810          LBI   L1,X'40'          UNIT CHECK MASK, DRIVE 2     -<GHD>-
1205 0011F8   0011F8  3811 TIPNEXT  BU    TIPSLECT          GO TO SELECT DRIVE
1206 08E100   03A100  3812          SLKI  1,0               RESET PREVENT I/O FLIP LATCH IN SVP
1207 0AE104   08A104  3813          LLKR  L4,1              SAMPLE SVP REQUEST LATCH
1208 278415   1E4415  3814          TIBOF SVPREQ,L4,TIPNOSVP GO IF NO SVP REQUEST
1209 2AE004   1BA004  3815          LLKR  L4,0              GATE X-REG TO L4
120A 08E400   03A400  3816          SLKI  4,0               RESET SVP REQUEST LATCH
120B 2A0521   1E8521  3817          LBI   L5,D(SVPOPT)      SET CS DISPL TO SAVE X-REG
120C 0405C6   0045C6  3818          LINC  L6,L5,0           GET OLD OPTION BYTE AND
120D 2E0680   18C680  3819          ANDI  L6,ALOW12             SAVE ALLOW 12MB MARK
120E 0F4446   0DC446  3820          OR    L4,L6             OR IN TO NEW OPTION BYTE
120F 040584   004584  3821          SINC  L4,L5,0           SAVE X-REG AS OPTION BYTE
1210 068415   0A4415  3822          TIBOF FORCERST,L4,TIPNOSVP  GO IF FORCE SYSTEM RST NOT ON
1211 289400   129400  3823          SABI  MIAREB,B(TRSYSRST) SET MIAR FOR EXTERNAL
1212 28B42F   12B42F  3824          SADI  MIARED,D(TRSYSRST)     TRAP TO SYSTEM RESET ENTRY
1213 2881BF   1281BF  3825          SABI  INDEXB,X'BF'      CHANGE BASE INDEX TO GO TO PGM 5
1214 201214   101214  3826          B     *                 HANG TILL PROGRAM SWITCHES
1215 0A2E08   08AE08  3827 TIPNOSVP LBI   FBO,X'08'         EXPECTED STATUS IN FBO
1216 0A2684   08A684  3828          LBI   FTO,X'84'          TAG IS READ MODULE STATUS
1217 2013B5   1013B5  3829          BU    TIPNOCHK          TO TAG FLIPPER
1218 0D014A   04C14A  3830          TAND  L1,UNCK           SEE IF INTERV REQD IS ON
1219 22523F   19123F  3831          BZ    TIPNIREQ          GO IF NOT ON
121A 072239   0C6239  3832          TBOFF 4,FBI,TIPSKEXM    GO IF NOT ONLINE
121B 0F8A41   0ECA41  3833          EOR   UNCK,L1           RESET INTERV REQD
121C 2B043F   1C843F  3834          MV    L4,SBO            COPY SBO
121D 2E04F0   18C4F0  3835          ANDI  L4,X'F0'          MASK OFF SK BUSY BITS
121E 2F8441   1EC441  3836          EOR   L4,L1             RESET UNIT CHECK
121F 2B3F04   1CBF04  3837          MV    SBO,L4            COPY NEW STATUS BACK TO SBO
1220 05A23A   06623A  3838 TIPDMEXM TBON  6,FBI,TIPNSCOM    GO IF SEEK BUSY
1221 276239   1D6239  3839          TBOFF 5,FBI,TIPSKEXM    GO IF NO DH ATTN
1222 00139C   00139C  3840          BU    TIPUCWPT          GENERATE UCW PTR
1223 0EC618   0BC618  3841          ADDI  L6,X'18'          POINT TO PA BYTES
1224 0A070A   08870A  3842          LBI   L7,10             SET COUNTER TO 10
1225 244690   114690  3843          SINC  ZER,L6,1          ZERO CURRENT PA,
1226 2EC7FF   1BC7FF  3844          ADDI  L7,-1                OLD PA, READ AND
1227 205225   111225  3845          BNZ   *-2                  SEEK USAGE COUNTERS
1228 2B4201   1D8201  3846          MVX   L2,L1             MOVE BSDA TO L2 BITS 4-7
1229 0E82FF   0AC2FF  3847          EORI  L2,FF             INVERT ALL BITS FOR RESET
122A 2F0A42   1CCA42  3848          AND   UNCK,L2           RESET COUNTERS OVERFLOW MARK
122B 2A071F   18871F  3849          LBI   L7,D(SKMARK1)     GET SEEK
122C 2407C6   1047C6  3850          LINC  L6,L7,0              INCOMPLETE MARK
122D 2F3642   1CC642  3851          AND   L6,L2             RESET SEEK INCOMPLETE
122E 040786   004786  3852          SINC  L6,L7,0           RESTORE MARKS
122F 0A073A   08873A  3853          LBI   L7,D(EFSENSEL)    GET EXTENDED
1230 2407C6   1047C6  3854          LINC  L6,L7,0              FUNCT SENSE MARKS
1231 0F4641   0DC641  3855          OR    L6,L1             TURN ON DH ATTN PENDING
1232 040786   004786  3856          SINC  L6,L7,0           STORE BACK
1233 0E6D20   09ED20  3857          ORI   FTR,DMATTN        TURN ON DH ATTN INTRPT
1234 25E255   176255  3858          TBON  7,FBI,TIPSKCOM    GO IF ALSO SEEK COMPLETE
1235 2A268F   18A68F  3859          LBI   FTO,CONTROL       DO ATTN
1236 0A2E04   08AE04  3860          LBI   FBO,RSTATTN          RESET
1237 2013B5   1013B5  3861          BU    TIPNOCHK          RAISE TAG GATE
1238 20123A   10123A  3862          B     TIPNSCOM          GO DESELECT DRIVE ETC...
1239 25E255   176255  3863 TIPSKEXM TBON  7,FBI,TIPSKCOM    GO IF SEEK COMPLETE
123A 0E25BF   08E5BF  3864 TIPNSCOM ANDI  FTG,FF-SELHOLD    DROP SELECT HOLD
123B 0EC0FF   0BC0FF  3865          ADDI  L0,FF             UPDATE DRIVE ADDRESS
123C 2F0101   1CC101  3866          ADD   L1,L1             SHIFT TO NEXT LOWER DRIVE
123D 005205   011205  3867          BNZ   TIPNEXT           GO IF MORE DRIVES TO GO
123E 201200   101200  3868          B     TIPSTKCK          GO CHECK FOR STACKED CMD
                      3869 *
                      3870 *   COME HERE IF INTERVENTION REQ'D BIT IS NOT ON
                      3871 *
123F 0D017F   04C17F  3872 TIPNIREQ TAND  L1,SBO            SEE IF UNIT CHECK PENDING
1240 205220   111220  3873          BNZ   TIPDMEXM          GO IF PENDING
1241 052220   046220  3874          TBON  4,FBI,TIPDMEXM    GO IF ONLINE
1242 24233A   10633A  3875          TIBON IOPBUSY,DST,TIPNSCOM  GO IF START I/O PENDING
1243 2A081F   18881F  3876          LBI   L8,D(SKMARK1)     GET SEEK IN
1244 04C6C4   0048C4  3877          LINC  L4,L8,0              PROGRESS MARK
1245 2D0441   14C441  3878          TAND  L4,L1             GO IF SEEK NOT IN
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1246 025249   091249  3879          BZ    *+3                  PROGRESS
1247 2A0B89   188B89  3880          LBI   STAT,X'89'        POST SEEK COMPLETE AND CHECK
1248 00124C   00124C  3881          B     TIPL815           POST INTERV REQUIRED ERROR
1249 2001C4   1001C4  3882          BU    TCUSETUC          TURN ON UNIT CHECK FOR TIO
124A 2E4B80   19CB80  3883          ORI   STAT,ERRRETUN      POST ERROR RETURN MARK
124B 0F4A41   0DCA41  3884          OR    UNCK,L1           POST MARK FOR INTV REQD
124C 2A0815   188815  3885 TIPL815  LBI   L8,X'15'          FORMAT 1 MSGE 5
124D 2A0701   188701  3886 TIPL701  LBI   L7,X'01'          POST INTERVENTION REQUIRED
124E 00139C   00139C  3887 TIPUCW   BU    TIPUCWPT          GENERATE UCW POINTER
124F 2A051E   18851E  3888          LBI   L5,D(UCWPTR)      POINT TO UCWPTR
1250 240586   104586  3889          SINC  L6,L5,0           SAVE UCW POINTER
1251 0EC618   0BC618  3890          ADDI  L6,X'18'          POINT TO CURRENT PA
1252 0446CE   0146CE  3891          LINC  PAC,L6,1          FETCH PAC
1253 0406CF   0046CF  3892          LINC  PAH,L6,0             AND PAH
1254 201908   101908  3893          B     TSNNORM           GO TO ERROR ROUTINE
                      3894 *
                      3895 *
                      3896 ************************************************************
                      3897 * A SEEK COMPLETE INTERRUPT DETECTED IN THE IDLE LOOP COMES
                      3898 *  HERE FOR HANDLING..
                      3899 ************************************************************
                      3900 *
1255 2A081F   18881F  3901 TIPSKCOM LBI   L8,D(SKMARK1)     GET SEEK IN
1256 0408C4   0048C4  3902          LINC  L4,L8,0              PROGRESS MARK
1257 2D0144   14C144  3903          TAND  L1,L4             IGNORE SEEK COMPLETE IF SEEK IN
1258 22523A   19123A  3904          BZ    TIPNSCOM             PROG NOT ON... INTRPT STUCK ON
1259 046279   016279  3905          TBON  1,FBI,TIPSKBAD    GO IF INTFCE CK
125A 04A279   026279  3906          TBON  2,FBI,TIPSKBAD    GO IF DRIVE CHECK
125B 2B4201   1D8201  3907          MVX   L2,L1             MOVE BSDA TO L2 BITS 4-7
125C 040965   004965  3908          TIBON STACKCMD,GEN1,TIPSCSTK  IF IF STACKED CMD PENDING
125D 0B0402   0C8402  3909          MV    L4,L2             COPY BSDA
125E 0E44F0   09C4F0  3910          ORI   L4,X'F0'          DON'T RESET PENDING UNIT CHECK
125F 24237D   10637D  3911          TIBON IOPBUSY,DST,TIPSIO  GO IF START I/O PENDING
1260 2F3F44   1CFF44  3912          AND   SBO,L4            RESET SEEK BUSY ACCORDING TO BSDA
1261 06236C   08636C  3913          TIBOF IOPBUSY,DST,TIPSETSC   GO SET SK COMPLETE IF NO SIO
1262 2A0820   188820  3914          LBI   L8,D(SKMARK2)     CS DISPLACEMENT TO SEEK MARK 2
1263 240882   104882  3915          SINC  L2,L8,0           POST JUST RST SEEK BUSY MARK
1264 20126C   10126C  3916          B     TIPSETSC          GO POST SEEK COMPLETE
                      3917 *
                      3918 *  COME HERE TO HANDLE SEEK COMPLETE WITH STACK CMD PENDING
                      3919 *
1265 0011F4   0011F4  3920 TIPSCSTK BU    TIPBSGEN          GENERATE BSDA FROM Q-BYTE
1266 2D8143   16C143  3921          TEOR  L1,L3             COMPARE DEVICE ADDR
1267 00526A   01126A  3922          BNZ   *+3               GO IF STACK CMD NOT FOR THIS DRIVE
1268 0C0C07   00CC07  3923          TANDI QBYT,X'07'        CHECK FOR CONTROL TYPE CMD
1269 22526C   19126C  3924          BZ    *+3               GO IF STACK CMD IS CONTROL TYPE
126A 2B4201   1D8201  3925          MVX   L2,L1             MOVE BSDA TO L2 BITS 4-7
126B 2001C8   1001C8  3926          BU    TCURSTSB          RESET SEEK BUSY
126C 0B2302   0CA302  3927 TIPSETSC MV    DST,L2            POST SEEK COMPLETE
126D 0A0822   088822  3928          LBI   L8,D(SBFLAGS)     SET DISPL TO SEEK BUSY CNTR OVFL MKS
126E 0408C4   0048C4  3929          LINC  L4,L8,0           GET SEEK BUSY CNTR OVFL MARK
126F 2F8442   1EC442  3930          EOR   L4,L2             RESET SEEK BUSY CNTR OVFL MARK
1270 240884   104884  3931          SINC  L4,L8,0           RESTORE SEEK BUSY CNTR OVFL MARKS
1271 2A081F   18881F  3932          LBI   L8,D(SKMARK1)     CS DISPL TO SEEK MARK 1
1272 0408C4   0048C4  3933          LINC  L4,L8,0           GET SEEK IN PROGRESS MARKS
1273 2F8441   1EC441  3934          EOR   L4,L1             RESET SEEK IN PROGRESS
1274 240884   104884  3935          SINC  L4,L8,0           SAVE SEEK MARKS
1275 2A268F   18A68F  3936          LBI   FTO,CONTROL       RESET INTERRUPT
1276 0A2E04   08AE04  3937          LBI   FBO,RSTATTN         IN DRIVE
1277 2013B5   1013B5  3938          BU    TIPNOCHK          TO TAG FLIPPER
1278 20123A   10123A  3939          B     TIPNSCOM           GO DESELECT DEVICE
                      3940 *
                      3941 *  COME HERE TO HANDLE SEEK INCOMPLETE
                      3942 *
1279 0A0881   088881  3943 TIPSKBAD LBI   STAT,X'81'        POST ERROR RETURN WITH SEEK COMPLETE
127A 0A081B   08881B  3944 TIPNOSTK LBI   L8,X'1B'          POST SEEK CHECK
127B 2A0707   188707  3945          LBI   L7,X'07'          POST SEEK CHECK
127C 20124E   10124E  3946          B     TIPUCW            GO TO ERROR ROUTINE
                      3947 *
127D 00130F   00130F  3948 TIPSIO   B     TIPSIO1           GO TO NEXT BLOCK
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```
LOC.  OBJECT CODE      STM       SOURCE STATEMENT

127E 001312   001312  3949 TIPSTKCM B     TIPSTK1             GO TO NEXT BLOCK
                      3950         MBLOK
127F 00127F   00127F  3951+        B     *                   UNUSED  ::::::::::
1300                  3952+        DS    <0>B
                      3953 *
                      3954 *  COME HERE AFTER SENSE BYTES ALL SET UP
                      3955 *    L1 HAS BSDA IN BITS 0-3; L2 HAS BSDA IN BITS 4-7
                      3956 *
1300 2A081F   16881F  3957 TIPSKCHK LBI   L8,D(SKMARK1)       CS DISPL TO SK MARK 1
1301 0408C4   0048C4  3958         LINC  L4,L8,0             FETCH MARKS
1302 2F4442   1DC442  3959         OR    L4,L2               POST SEEK INCOMPLETE
1303 2F8441   1EC441  3960         EOR   L4,L1               RESET SEEK IN PROGRESS
1304 044884   014884  3961         SINC  L4,L8,1             RESTORE MARKS
1305 060907   084907  3962         TIBOF STACKCMD,GEN1,TIPBADNS  GO IF NO STACK CMD PENDING
1306 201320   101320  3963         B     TIPBADYS            ASSEMBLY BRANCH
                      3964 *
                      3965 *    COME HERE TO HANDLE SEEK INCOMPLETE WITH NO STACK CMD PENDING
                      3966 *
1307 06230A   08630A  3967 TIPBADNS TIBOF IOPBUSY,DST,*+3     GO IF NO SIO PENDING
1308 2011E1   1011E1  3968         BU    TIPGETQR            GET Q AND R BYTES
1309 261320   185320  3969         TIBOF RDSNS,MSC1,TIPBADYS GO HANDLE STK CMD IF NOT RD SNS CMD
130A 2001C8   1001C8  3970         BU    TCURSTSB            GO RESET SEEK BUSY
130B 26230E   18630E  3971         TIBOF IOPBUSY,DST,TIPDFDR GO IF STILL NO SIO PENDING
130C 2A0820   188820  3972         LBI   L8,D(SKMARK2)       CS DISPL TO SEEK MARK 2
130D 240882   104882  3973         SINC  L2,L8,0             SET JUST RST SEEK BUSY MARK
130E 00132E   00132E  3974 TIPDFDR  B     TIPDIFDR            GO POST SEEK COMPLETE AND UNIT CHECK
                      3975 *
                      3976 ************************************************************
                      3977 *  A START IO FROM THE CPU IS INITIALLY HANDLED HERE
                      3978 ************************************************************
                      3979 *
130F 2011E1   1011E1  3980 TIPSIO1  BU    TIPGETQR            GO GET Q AND R BYTES
1310 061312   085312  3981         TIBOF RDSNS,MSC1,TIPSTK1  GO IF NOT RD SENSE CMD
1311 001339   001339  3982 TIPGO3  B     TRDRDEFS            GO HANDLE RD EXT FUNCT SNS & DM RESET
1312 0011F4   0011F4  3983 TIPSTK1  BU    TIPBSGEN            GENERATE BSDA IN L3
1313 2A081F   18881F  3984         LBI   L8,D(SKMARK1)       GET SEEK IN
1314 0408C4   0048C4  3985         LINC  L4,L8,0                PROGRESS MARKS
1315 0D0443   04C443  3986         TAND  L4,L3               CHECK IF SEEK IN PROGRESS
1316 205202   111202  3987         BNZ   TIPIDLE             GO IF SEEK BUSY
1317 2E097F   18C97F  3988         ANDI  GEN1,FF-STACKCMD    RESET STACKED CMD
1318 0E25BF   08E5BF  3989         ANDI  FTG,FF-SELHOLD      DESELECT DRIVE
1319 2A0000   188000  3990         LBI   L0,0                INIT DRIVE ADDR TO 1
131A 0A0B18   088B18  3991         LBI   STAT,OPEND+NOOP     INIT STATUS WITH OPEND AND NOP
131B 200F00   100F00  3992         B     TIOSIO              GO EXECUTE SIO
                      3993 *
                      3994 ************************************************************
                      3995 *  THIS SUBROUTINE GENERATES UCW POINTER USING BSDA IN L1
                      3996 ************************************************************
                      3997 *
131C 2A063C   18863C  3998 TIPUCWPT LBI   L6,D(D1SENSE)       POINT TO D1
131D 04011F   00411F  3999         TBON  0,L1,TIPGETPA       GO IF DRIVE 1
131E 0A065E   08865E  4000         LBI   L6,D(D2SENSE)       POINT TO D2                    -<GHD>-
131F 0F90D0   0ED0D0  4001 TIPGETPA EORU  ZER,ZER             RETURN TO CALLER               -<GHD>-
                      4002 *
                      4003 *    COME HERE TO HANDLE SEEK INCOMPLETE WITH STACK CMD PENDING
                      4004 *
1320 0011F4   0011F4  4005 TIPBADYS BU    TIPBSGEN            GET BSDA
1321 2D8143   16C143  4006         TEOR  L1,L3               CHECK IF STACK CMD FOR THIS DEVICE
1322 20532E   11132E  4007         BNZ   TIPDIFDR            GO IF NOT
1323 2A0708   188708  4008         LBI   L7,NOOP             POST NOP IN L7 FOR STATUS
1324 0C0C07   00CC07  4009         TANDI CBYT,X'07'          CHECK FOR CONTROL TYPE COMMAND
1325 025327   091327  4010         BZ    *+2                 GO IF YES ...DONT POST OP END
1326 2E4710   19C710  4011         ORI   L7,OPEND            OR IN OP END FOR STATUS
1327 2E097F   18C97F  4012         ANDI  GEN1,FF-STACKCMD    RESET STACK CMD
1328 2001C4   1001C4  4013         BU    TCUSETUC            POST UNIT CHECK
1329 2001C8   1001C8  4014         BU    TCURSTSB            RESET SEEK BUSY
132A 0B2302   0CA302  4015         MV    DST,L2              POST SEEK COMPLETE
132B 0B3707   0CB707  4016         MV    SB1,L7              POST OTHER STATUS
132C 0E2380   08E380  4017         ANDI  DST,IOPBUSY         RESET ATTACHMENT BUSY
132D 201332   101332  4018         B     TIPDSDRV            GO DESELECT DRIVE
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

132E 2842C1   108201  4019 TIPDIFDR MVX   L2,L1               COPY BSDA TO L2
132F 2001C8   1001C8  4020         BU    TCURSTSB            RESET SEEK BUSY
1330 2001C4   1001C4  4021         BU    TCUSETUC            SET UNIT CHECK STATUS
1331 0B2302   0CA302  4022         MV    DST,L2              POST SEEK COMPLETE STATUS
1332 0E25BF   08E5BF  4023 TIPDSDRV ANDI  FTG,FF-SELHOLD      DROP SELECT HOLD
1333 241311   105311  4024         TIBON RDSNS,MSC1,TIPGO3   GO IF RD SENSE CMD
1334 001202   001202  4025         B     TIPIDLE             RETURN TO IDLE
                      4026 *
                      4027 ************************************************************
                      4028 *  THIS SUBROUTINE RAISES TAG GATE AND LOWERS IT AFTER AN APPRO-
                      4029 *  PRIATE INTERVAL WITHOUT CHECKING FOR TAG VALID
                      4030 ************************************************************
                      4031 *
1335 2E6580   19E580  4032 TIPNOCHK ORI   FTG,TAGATE          RAISE TAG GATE
1336 2ED030   1DD030  4033         ADDI  ZER,48              DELAY
1337 029336   0A1336  4034         BNC   *-1                      5.4 MICROSECONDS
1338 20150D   10150D  4035         B     TRDRDFB1            GATE F1 TO FB1 AND RETURN TO CALLER
                      4036         END COPY-MEMBER TIP12
                      4037     COPY      TRD12
                      4038 ************************************************************
                      4039 *  ENTRY FOR READ EXTENDED FUNCTIONAL SENSE COMMAND
                      4040 ************************************************************
                      4041 *
1339 254D5A   154D5A  4042 TRDRDEFS TBON  5,RBYT,TRDRSTDM     GO IF RESET DM ATTN CMD
133A 0011C8   0011C8  4043         BU    TIORDDDR            FETCH DDDRHI TO L2 & DDDRLO TO L3
133B 27C33D   1F433D  4044         TIBOF DDDDD,L3,*+2        GO IF DDDRODD (SHOULD BE OFF)
133C 0E5420   09D420  4045         ORI   MSC2,DDDRODD        TURN DDDR ODD MARK ON
133D 2A0012   188012  4046         LBI   L0,D(DDDRORG)       SET DISPLACEMENT FOR DLS STORE DDDR
133E 244082   114082  4047         SINC  L2,L0,1             STORE DDDR HI
133F 044083   014083  4048         SINC  L3,L0,1             STORE DDDR LO
1340 0A083A   08883A  4049         LBI   L8,D(EFSENSEL)      GET EXTENDED
1341 0408C4   0048C4  4050         LINC  L4,L8,0                FUNCTIONAL SENSE
1342 2A0500   188500  4051         LBI   L5,0                SET L5 TO DDDFORG LEFT
1343 269445   1A5445  4052         TIBOF DDDRODD,MSC2,*+2    GO IF DDDR ON EVEN BOUNDARY
1344 0A0580   088580  4053         LBI   L5,X'80'            SET L5 TO DDDFORG RIGHT
1345 089A06   029A06  4054         SABI  BLOCKB,X'06'        SET BLOCK ADDR TO DDDF
1346 040584   004584  4055         SINC  L4,L5,0             MOVE EFSENSE BYTE 0 TO DDDF
1347 2EC580   18C580  4056         ADDI  L5,X'80'            INCREMENT
1348 2F4510   1DC510  4057         ADDC  L5,ZER                 DDDF POINTER
1349 040590   004590  4058         SINC  ZER,L5,0            ZERO EF SENSE BYTE 1
134A 089A05   029A05  4059         SABI  BLOCKB,X'05'        SET BLOCK ADDR BACK TO 05
134B 0A0800   088800  4060         LBI   L8,0                ZERO L8 FOR STORE DDDF SUBRTN
134C 2A2100   18A100  4061         LBI   CCH,0               LOAD CHANNEL
134D 0A3100   08B100  4062         LBI   CCL,0                  COUNTER TO XFER 2 BYTES
134E 0A0400   088400  4063         LBI   L4,0                SET L4 AND L5
134F 0A0502   088502  4064         LBI   L5,2                   TO CHECK CHANNEL COUNTER
1350 000BDE   000BDE  4065         BU    TENSDDDF            GO XFER TO CHANNEL
1351 0011CB   0011CB  4066         BU    TIORDDDR            GO READ DDDR
1352 201EB7   101EB7  4067         BU    TWRCHKDR            GO CHECK DDDR
1353 2010FB   1010FB  4068         BU    TIODDDR1            GO INCREMENT DDDR BY 1
1354 0E2380   08E380  4069         ANDI  DST,IOPBUSY         RESET ATTACHMENT BUSY
1355 2A1100   189100  4070         LBI   CEB1,X'00'          RESET MARKS
1356 2A1400   189400  4071         LBI   MSC2,X'00'          RESET MARKS
1357 0A2300   08A300  4072         LBI   DST,0               RESET DST, SAVE SEEK COMPLETE'S
1358 2A3300   18B300  4073         LBI   DXC,X'00'           RESET DXC
1359 001202   001202  4074         B     TIPIDLE             RETURN TO IDLE LOOP
135A 0A073A   08873A  4075 TRDRSTDM LBI   L7,D(EFSENSEL)     GET EXTENDED FUNCTIONAL
135B 2407C6   1047C6  4076         LINC  L6,L7,0                SENSE BYTE
135C 0011F4   0011F4  4077         BU    TIPBSGEN            GENERATE BSDA IN L3
135D 2E83FF   1AC3FF  4078         EORI  L3,FF               INVERT BSDA FOR RESET
135E 0F0643   0CC643  4079         AND   L6,L3               RESET DM ATTN PENDING
135F 005361   011361  4080         BNZ   *+2                 GO IF MORE DM ATTN PENDING
1360 2E2DDF   18EDDF  4081         ANDI  FTR,FF-DMATTN       RESET DM ATTN INTERRUPT
1361 040786   004786  4082         SINC  L6,L7,0             RESTORE EF SENSE
1362 0E2380   08E380  4083         ANDI  DST,IOPBUSY         RESET ATTACHMENT BUSY
1363 0E137F   08D37F  4084         ANDI  MSC1,FF-RDSNS       RESET READ SENSE CMD MARK
1364 001202   001202  4085         B     TIPIDLE             GO BACK TO IDLE LOOP
1365 2A0003   188003  4086 TRDCOMP  LBI   L0,X'03'           POINT L0 TO 'F' IN DDCF
1366 0A0182   088182  4087         LBI   L1,X'82'           POINT L1 TO 'CC HIGH' IN DDCF
1367 2B051F   1C851F  4088         MV    L5,FFLG             COMPARE FLAG IN DDCF
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1368 0F8555   0EC555  4089          EOR   L5,FLAG              FROM LAST RECORD PROCESSED
1369 0E0503   08C503  4090          ANDI  L5,X'03'               TO FLAG READ FROM RO COUNT
136A 2440C6   1140C6  4091          LINC  L6,LO,1            FETCH CYL LOW FROM DDCF
136B 2F8657   1EC657  4092          EOR   L6,CLO             COMPARE
136C 2F4546   1DC546  4093          OR    L5,L6
136D 24C1C6   1341C6  4094          LINC  L6,L1,3            FETCH CYL HIGH FROM DDCF
136E 0F8656   0EC656  4095          EOR   L6,CHI             COMPARE
136F 2F4546   1DC546  4096          OR    L5,L6
1370 2440C6   1140C6  4097          LINC  L6,LO,1            FETCH HEAD FROM DDCF
1371 2F8658   1EC658  4098          EOR   L6,HEAD            COMPARE
1372 2F4546   1DC546  4099          OR    L5,L6              IF ALL COMPARED, L5 = ZERO
1373 22480D   19080D  4100          BZ    TEFENDRO           GO IF ALL COMPARED
1374 061279   085279  4101          TIBOF READ,CEB2,*+5      GO IF NOT READ CMD
1375 070D79   0C4D79  4102          TBOFF 4,RBYT,*+4         GO IF NOT READ RO K-D CMD
1376 0A0800   088800  4103          LBI   L8,X'00'           POST FORMAT 0 MSG 0
1377 0A0714   088714  4104          LBI   L7,X'14'           POST NOT RECORD FOUND
1378 201908   101908  4105          B     TSNNORM            GO ASSEMBLE SENSE INFO
1379 200870   100870  4106          B     TEFINVTK           GO POST INVALID TRACK FORMAT
                    4107          MBLOK
137A 20137A   10137A  4108+         B     *                  UNUSED  ::::::::::::
137B 00137B   00137B  4109+         B     *                  UNUSED  ::::::::::::
137C 20137C   10137C  4110+         B     *                  UNUSED  ::::::::::::
137D 00137D   00137D  4111+         B     *                  UNUSED  ::::::::::::
137E 00137E   00137E  4112+         B     *                  UNUSED  ::::::::::::
137F 20137F   10137F  4113+         B     *                  UNUSED  ::::::::::::
1400                  4114+         DS    <0>B
                    4115 ************************************************************
                    4116 *  ENTRY FOR READ HOME ADDRESS & RO COUNT EVEN/ODD
                    4117 ************************************************************
                    4118 *
1400 2018F0   1018F0  4119 TRDHAROE BU    TWREVNHD           SET EVEN HEAD
1401 201403   101403  4120          B     *+2                CONTINUE
1402 2018F3   1018F3  4121 TRDHAROD BU    TWRODDHD           SET ODD HEAD
1403 200780   100780  4122          BU    TEFSETRW           SET READ/WRITE TAG
1404 2E5188   19D188  4123          ORI   CEB1,PROCRO+ROCTODF   PROCESS RO COUNT, RO COUNT TO DDDF
1405 2E4918   19C918  4124          ORI   GEN1,XFRHACNT+XFRDDDF   SET MARKS FOR END PROCEDURE
1406 001449   001449  4125          B     TRDRDHA            GO TO READ HA AND END OF FIELD PROC
                    4126 ****************************************
                    4127 *  ENTRY FOR READ RO KEY-DATA ODD
                    4128 ****************************************
                    4129 *
1407 2018F3   1018F3  4130 TRDROKDO BU    TWRODDHD           SET ODD HEAD
1408 2F9959   1ED959  4131          EOR   REC,REC            SET RECORD NUMBER TO ZERO
1409 200780   100780  4132          BU    TEFSETRW           GO SET R/W TAG
140A 2E5103   19D103  4133          ORI   CEB1,PROCKEY+PROCDAT   PROCESS KEY AND DATA FIELDS
140B 2E4928   19C928  4134          ORI   GEN1,FIXDDCF+XFRDDDF   SET MARKS FOR END PROCEDURE
140C 201448   101448  4135          B     TRDUSHA            GO TO READ HA
                    4136 ************************************************************
                    4137 *  ENTRY FOR READ KEY-DATA, READ VERIFY KEY-DATA
                    4138 ************************************************************
                    4139 *
140D 2B061C   1C861C  4140 TRDKD     MV    L6,NREC            SET NUMBER OF RECORDS FOR SUBROUTINE
140E 079410   0E5410  4141          TIBOF KDGT256,MSC2,*+2   GO IF (KL+DL) NOT > 256
140F 20181B   10181B  4142 TRDINVCF B     TSKINVSK           GO SET UP CMD REJECT ERROR
1410 001E80   001E80  4143          BU    TWRCHCNT           GO SET CCH AND CCL
1411 0E4940   09C940  4144          ORI   GEN1,FINCHXFR      FINISH CHANNEL TRANSFER MARK
                    4145 *--->DECREMENT THE CHANNEL TRANSFER COUNT BY 1 IF COUNT>1 AND
                    4146 *     THE LAST BYTE TO BE TRANSFERRED IS ON THE EVEN SIDE OF C STOKE
1412 05881C   0681C  4147          TBON  6,L8,TRDSDXFR      GO IF TRANSFER COUNT IS 1
1413 049416   025416  4148          TIBON DDDRODD,MSC2,*+3   GO IF DDDR ALIGNMENT IS ODD
1414 25C517   174517  4149          TBON  7,L5,TRDDOWN1      ALIGNMENT EVEN, GO IF COUNT IS ODD
1415 00141C   00141C  4150          B     TRDSDXFR           ALIGNMENT EVEN, COUNT IS EVEN
1416 05C51C   07451C  4151          TBON  7,L5,TRDSDXFR      ALIGNMENT ODD, GO IF COUNT IS ODD
1417 2A00FF   1880FF  4152 TRDDOWN1 LBI   L0,FF               SET UP WORK REG
1418 2F0500   1CC500  4153          ADD   L5,L0              SUBTRACT 1 FROM
1419 2F4400   1DC400  4154          ADDC  L4,L0                CHANNEL COUNT
141A 2B3105   1CB105  4155          MV    CCL,L5             MOVE FINAL VALUE TO
141B 2B2104   1CA104  4156          MV    CCH,L4               CHANNEL COUNTER
                    4157 *
141C 2E0803   18C803  4158 TRDSDXFR ANDI  L8,X'03'            MASK L8 FOR FOLLOWING SUBROUTINE
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

141D 0008DE   0008DE  4159          BU    TENSDDDF           START DATA TRANSFER TO CHANNEL
141E 2E5103   19D103  4160 TRDVKD   ORI   CEB1,PROCKEY+PROCDAT   PROCESS KEY AND DATA FIELDS
141F 201BEE   101BEE  4161          BU    TWRSETHD           GO SET HEAD
1420 200780   100780  4162          BU    TEFSETRW           GO SET RD/WR TAG
1421 0E4920   09C920  4163          ORI   GEN1,FIXDDCF       RESTORE DDCF MARK FOR END PROC
1422 0E5360   09D360  4164          ORI   MSC1,MUTRK+MUREC   MULTIPLE TRACK, MULTIPLE RECORD
1423 001440   001440  4165          B     TRDRDKD            GO TO SEARCH FOR COUNT FIELD
                    4166 ************************************************************
                    4167 *  ENTRY FOR READ COUNT-KEY-DATA  DIAGNOSTIC CMD
                    4168 ************************************************************
                    4169 *
1424 05940F   06540F  4170 TRDCKDD  TIBON KDGT256,MSC2,TRDINVCF  GO IF (KL+DL)  > 256
1425 075527   0D5527  4171          TIBOF CMPDAT,FLAG,*+2      GO IF NOT COMPRESSED FORMAT  -<GHD>-
1426 07D40F   0F540F  4172          TIBOF DL256,MSC2,TRDINVCF GO IF DATA LENGTH NOT 256    -<GHD>-
1427 2018F0   1018F0  4173          BU    TWREVNHD           SET EVEN HEAD
1428 200780   100780  4174          BU    TEFSETRW           SET READ/WRITE TAG
1429 200280   100280  4175          BU    TDSDCON            SET UP CONSTANTS FOR DEFECT SKIP
142A 2A0088   188088  4176          LBI   LO,D(ORGREC)       SET CS POINTER TO ORIGINAL REC
142B 040099   004099  4177          SINC  REC,LO,0           SAVE ORIGINAL REC NUMBER
142C 2E490A   19C90A  4178          ORI   GEN1,UPDTRDUS+XFRDDDF  SET END PROCEDURE MARKS
142D 2E5147   19D147  4179          ORI   CEB1,PROCNT+PROCKEY+PROCDAT+FMTWR   SET XEQION MARKS
142E 2E52C0   19D2C0  4180          ORI   CEB2,READ+SRCH       SET READ AND SEARCH
142F 24D933   135933  4181          TBON  3,REC,TRDNRO         GO IF NOT RO
1430 2E910C   1AD10C  4182          EORI  CEB1,PROCNT+PROCRO   SET PROC RO CNT INSTEAD OF REG CNT
1431 2E128F   18D28F  4183          ANDI  CEB2,FF-SRCH         TURN OFF SEARCH BIT
1432 201436   101436  4184          B     TRDDGN               GO WAIT FOR R/W END AND READ G1
1433 2ED9FF   1BD9FF  4185 TRDNRO   ADDI  REC,-1               DECR REC BY 1 FOR SEARCHING
1434 075536   0D5536  4186          TIBOF CMPDAT,FLAG,TRDDGN   GO IF NOT COMPRESSED FORMAT
1435 2E19FC   18D9FC  4187          ANDI  REC,X'FC'            ADJUST REC TO ONE BEFORE COUNT
1436 2014D4   1014D4  4188 TRDDGN   BU    TRDRWEND           WAIT FOR END OF SET R/W TAG
1437 201C4A   101C4A  4189          B     TWRRDG1            GO READ HA
                    4190 ************************************************************
                    4191 *  ENTRY FOR READ COUNT-KEY-DATA
                    4192 ************************************************************
                    4193 *
1438 2018EE   1018EE  4194 TRDCKD    BU    TWRSETHD           SET HEAD
1439 200780   100780  4195          BU    TEFSETRW           SET READ/WRITE TAG
143A 0E491A   09C91A  4196          ORI   GEN1,XFRHACNT+XFRDDDF+UPDTRDUS   SET END PROCEDURE MARKS
143B 2E5103   19D103  4197          ORI   CEB1,PROCKEY+PROCDAT   PROCESS KEY AND DATA
143C 2E52C0   19D2C0  4198          ORI   CEB2,READ+SRCH       SET READ AND SRCH MARK
143D 2A0024   188024  4199          LBI   LO,D(CNTCNTR)        ZERO OUT COUNT
143E 040090   004090  4200          SINC  ZER,LO,0               COUNTER
143F 201436   101436  4201          B     TRDDGN               GO READ HA ON ACTIVE TRACK
1440 0E5280   09D280  4202 TRDRDKD  ORI   CEB2,READ            READ OP MARK
1441 2E5244   19D244  4203 TRDSCSRH ORI   CEB2,SRCH+ENDCNT     SEARCH, ORIENT TO END OF COUNT FIELD
1442 2014D4   1014D4  4204          BU    TRDRWEND           WAIT FOR END OF SET READ/WRITE TAG
1443 0E4902   09C902  4205          ORI   GEN1,UPDTRDUS       MARK FOR UPDATE READ USAGE COUNTER
1444 2A2E7D   18AE7D  4206 TRDG3AM  LBI   FBO,RDG3AM+13       SET FBO FOR RD G3 AM
1445 0A070C   08870C  4207          LBI   L7,12                FILE COUNT FOR SEARCH AM
1446 20144D   10144D  4208          B     TRDCKDEN             CONTINUE
1447 0E510B   09010B  4209 TRDRZERO ORI   CEB1,PROCRO+PROCKEY+PROCDAT  PROCESS RO COUNT,KEY,DATA
1448 0E4902   09C902  4210 TRDUSHA  ORI   GEN1,UPDTRDUS       UPDATE READ USAGE COUNTER MARK
1449 0E5280   09D280  4211 TRDRDHA  ORI   CEB2,READ            READ OP MARK
144A 2014D4   1014D4  4212 TRDSCHA  BU    TRDRWEND           WAIT FOR END OF SET READ/WRITE TAG
144B 0A2E49   08AE49  4213 TRDRDG1  LBI   FBO,RDG1+9          SET BUS OUT FOR READ G1
144C 2A0708   188708  4214          LBI   L7,8                 FILE COUNT FOR READ HA
144D 2A260E   18A60E  4215 TRDCKDEN LBI   FTO,READOP          READ TAG
144E 2E33DF   18F3DF  4216 TRDENTRY ANDI  DXC,FF-LSRCSR      SET DATA CYCLE STEAL REQUEST
144F 2A0000   188000  4217          LBI   LO,D(DDCFORGL)       SDH DISPLACEMENT TO LO
1450 2A0180   188180  4218          LBI   L1,D(DDCFORGR)       SDL DISPLACEMENT TO L1
1451 0E6D01   09ED01  4219          ORI   FTR,ALLOWIDX         ENABLE INDEX DETECTION
1452 0A04A0   0884A0  4220 TRD11MS  LBI   L4,-96                LOAD 11 MSEC TIMER
1453 00070C   00070C  4221          B     TEFWAIT              GO TO END OF FIELD PROCESSING
                    4222 ************************************************************
                    4223 *  SUBROUTINE TO WAIT FOR END OF SET READ/WRITE FILE OP
                    4224 ************************************************************
                    4225 *
1454 0ED001   0BD001  4226 TRDRWEND ADDI  ZER,1               INCREMENT TIMER
1455 029457   0A1457  4227          BNC   TRDRWAIT             GO IF TIMEOUT HAS NOT OCCURRED
1456 20072A   10072A  4228          B     TEFNOREP             TIMEOUT ERROR EXIT HERE **********
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1457 273554   1C7554  4229 TRDRWAIT TIBOF NORMEND,FTI,TRDRWEND  GO IF NO NORMAL END
1458 2E6508   19E508  4230          ORI   FTG,RESPONSE          GENERATE RESPONSE
1459 0E25F7   08E5F7  4231          ANDI  FTG,255-RESPONSE      RESET RESPONSE
145A 0E4904   09C904  4232          ORI   GEN1,SETRWON          SET MARK FOR SET READ/WRITE ACTIVE
145B 0F90D0   0ED0D0  4233          EORU  ZER,ZER               RETURN
                     4234 *
                     4235 ************************************************
                     4236 *  THIS ROUTINE READS  RO/RN  COUNT FIELD
                     4237 ************************************************
                     4238 *
145C 0E2F40   08EF40  4239 TRDCOUNT ANDI  SCN,X'40'              RESET FILE DATA XFER CONTROLS
145D 2E33FB   18F3FB  4240          ANDI  DXC,FF-ALOWFILE       RESET ALLOW DIFF CNTR FILE
145E 061F60   085F60  4241          TIBOF DEFCNT,FFLG,*+2       GO IF COUNT NOT MOVED
145F 0001E8   0001E8  4242          BU    TDSRDG4               GO READ  G4 GAP
1460 2A260E   18A60E  4243          LBI   FTO,READOP            SET READ OP
1461 0A2E5D   08AE5D  4244          LBI   FBO,RDG3+13           SET READ  G3 WITH LENGTH OF 13
1462 05D264   075264  4245          TBON  7,CEB2,*+2            GO IF AFTER DATA FIELD
1463 0A2E6D   08AE6D  4246          LBI   FBO,RDG2+13           SET READ  RO COUNT
1464 28D14A   13914A  4247          SZI   ZLSFC,ZLSRFILE        SET ZLS TO STORE (DDCF)
1465 041172   005172  4248          TIBON ROCTODF,CEB1,TRDMOSP+1   GO IF READ HA/RO CNT CMD
1466 065271   095271  4249          TIBOF SRCH,CEB2,TRDNOSP     GO IF NOT SEARCHING
1467 2A0024   188024  4250          LBI   LO,D(CNTCNTR)         GET COUNT
1468 2400C4   1040C4  4251          LINC  L4,LO,0                  COUNTER
1469 0EC401   08C401  4252          ADDI  L4,1                  BUMP COUNTER BY 1
146A 260D70   184D70  4253          TBOFF 0,RBYT,TRDSTCNT       GO IF IGNORE CNT DATA CHK MK NOT ON
146B 0EC4FE   08C4FE  4254          ADDI  L4,X'FE'              EFFECTIVELY DECREMENT COUNTER BY 1
146C 04C470   034470  4255          TBON  3,L4,TRDSTCNT         GO IF COUNTER NOT ZERO
146D 0001E8   0001E8  4256          BU    TDSRDG4               DELAY PASS THE BAD COUNT FIELD
146E 040084   004084  4257          SINC  L4,LO,0               STORE COUNTER
146F 201444   101444  4258          B     TRDG3AM               GO READ G3 AM SEARCH OP
1470 040084   004084  4259 TRDSTCNT SINC  L4,LO,0               STORE COUNTER
1471 201D0F   101D0F  4260 TRDNOSP  B     TWRCOM1               GO TO COMMON RTN TO SET XFER CNTLS
1472 28D24A   13924A  4261          SZI   ZLSFD,ZLSRFILE        SET ZLS TO STORE (DDDF)
1473 088540   028540  4262          SABI  INDEXF1,IDXDDDF       SET INDEX TO POINT TO DDDF
1474 288740   128740  4263          SABI  INDEXF2,IDXDDDF                 ''
1475 08AA00   02AA00  4264          SADI  DISPFD,D(DDDFORG)     SET CS DISPLACEMENT TO DDDF
1476 069478   0A5478  4265          TIBOF DDDRODD,MSC2,*+2      GO IF NOT ODD ADDRESS BOUNDARY
1477 2E6F04   19EF04  4266          ORI   SCN,FILEODD           TURN ON FILE ODD XFER
1478 201D12   101D12  4267          B     TWRCOM2               GO TO LOAD FCT
                     4268 *
1479 2A0005   188005  4269 TRDODTRK LBI   LO,X'05'              POINT LO TO KL
147A 2A0185   188185  4270          LBI   L1,X'85'              POINT L1 TO DL HIGH
147B 2802B0   1002B0  4271          BU    TDSUPTRK              GO UPDATE TRK CAPACITY COUNTER
147C 20154A   10154A  4272          B     TRDSPKEY              GO SPACE OVER KEY FIELD
                     4273          MBLOK
147D 20147D   10147D  4274+         B     *                     UNUSED  ::::::::::::
147E 20147E   10147E  4275+         B     *                     UNUSED  ::::::::::::
147F 00147F   00147F  4276+         B     *                     UNUSED  ::::::::::::
1500                 4277+         DS    <0>B
                     4278 ************************************************************
                     4279 *   T A G    S U B R O U T I N E
                     4280 ************************************************************
                     4281 *
1500 0A2605   08A605  4282 TRDOPDWN LBI   FTO,RSTRDWR           OP DOWN TAG
1501 2A2E00   18AE00  4283          LBI   FBO,0                 ZERO FBO
1502 001335   001335  4284          B     TIPNOCHK              BR AROUND FOR NO CHECKING
1503 2E6501   19E501  4285 TRDSBTIM ORI   FTG,X'01'             ALLOW FBI CHECK
1504 2E6580   19E580  4286 TRDNOFBI ORI   FTG,X'80'             RAISE TAG GATE
1505 0A10FA   0890FA  4287          LBI   ZER,250               SET TIMER FOR 5 US
1506 0ED001   0BD001  4288 TRD5US   ADDI  ZER,1                 INCR TIMER
1507 22950B   1A150B  4289          BNC   TRDSKP                GO IF NOT TIME OUT
1508 0E257F   08E57F  4290          ANDI  FTG,X'7F'             DROP TAG GATE
1509 0A0403   088403  4291          LBI   L4,3                  SET SENSE BYTE 18
150A 200707   100707  4292          B     TEFNRERR              GO POST NO RESPONSE ERROR
150B 067506   097506  4293 TRDSKP   TBOFF 1,FTI,TRD5US          GO IF NO TAG VALID
150C 073506   0C7506  4294          TBOFF 4,FTI,TRD5US          GO IF NO NORMAL END
150D 2E6510   19E510  4295 TRDRDFBI ORI   FTG,X'10'             GATE BUS IN TO FI
150E 2E256F   18E56F  4296          ANDI  FTG,X'6F'             DROP GATE BIT+TAG GATE
150F 08A200   0CA200  4297          MV    FBI,DUMMY             GATE FI TO FBI
1510 26661B   19661B  4298          TBOFF 1,FTO,TRDNOP          GO IF NOT SPECIAL TAG
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1511 056616   056616  4299          TBON  5,FTO,TRDCPHAR        GO IF SENSE HAR TAG
1512 28042E   1C842E  4300          MV    L4,FBO                SAVE EXPECTED HAR IN L4
1513 2A26EF   18A6EF  4301          LBI   FTO,X'EF'             LOAD XMIT CONTROL TAG
1514 2A2E05   18AE05  4302          LBI   FBO,X'05'             LOAD SENSE HAR MODIFIER
1515 001503   001503  4303          B     TRDSBTIM              TAG SUBROUTINE
                     4304 *
1516 2DA244   16E244  4305 TRDCPHAR TEOR  FBI,L4                COMPARE HAR
1517 025518   091518  4306          BZ    TRDNOP                RETURN TO CALLING RTN IF NO ERROR
1518 0A0817   088817  4307          LBI   L8,X'17'              SET XMIT HAR ERROR
1519 2B2E04   1CAE04  4308          MV    FBO,L4                EXPECTED HAR TO FBO
151A 200708   100708  4309          B     TEFL703               GO POST EQUIPMENT CHECK
151B 0E256E   08E56E  4310 TRDNOP   ANDI  FTG,X'6E'             DROP GATE BIT+TAG GATE+ALLOW FBI CHK
151C 0F90D0   0ED0D0  4311          EORU  ZER,ZER               RETURN
                     4312 ****************************************
                     4313 *      THIS ROUTINE READS KEY FIELD
                     4314 ****************************************
                     4315 *
151D 2E11FD   18D1FD  4316 TRDKEY   ANDI  CEB1,FF-PROCKEY       TURN OFF PROCESS KEY MARK
151E 0E2F40   08EF40  4317          ANDI  SCN,X'40'             TURN OFF FILE DATA XFER CONTROLS
151F 2E12F8   18D2F8  4318          ANDI  CEB2,X'F8'            UPDATE TRACK ORIENT
1520 0E5202   09D202  4319          ORI   CEB2,ENDKEY              TO END OF KEY FIELD
1521 088540   028540  4320          SABI  INDEXF1,IDXDDDF       SET PGM POINTER TO DDDF
1522 288740   128740  4321          SABI  INDEXF2,IDXDDDF                 ''
1523 27C925   1F4925  4322          TBOFF 7,GEN1,*+2             GO IF NOT ODD ADDR BOUNDARY
1524 2E6F04   19EF04  4323          ORI   SCN,FILEODD           SET FILE ODD XFER
1525 24CD27   134D27  4324          TBON  3,RBYT,*+2            GO IF NOT READ K-D COMMAND
1526 0E73C4   09F3C4  4325          ORI   DXC,ALOWFILE          SET ALLOW DIFF COUNTER FILE
1527 28D24A   13924A  4326          SZI   ZLSFD,ZLSRFILE        SET ZLS TO STORE
1528 06DA3F   0B5A3F  4327          TBOFF 3,KCNT,TRDDATA        GO TO READ  DATA IF KCNT = 0
1529 08071A   0C871A  4328          MV    L7,KCNT               COPY KCNT
152A 065F31   095F31  4329          TIBOF DEFKEY,FFLG,TRDNODEF GO IF NO DEFECT IN KEY
152B 26DE30   1B5E30  4330 TRDCHKSP TBOFF 3,SDL,TRDNOSPL        GO IF FIELD IS NOT SPLIT
152C 0A06E0   0886E0  4331 TRDSPLIT LBI   L6,SPRDG2            SET UP READ MODIFIER
152D 2B071E   1C871E  4332          MV    L7,SDL                GET FIRST SEGMENT LENGTH
152E 0E5204   09D204  4333          ORI   CEB2,X'04'            OR IN END OF FIRST SEGMENT MARK
152F 201532   101532  4334          B     TRDCNTR               GO TO COMMON RTN TO HANDLE SPLIT FLD
1530 0001E8   0001E8  4335 TRDNOSPL BU    TDSRDG4               GO READ  G4 FOR MOVED FIELD
1531 2A0660   188660  4336 TRDNODEF LBI   L6,RDG2               SET UP READ  MODIFIER
1532 2A0216   188216  4337 TRDCNTR  LBI   L2,D(BYTEREAD)        SET CS PNTR TO READ COUNTER
1533 0442C3   0142C3  4338          LINC  L3,L2,1               FETCH READ
1534 07C2C4   0F42C4  4339          LDEC  L4,L2,1                  USAGE COUNTER
1535 0C07FF   00C7FF  4340          TANDI L7,FF                 IF FIELD LENGTH NOT 256
1536 005538   011538  4341          BNZ   *+2                      SKIP NEXT INSTURCTION
1537 2EC301   1BC301  4342          ADDI  L3,1                  UPDATE READ USAGE COUNTER BY 256R
1538 2F0407   1CC407  4343          ADD   L4,L7                 INCREMENT READ
1539 2F4310   1DC310  4344          ADDC  L3,ZER                   USAGE COUNTER
153A 02953C   0A153C  4345          BNC   *+2                   GO IF NOT OVERFLOW
153B 0E5402   09D402  4346          ORI   MSC2,KDGT256          TURN ON OVERFLOW MARK
153C 244283   114283  4347          SINC  L3,L2,1               STORE READ
153D 240284   104284  4348          SINC  L4,L2,0                  USAGE COUNTER
153E 001D37   001D37  4349          B     TWRRWCOM              GO SET XFER CONTROLS
                     4350 ****************************************
                     4351 *      THIS ROUTINE READS DATA FIELD
                     4352 ****************************************
                     4353 *
153F 2E11FE   18D1FE  4354 TRDDATA  ANDI  CEB1,FF-PROCDAT       TURN OFF PROCESS DATA MARK
1540 2E5203   19D203  4355          ORI   CEB2,ENDDAT           SET TRK ORIENT TO END OF DATA
1541 271443   1C5443  4356          TIBOF DLO,MSC2,*+2          GO IF DATA LENGTH NOT ZERO
1542 0A1B01   089B01  4357          LBI   DCNT,1                FORCE DCNT TO 1
1543 2B071B   1C871B  4358          MV    L7,DCNT               COPY DATA LENGTH
1544 27C946   1F4946  4359          TBOFF 7,GEN1,*+2             GO IF NOT ODD ADDR BOUNDARY
1545 2E6F04   19EF04  4360          ORI   SCN,FILEODD           SET FILE ODD XFER
1546 069F31   0A5F31  4361          TIBOF DEFDAT,FFLG,TRDNODEF  GO IF NO DEFECT IN DATA
1547 26DD2B   1B5D2B  4362          TBOFF 3,SDH,TRDCHKSP        GO IF DEFECT IN NEXT FIELD    -<CD>-
1548 0EDDFF   0BDDFF  4363          ADDI  SDH,-1                DECREMENT SD HIGH             -<CD>-
1549 201531   101531  4364          B     TRDNODEF              NO DEFECT IN NEXT DATA FIELD  -<CD>-
                     4365 ************************************************
                     4366 *      THIS ROUTINE SPACES OVER KEY FIELD
                     4367 ************************************************
                     4368 *
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

154A 2A0005  188005  4369 TRDSPKEY LBI   LO,X'05'          SET LO POINTING TO KCNT
154B 0440C7  0140C7  4370          LINC  L7,L0,1           FETCH KL
154C 2E12F8  18D2F8  4371          ANDI  CEB2,X'F8'        UPDATE TRACK ORIENTATION
154D 06C75A  08475A  4372          TBOFF 3,L7,TRDSPKLO     GO SPACE DATA IF KL=0
154E 0E5202  09D202  4373          ORI   CEB2,ENDKEY         TO END OF KEY FIELD
154F 065F51  095F51  4374          TIBOF DEFKEY,FFLG,*+2   GO IF NO DEFECT IN KEY
1550 0001E8  0001E8  4375 TRDEXTG4 BU    TDSRDG4           GO EXTEND GAP BY 128 BYTES
1551 0E2F40  08EF40  4376 TRDSPCOM ANDI  SCN,X'40'        RESET FILE XFER CONTROLS
1552 2E33FB  18F3FB  4377          ANDI  DXC,FF-ALOWFILE   RESET ALLOW DIFF CNTR FILE
1553 2E6F01  19EF01  4378          ORI   SCN,NFILEXFR      SET INHIBIT FILE TO CS XFER
1554 2A260E  18A60E  4379          LBI   FTO,READOP        SET READ OP
1555 2B2E07  1CAE07  4380          MV    FBO,L7            LOAD MOD 16 COUNT TO FBO
1556 0E2E0F  08EE0F  4381          ANDI  FBO,X'0F'
1557 0E6E20  09EE20  4382          ORI   FBO,CLKG2         SET READ MODIFIER TO CLOCK G2
1558 001D3D  001D3D  4383          B     TWRLDFCT          GO LOAD FILE BYTE COUNTER
                     4384 ***********************************************
                     4385 *     THIS ROUTINE SPACES OVER DATA FIELD
                     4386 ***********************************************
                     4387 *
1559 2A0006  188006  4388 TRDSPDAT LBI   LO,X'06'          INITIALIZE LO POINTING TO DL LOW
155A 2A0185  188185  4389 TRDSPKLO LBI   L1,X'85'          INITIALIZE L1 POINTING TO DL HIGH
155B 27C0C7  1F40C7  4390          LDEC  L7,L0,1           FETCH DL LOW
155C 06C1C6  0B41C6  4391          LDEC  L6,L1,5           FETCH DL HIGH
155D 2CC6FF  13C6FF  4392          TADDI L6,FF             CHECK DL HIGH
155E 000569  031569  4393          BCN   TRDINVTK          GO IF DL HIGH IS >256
155F 05926A  06526A  4394          TBON  6,CEB2,TRDKNTO    GO IF END OF KEY (KL MUST NOT =0)
1560 04C768  034768  4395 TRDCHKO  TBON  3,L7,TRDDLNTO     GO IF DL LOW NOT ZERO
1561 04C663  034663  4396          TBON  3,L6,TRDSPNTO     GO IF DL HI NOT ZERO
1562 2A0701  188701  4397 TRDSPDLO LBI   L7,1              SET DATA LENGTH TO 1
1563 2E5203  19D203  4398 TRDSPNTO ORI   CEB2,ENDDAT       SET TRK ORIENT TO END OF DATA
1564 069F51  0A5F51  4399          TIBOF DEFDAT,FFLG,TRDSPCOM  GO IF NO DEFECT IN DATA     -<CD>-
1565 26DD50  1B5D50  4400          TBOFF 3,SDH,TRDEXTG4    GO IF DEFECT IN NEXT FIELD    -<CD>-
1566 0EDDFF  0BDDFF  4401          ADDI  SDH,-1            DECREMENT SD HIGH             -<CD>-
1567 201551  101551  4402          B     TRDSPCOM          NO DEFECT IN NEXT DATA FIELD  -<CD>-
1568 26C663  1B4663  4403 TRDDLNTO TBOFF 3,L6,TRDSPNTO     GO IF DL HIGH IS ZERO
1569 200870  100870  4404 TRDINVTK B     TEFINVTK          GO POST INVALID TRK FMT ERROR
156A 0400C5  0040C5  4405 TRDKNTO  LINC  L5,LO,0          FETCH KL
156B 2D0507  14C507  4406          TADD  L5,L7             CHECK KL+DL LOW
156C 000569  031569  4407          BCN   TRDINVTK          GO IF GREATER THAN 256
156D 009568  021568  4408          BCY   TRDDLNTO          GO DL LOW NOT ZERO
156E 04C669  034669  4409          TBON  3,L6,TRDINVTK     GO IF DL HIGH IS NOT ZERO
156F 001560  001560  4410          B     TRDCHKO           GO CHECK DL FOR ZERO
                     4411 *
                     4412 *     SUBROUTINE TO ADJUST DDCS TO EVEN(MEVEN) OR ODD(MODD) BOUNDRY
                     4413 *
1570 0A0001  088001  4414 TRDMEVEN LBI   LO,D(DDCFORGL+1)  SET ADDRESS OF SDL
1571 08C60C  03860C  4415          SZI   ZLSLOCB,X'0C'     SET ACCESS TO 16 WORK STORES
1572 289A85  129A85  4416          SABI  BLOCKB,B(DDCFORGL+X'8000') MULTI-BYTE FETCH STORE MODE
1573 07C0D1  0F40D1  4417          LDEC  W1,LO,1           FETCH 7 BYTES TO W1-W7 USING LO
1574 201579  101579  4418          B     TRDFUPCF          GO TO COMMON CODE TO FINISH UP
1575 2A0000  188000  4419 TRDMODD  LBI   LO,D(DDCFORGL)    SET ADDRESS OF SDH
1576 08C60C  03860C  4420          SZI   ZLSLOCB,X'0C'     SET ACCESS TO 16 WORK STORES
1577 289A85  129A85  4421          SABI  BLOCKB,B(DDCFORGL+X'8000') MULTI-BYTE FETCH/STORE MODE
1578 2440D1  1140D1  4422          LINC  W1,LO,1           FETCH 7 BYTES TO W1-W7 USING LO
1579 2A0180  188180  4423 TRDFUPCF LBI   L1,D(DDCFORGR)    SET ADDRESS OF SDL(EVEN) OR SDH(ODD)
157A 0401D9  0041D9  4424          LINC  W9,L1,0           FETCH 7 BYTES TO W9-W15 USING L1
157B 040099  004099  4425          SINC  W9,LO,0           STORE 7 BYTES FROM W9-W15 USING LO
157C 040191  004191  4426          SINC  W1,L1,0           STORE 7 BYTES FROM W1-W7 USING L1
157D 089A05  029A05  4427          SABI  BLOCKB,B(DDCFORGL) RESTORE SINGLE BYTE FETCH/STORE MODE
157E 28C608  138608  4428          SZI   ZLSLOCB,X'08'     RESTORE NORMAL DLS ACCESS
157F 0F90D0  0ED0D0  4429          EORU  ZER,ZER           RETURN
                     4430          MBLOK
1600                 4431+         DS    <0>B
                     4432          END COPY-MEMBER TRD12
                     4433     COPY      TSC12
                     4434 ***************************************************************
                     4435 *     ENTRY TO SCAN, SCAN READ 'OR' DATA EQUAL, HIGH OR EQUAL
                     4436 ***************************************************************
                     4437 *
1600 2A0804  188804  4438 TSCOR    LBI   L8,X'04'          INDICATE 256 BYTE TRANSFER
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1601 2A31FE  1881FE  4439          LBI   CCL,X'FE'         SET CHANNEL COUNTER TO 254
1602 2A2100  18A100  4440          LBI   CCH,X'00'           ALSO SET CCH
1603 001DD5  001DD5  4441          BU    TWRFDDDF          GO FETCH DDDF
1604 050D0C  044D0C  4442          TBON  4,RBYT,TSCANRD    GO IF COMMAND IS SCAN READ  -<GHD>-
                     4443 *
                     4444 *    FOR SCAN COMMANDS CHECK AND RESTORE DDDR
1605 0B0208  0CE208  4445          MV    L2,L8             SAVE CNTRL BYTE FOR CHNL CNTR>-
1606 0A0400  088400  4446          LBI   L4,X'00'          SET DDDR INCREMENT-1 FOR     -<GHD>-
1607 0A05FE  0885FE  4447          LBI   L5,X'FE'            TWRCHEDR SUBROUTINE        -<GHD>-
1608 0A086C  08886C  4448          LBI   L8,D(TWRTSCA1)    RETURN DISPL FOR SUBROUTINE -<GHD>-
1609 201E5C  101E5C  4449          B     TWRCHEDR          GO CHECK AND RESTORE DDDR    -<GHD>-
                     4450 *
160A 278D4C  1E4D4C  4451 TSCTWRB1 TBOFF 6,RBYT,TSCORE     GO IF COMMAND IS SCAN EQUAL -<GHD>-
160B 00164B  00164B  4452          B     TSCORH            DO NOT SCAN DDDF FOR 'FF'   -<GHD>-
                     4453 *
                     4454 *    FOR SCAN READ COMMANDS CHECK DDDR AND SCAN DDDF FOR FIRST 'FF'
160C 2010FB  1010FB  4455 TSCANRD  BU    TIODDDR1          INCREMENT DDDR 1 & FETCH NEW VALUE
160D 2A0401  188401  4456          LBI   L4,X'01'          SET TO 257 TO CHECK DDDR INCREMENT
160E 0A0501  088501  4457          LBI   L5,X'01'            (TWRCHKDR DECREMENTS COUNT BY 1)
160F 201EB7  101EB7  4458          BU    TWRCHKDR          GO MAKE SURE IT IS
                     4459 *    SCAN DDDF FOR THE FIRST 'FF', DECREMENT DDDR AND SET CCH AND CCL
                     4460 *
1610 089A06  029A06  4461          SABI  BLOCKB,B(DDDFORG)   SET BASE BLOCK IN ALS TO DDDF BUFFER
1611 2A018C  188180  4462          LBI   L1,X'80'          SET L7 POINTER TO FIRST RIGHT BYTE
1612 0A0200  088200  4463          LBI   L2,X'00'          DEFAULT DDDR DIFFERENCE IS ZERO
1613 2A0500  188500  4464          LBI   L5,X'00'          DEFAULT CCL IS 'GO'
1614 0A0800  088800  4465          LBI   L8,X'00'          SET L8 FOR 2-255 BYTE XFR
1615 049426  025426  4466          TIBON DDDRODD,MSC2,TSCDFODD   GO IF FIRST BYTE IN RIGHT HALF
                     4467 *    COME HERE IF BUFFER IS ON EVEN BOUNDARY
                     4468 *
1616 2A0000  188000  4469          LBI   LO,X'00'          SET L6 POINTER TO FIRST BYTE
1617 2016A2  1016A2  4470 TSCEVN   BU    TSCFETCH          FETCH 2 BYTES FROM THE DDDF BUFFER
1618 04C618  034618  4471          TBON  3,L6,TSCARND      GO IF 'FF' NOT FOUND IN L6
1619 0E5480  09D480  4472          ORI   MSC2,SCANSW       TURN ON 258 BYTE XFER SWITCH
161A 00163A  00163A  4473          B     TSCCALC           CONTINUE
161B 04C11F  03411F  4474 TSCARND  TBON  3,L1,TSCCHKL7     GO IF NOT LAST BYTE
161C 26C734  1B4734  4475          TBOFF 3,L7,TSC1BYT      GO IF 'FF' FOUND AT END OF FIELD
161D 2A0801  188801  4476 TSCEOF   LBI   L8,X'01'          ZERO BYTE XFR,NO 'FF' FOUND IN FIELD
161E 001641  001641  4477          B     TSCFDONE          EXIT NOW
161F 24C717  134717  4478 TSCCHKL7 TBON  3,L7,TSCEVN       CONTINUE SEARCHING IF 'FF' NOT IN L7
1620 2A05FF  1885FF  4479          LBI   L5,X'FF'          'FF' FOUND, CCL MUST BE DECREMENTED
1621 00163A  00163A  4480          B     TSCCALC           PROCEED TO CALCULATE DISPLACEMENT
                     4481 *
                     4482 *    SUBROUTINE TO FETCH 2 BYTES FROM DDDF BUFFER
                     4483 *
1622 2440C6  1140C6  4484 TSCFETCH LINC  L6,LO,1          LOAD BYTE FROM LEFT HALF OF BUFFER
1623 2441C7  1141C7  4485          LINC  L7,L1,1          LOAD BYTE FROM RIGHT HALF OF BUFFER
1624 2EC601  1BC601  4486          ADDI  L6,1             INCREMENT BOTH VALUES TO MAKE
1625 0FC790  0FC790  4487          ADD1U L7,ZER             LATER TESTS FOR 'FF' EASY, RETURN
                     4488 *    COME HERE IF BUFFER IS ON ODD BOUNDARY
                     4489 *
1626 0A0001  088001  4490 TSCDFODD LBI   LO,X'01'          SET POINTER FOR FIRST BYTE FOR L6
1627 2016A2  1016A2  4491 TSCODD   BU    TSCFETCH          FETCH 2 BYTES FROM DDDF BUFFER
1628 24C72B  13472B  4492          TBON  3,L7,TSCCHKLO     GO IF RIGHT BYTE NOT 'FF'
1629 0EC0FF  08C0FF  4493          ADDI  LO,255            SUBTRACT 1 FROM LO FOR CALCULATION
162A 001639  001639  4494          B     TSCADJL2          GO FIX DDDR DIFFERENCE AND DO CALC
162B 0C8081  02C081  4495 TSCCHKLO TEORI LO,X'81'          IF LO IS '81',
162C 205636  111636  4496          BNZ   TSCCHKL6            THE NEXT BYTE IS THE LAST BYTE
162D 2A0000  188000  4497          LBI   LO,0              FETCH LAST BYTE
162E 2440C6  1140C6  4498          LINC  L6,LO,1             "   "   "
162F 2EC601  1BC601  4499          ADDI  L6,1              INCR TO TEST FOR ZERO
1630 04C61D  03461D  4500          TBON  3,L6,TSCEOF       GO IF LAST BYTE IS NOT 'FF'
1631 2A0201  188201  4501          LBI   L2,X'01'          DDDR ADJUSTMENT
1632 0E5480  09D480  4502          ORI   MSC2,SCANSW       TURN ON BIT FOR TRANSFER COUNT=258
1633 2E33FD  18F3FD  4503          ANDI  DXC,FF-SUBTRACT   TURN OFF LSR SUBTRACT BIT
1634 2A0802  188802  4504 TSC1BYT  LBI   L8,X'02'          SET CONTROL FOR 1 BYTE TRANSFER
1635 001641  001641  4505          B     TSCFDONE          GO TO ADJUST DDDR AND SET CCH & CCL
1636 04C627  034627  4506 TSCCHKL6 TBON  3,L6,TSCODD       CONTINUE SCAN IF LEFT BYTE NOT 'FF'
1637 0A0501  088501  4507          LBI   L5,X'01'          ADJUST CCL FOR THIS CASE
1638 0E5480  09D480  4508          ORI   MSC2,SCANSW       TURN ON TRANSFER COUNT=258 BIT
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1639 2A0201   188201  4509 TSCADJL2 LBI   L2,X'01'          ADJUST DDDR DIFFERENCE
163A 2A0480   188480  4510 TSCCALC  LBI   L4,X'80'          INITIALIZE L4 TO 128
163B 2E80FF   1ACOFF  4511          EORI  L0,X'FF'          PERFORM SUBTRACTION
163C 0FC400   0FC400  4512          ADD1  L4,L0               OF POINTER FROM 128
163D 2F0404   1CC404  4513          ADD   L4,L4             DOUBLE THE RESULT
163E 2F0204   1CC204  4514          ADD   L2,L4             ADD INCREMENT, L2 HAS DDDR ADJUSTMNT
163F 0F0504   0CC504  4515          ADD   L5,L4             ADD INCREMENT, L3 CONTAINS CCL VALUE
1640 0E7302   09F302  4516          ORI   DXC,SUBTRACT      TURN ON THE LSR SUBTRACT BIT
1641 0B3D02   0CBD02  4517 TSCFDONE MV    B00,L2            MOVE DDDR DECREMENT(OR INC) TO B00
1642 0E2340   08E340  4518          ANDI  DST,CHOUTVAL      TRANSFER DDDR LO TO CIO
1643 0A3D00   088D00  4519          LBI   B00,0             DDDR HI IS ZERO
1644 0011CD   0011CD  4520          BU    TIOUDDDR          GO TO SUBROUTINE TO UPDATE DDDR
1645 089A05   029A05  4521          SABI  BLOCKB,B(DDCFORGL)  SET BASE BLOCK BACK TO DDCF
1646 0A001C   08801C  4522          LBI   L0,D(SCANSTOR)    DISPLACEMENT FOR SCAN SAVE AREA
1647 044085   014085  4523          SINC  L5,L0,1           SAVE CCL
1648 040088   004088  4524          SINC  L8,L0,0           SAVE CONTROL BYTE
1649 0E4908   09C908  4525          ORI   GEN1,XFRDDDF      SET TRANSFER DDDF MARK      -<GHD>-
164A 07CD4C   0F4D4C  4526          TBOFF 7,RBYT,TSCORE     GO IF COMMAND IS SCAN READ OR EQUAL
164B 2E6F40   19EF40  4527 TSCORH   ORI   SCN,SCANHI        SET SCAN HIGH OR EQUAL MARK
164C 201BEE   101BEE  4528 TSCORE   BU    TWRSETHD          SET HEAD
164D 200780   100780  4529          BU    TEFSETRW          GO SET READ/WRITE TAG
164E 2E4922   19C922  4530          ORI   GEN1,UPDTRDUS+FIXDDCF  MARKS FOR END PROCEDURE  -<GHD>-
                     4531 *
164F 2E5103   19D103  4532          ORI   CEB1,PROCKEY+PROCDAT  SET PROCESS KEY AND DATA MARKS
1650 0E5360   09D360  4533          ORI   MSC1,MUTRK+MUREC    MULTIPLE TRACK,MULTIPLE RECORD MARKS
1651 201441   101441  4534          B     TRDSCSRH          ELSE GO TO SEARCH FOR A COUNT FIELD
                     4535 ****************************************
                     4536 *     THIS ROUTINE SCANS DATA FIELD
                     4537 ****************************************
                     4538 *
1652 2E11FD   18D1FD  4539 TSCKEY   ANDI  CEB1,FF-PROCKEY     TURN OFF PROCESS KEY MARK
1653 0E2F40   08EF40  4540          ANDI  SCN,X'40'           TURN OFF FILE DATA XFER CONTROLS
1654 2E12F8   18D2F8  4541          ANDI  CEB2,X'F8'          UPDATE TRACK ORIENT
1655 0E5202   09D202  4542          ORI   CEB2,ENDKEY           TO END OF KEY FIELD
1656 26DA58   1B5A58  4543          TBOFF 3,KCNT,TSCDATA      GO IF KCNT IS ZERO
1657 20154A   10154A  4544          B     TRDSPKEY            GO TO SPACE OVER KEY FIELD
                     4545 *
                     4546 *
1658 2E11FE   18D1FE  4547 TSCDATA  ANDI  CEB1,FF-PROCDAT     RESET PROCESS DATA MARK
1659 0E2F40   08EF40  4548          ANDI  SCN,X'40'           RESET FILE XFER CONTROLS
165A 2E5203   19D203  4549          ORI   CEB2,ENDDAT         UPDATE TRACK ORIENTATION
165B 27145D   1C545D  4550          TIBOF DLO,MSC2,*+2        GO IF DATA LENGTH NOT ZERO
165C 201562   101562  4551          B     TRDSPDLO            GO SPACE OVER ONE BYTE OF DATA FIELD
                     4552 *
165D 068540   028540  4553          SABI  INDEXF1,IDXDDDF     SET PGM POINTER TO DDDF
165E 288740   128740  4554          SABI  INDEXF2,IDXDDDF       "
165F 28D7CE   1397CE  4555          SZI   ZLSCH,ZLSWFILE      SET ZLS TO WRITE MODE
1660 2E09FE   18C9FE  4556          ANDI  GEN1,FF-ODDXFER     RESET FILE ODD SWITCH
1661 269464   1A5464  4557          TIBOF DDDRODD,MSC2,TSCEVEN  GO IF EVEN ADDR BOUNDARY
1662 2E6F04   19EF04  4558          ORI   SCN,FILEODD         TURN ON FILE ODD XFER
1663 0E4901   09C901  4559          ORI   GEN1,ODDXFER        TURN ON FILE ODD SWITCH
1664 08BE00   028E00  4560 TSCEVEN  SADI  DISPCH,D(DDDFORG)   INITIALIZE DISP FOR CHAN TRAP
1665 2E6F80   19EF80  4561          ORI   SCN,SCANRD          TURN ON SCAN READ CONTROL
1666 2B071B   1C871B  4562          MV    L7,DCNT             COPY DATA LENGTH
1667 269F6A   1A5F6A  4563          TIBOF DEFDAT,FFLG,TSCNODEF  GO IF NO DEFECT IN DATA FLD -<CD>-
1668 06DD6B   085D6B  4564          TBOFF 3,SDH,TSCCKSPL      GO IF DEFECT IN NEXT FIELD    -<CD>-
1669 0EDDFF   0BDDFF  4565          ADDI  SDH,-1              DECREMENT SD HIGH             -<CD>-
166A 201531   101531  4566 TSCNODEF B     TRDNODEF            GO TO READ COMMON RTN         -<CD>-
166B 24DE6E   135E6E  4567 TSCCKSPL TBUN  3,SDL,TSCSPD       GO IF DATA FIELD IS SPLIT
166C 0001E8   0001E8  4568          BU    TDSRDG4             GO EXTEND GAP BY 128 BYTES
166D 201531   101531  4569          B     TRDNODEF            GO TO READ COMMON RTN
                     4570 *
166E 2E6F20   19EF20  4571 TSCSPD   ORI   SCN,SCNSPLIT        TURN ON SCAN SPLIT FIELD CONTROL
166F 20152C   10152C  4572          B     TRDSPLIT            GO TO READ SPLIT FIELD COMMON RTN
                     4573 *
                     4574 ************************************************************
                     4575 *
                     4576 *  RESTORE CCHHKLDLDL OF DDCF READ FROM DISK WITH CURRENT VALUES
                     4577 *  FROM DLS TO PROVIDE VALID DDCF WHEN A UNIT CHECK IS PRESENT
                     4578 *
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                     4579 ************************************************************
1670 0A0182   088182  4580 TSCRDDCF LBI   L1,D(DDCFORGR+2)    SET DISPLACEMENT TO CC HI OF DDCF
1671 2A0003   188003  4581          LBI   L0,D(DDCFORGL+3)    SET DISPLACEMENT TO CC LOW OF DDCF
1672 044196   014196  4582          SINC  CHI,L1,1            STORE CC HIGH
1673 048190   024190  4583          SINC  ZER,L1,2            ZERO HEAD HI
1674 044097   014097  4584          SINC  CLO,L0,1            STORE CC LOW
1675 044098   014098  4585          SINC  HEAD,L0,1           STORE HEAD LOW
1676 24409A   11409A  4586          SINC  KCNT,L0,1           STORE KL
1677 24009B   10409B  4587          SINC  DCNT,L0,0           STORE DL LOW
1678 27D47C   1F547C  4588          TIBOF DL256,MSC2,*+4      GO IF DL NOT = 256
1679 0A0501   088501  4589          LBI   L5,X'01'            LOAD L5 WITH DL HIGH = '01'
167A 040185   004185  4590          SINC  L5,L1,0             STORE DL HIGH
167B 0F90D0   0ED0D0  4591          EORU  ZER,ZER             RETURN TO COMPLETE RESTORE OF DDCF
167C 240190   104190  4592          SINC  ZER,L1,0            ZERO DL HIGH
167D 0F90D0   0ED0D0  4593          EORU  ZER,ZER             RETURN TO COMPLETE RESTORE OF DDCF
                     4594          MBLOK
167E 00167E   00167E  4595+         B     *                   UNUSED  ::::::::::::
167F 20167F   10167F  4596+         B     *                   UNUSED  ::::::::::::
1700                  4597+         DS    <0>B
                     4598          END COPY-MEMBER TSC12
                     4599      COPY      TSK
                     4600 ************************************************
                     4601 *  SEEK AND RECALIBRATE
                     4602 ************************************************
                     4603 *
                     4604 *          RECALIBRATE
                     4605 *
1700 0E0BF7   08CBF7 4606 TSKRECAL ANDI  STAT,FF-NOOP        RESET NOP STATUS
1701 0A2E02   08AE02 4607          LBI   FB0,X'02'           'REZERO' TO FB0
1702 2A0500   188500 4608          LBI   L5,0                ZERO ACTIVE PAC
1703 2A0600   188600 4609          LBI   L6,0                ZERO ACTIVE PAH
1704 0A0818   088818 4610 TSKHIDSK LBI   L8,D(TSKPA)         GET ACTIVE PA POINTER
1705 244885   114885 4611          SINC  L5,L8,1             SAVE ACTIVE
1706 040886   004886 4612          SINC  L6,L8,0               PAC AND PAH
1707 2CAE02   12EE02 4613          TEORI FB0,X'02'           TEST FOR RECALIBRATE CMD
1708 20570E   11170E 4614          BNZ   TSKHIDX             GO IF NOT
1709 001732   001732 4615          B     TSKOOSK             GO XMIT REZERO
                     4616 *
                     4617 *            SEEK
                     4618 *
170A 0E0BF7   08CBF7 4619 TSKSEEK  ANDI  STAT,FF-NOOP        RESET NOP STATUS
1708 0A0818   088818 4620          LBI   L8,D(TSKPA)
170C 0448C5   0148C5 4621          LINC  L5,L8,1             FETCH ACTIVE PAC
170D 2408C6   1048C6 4622          LINC  L6,L8,0             FETCH ACTIVE PAH
170E 0A0400   088400 4623 TSKHIDX  LBI   L4,0
170F 0A0700   088700 4624          LBI   L7,0
1710 064612   094612 4625          TBOFF 1,L6,*+2            ACTIVE PAC >255?
1711 0EC401   0BC401 4626          ADDI  L4,1
1712 064F14   094F14 4627          TBOFF 1,PAH,*+2           CURRENT PAC >255?
1713 0EC701   08C701 4628          ADDI  L7,1                ACTIVE PAC=L4,L5; CURRENT=L7,PAC
1714 2E85FF   1AC5FF 4629          EORI  L5,255
1715 0E84FF   0AC4FF 4630          EORI  L4,255
1716 0F050E   0CC50E 4631          ADD   L5,PAC
1717 0F4407   0DC407 4632          ADDC  L4,L7
1718 00971D   02171D 4633          BCY   TSKMOUT             IF CARRY, MOTION OUT
1719 0E84FF   0AC4FF 4634          EORI  L4,255
171A 2E85FF   1AC5FF 4635          EORI  L5,255
171B 0E4680   09C680 4636          ORI   L6,128              SET MOTION IN
171C 001720   001720 4637          B     TSKMIN
171D 2EC501   18C501 4638 TSKMOUT  ADDI  L5,1
171E 0F4410   0DC410 4639          ADDC  L4,ZER
171F 2E061F   18C61F 4640          ANDI  L6,X'1F'            SET MOTION OUT
1720 0E069F   08C69F 4641 TSKMIN   ANDI  L6,X'9F'
1721 07C423   0F4423 4642          TBOFF 7,L4,*+2
1722 0E4640   09C640 4643          ORI   L6,X'40'            SET DIFF 256
1723 0B2E06   0CAE06 4644          MV    FB0,L6              HAR TO FB0
1724 0A26EB   08A6EB 4645          LBI   FTO,X'EB'           'SET HAR' TO FTO'
1725 001584   001584 4646          BU    TRDNOFBI            XMIT HAR
1726 0B2E05   0CAE05 4647          MV    FB0,L5              DIFF TO FB0
1727 2A268C   18A68C 4648          LBI   FTO,X'8C'           'SET DIFF' TO FTO
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1728 001584   001584  4649          BU    TRDNOFBI          XMIT DIFF
1729 2A268F   18A68F  4650          LBI   FTO,X'8F'
172A 2A2E09   18AE09  4651          LBI   FBO,X'09'         'SENSE DIFF' TO FBO
172B 201583   101583  4652          BU    TRDSBTIM
172C 0DA245   06E245  4653          TEOR  FBI,L5            COMPARE SENSED DIFF
172D 025731   091731  4654          BZ    TSKDIFOK
172E 0A0818   088818  4655          LBI   L8,X'18'
172F 0B2E05   0CAE05  4656          MV    FBO,L5
1730 200708   100708  4657          B     TEFL703
1731 0A2E08   08AE08  4658 TSKDIFOK LBI   FBO,X'08'         SEEK START
1732 2A268F   18A68F  4659 TSK00SK  LBI   FTO,X'8F'         XMIT CONTROL
1733 001584   001584  4660          BU    TRDNOFBI
1734 0A041E   08841E  4661          LBI   L4,D(UCWPTR)
1735 0404C8   0044C8  4662          LINC  L8,L4,0
1736 0EC81A   0BC81A  4663          ADDI  L8,26
1737 04488E   01488E  4664          SINC  PAC,L8,1          CURRENT TO OLD PAC
1738 05488F   05488F  4665          SINC  PAH,L8,5          CURRENT TO OLD PAH
1739 0A0718   088718  4666          LBI   L7,D(TSKPA)
173A 2447CE   1147CE  4667          LINC  PAC,L7,1          ACTIVE PAC TO DLS
173B 2407CF   1047CF  4668          LINC  PAH,L7,0          ACTIVE PAH TO DLS
173C 0A2684   08A684  4669          LBI   FTO,X'84'         'READ STATUS' TO FTO
173D 001584   001584  4670          BU    TRDNOFBI
173E 05E261   076261  4671          TBON  7,FBI,TSKEND1     EXIT IF SEEK COMPLETE
173F 05A244   066244  4672          TBON  6,FBI,TSKINTSK    GO UPDATE USAGE IF BUSY
1740 0C0C07   00CC07  4673          TANDI QBYT,X'07'        EXIT IF
1741 005744   011744  4674          BNZ   TSKINTSK             HIDDEN SEEK
1742 0A0409   088409  4675          LBI   L4,X'09'          POST SEEK BUSY MISSING ERROR MSG
1743 200707   100707  4676          B     TEFNRERR
1744 2448C4   1148C4  4677 TSKINTSK LINC  L4,L8,1           FETCH SEEK
1745 27C8C5   1F48C5  4678          LDEC  L5,L8,1              USAGE COUNTER
1746 2EC501   1BC501  4679          ADDI  L5,1              INCREMENT SEEK
1747 0F4410   0DC410  4680          ADDC  L4,ZER               USAGE COUNTER
1748 060448   084448  4681          TBOFF 0,L4,*+3          CHECK FOR OVERFLOW
1749 0011F4   0011F4  4682          BU    TIPBSGEN          FORM BSDA
174A 0F4A42   0DCA42  4683          OR    UNCK,L2           SET OVERFLOW MARK
174B 044884   014884  4684          SINC  L4,L8,1           RESTORE UPDATED
174C 040885   004885  4685          SINC  L5,L8,0              SEEK USAGE COUNTER
174D 0C0C07   00CC07  4686          TANDI QBYT,X'07'        EXIT IF NOT
174E 025761   091761  4687          BZ    TSKEND1              HIDDEN SEEK
174F 0A01F5   0881F5  4688          LBI   L1,245            INIT TIMER
1750 0A2684   08A684  4689          LBI   FTO,X'84'         READ STATUS TO FTO
1751 001584   001584  4690 TSKHSLP  BU    TRDNOFBI          TAG FLIPPER
1752 03E258   076258  4691          TBON  7,FBI,TSKTOK      GO IF SEEK COMPLETE
1753 2EC001   1BC001  4692          ADDI  L0,1              INCREMENT
1754 0F4110   0DC110  4693          ADDC  L1,ZER               TIMER
1755 029751   0A1751  4694          BNC   TSKHSLP           GO IF NO OVERFLOW
1756 2A081C   18881C  4695          LBI   L8,X'1C'          POST SEEK CHECK
1757 200708   100708  4696          B     TEFL703           ERROR, TIMEOUT >20 MS
1758 06625C   09625C  4697 TSKTOK   TBOFF 1,FBI,*+4         GO IF NO INTERFACE CHECK
1759 0011F4   0011F4  4698          BU    TIPBSGEN          GO FORM BSDA
175A 2B0103   1C8103  4699          MV    L1,L3             MOVE BSDA BITS 0-3
175B 00127A   00127A  4700          B     TIPNOSTK          GO SET UP ERROR
175C 24A259   126259  4701          TBON  2,FBI,*-3         GO IF DRIVE CHECK
175D 2A268F   18A68F  4702          LBI   FTO,CONTROL       XMIT RESET DM
175E 0A2E04   08AE04  4703          LBI   FBO,RSTATTN          ATTENTION TAG
175F 2013B5   1013B5  4704          BU    TIPNOCHK          TAG FLIPPER
1760 000400   000400  4705          B     TDXSKCPL          RETURN, HIDDEN SEEK COMPLETE
1761 0E0BFE   08CBFE  4706 TSKEND1  ANDI  STAT,FF-SKCMPL     RESET SK COMPLETE STATUS
1762 0011F4   0011F4  4707          BU    TIPBSGEN          GENERATE BSDA
1763 2A081F   18881F  4708          LBI   L8,D(SKMARK1)     GET SEEK IN
1764 0408C4   0048C4  4709          LINC  L4,L8,0                    PROGRESS  MARKS
1765 0F4443   0DC443  4710          OR    L4,L3             POST SIP MARK
1766 240884   104884  4711          SINC  L4,L8,0           RESTORE MARK
1767 20011F   10011F  4712          B     TCUSTART          GO IF CLEAN UP ROUTINE
                      4713 *
                      4714 ********************************************************************
                      4715 *    READ AND RESET BUFFERED LOG ROUTINE
                      4716 ********************************************************************
                      4717 *
1768 0E0BF7   08CBF7  4718 TSKRRBLG ANDI  STAT,FF-NOOP       RESET NOP STATUS
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1769 0A0860   088860  4719          LBI   L8,X'60'          POST ENVIROMENT
176A 0A071B   08871B  4720          LBI   L7,X'1B'             DATA MESSAGE
176B 00190A   00190A  4721          B     TSNSENSE          GO TO ERROR ANALYSIS TO SET UP SENSE
                      4722 *                                BYTES AND RESET DRIVE USAGE COUNTERS
                      4723 *
                      4724 ********************************************************************
                      4725 *    READ DIAGNOSTIC SENSE ROUTINE
                      4726 ********************************************************************
                      4727 *
176C 0A07E8   0887E8  4728 TSKRDSNS LBI   L7,-24           SET UP TO ZERO 24 BYTES
176D 0A041E   08841E  4729          LBI   L4,D(UCWPTR)    SET CS DISPL
176E 2404C6   1044C6  4730          LINC  L6,L4,0         FETCH DISP OF SENSE AREA
176F 2B0406   1C8406  4731          MV    L4,L6           MOVE UCW PTR TO L4 ALSO
1770 27087E   1C487E  4732          TIBOF NOOP,STAT,TSKNOZER GO IF THERE IS UNIT CHECK
1771 200180   100180  4733          BU    TRSNSLP         GO ZERO 24 BYTES SENSE
1772 271276   1C5276  4734          TIBOF WHAOK,CEB2,TSKGETDM GO IF NOT FOLLOWING RDHA
1773 2EC6FE   1BC6FE  4735          ADDI  L6,-2           POINT TO BYTE 23
1774 04469D   01469D  4736          SINC  SDH,L6,1        STORE SKIP DISPLACEMENT HIGH
1775 04469E   01469E  4737          SINC  SDL,L6,1        STORE SKIP DISPLACEMENT LOW
1776 2EC6EA   1BC6EA  4738 TSKGETDM ADDI  L6,-22          POINT TO BYTE 2
1777 2A268F   18A68F  4739          LBI   FTO,CONTROL     CONTROL TAG
1778 0A2E83   08AE83  4740          LBI   FBO,SENSTAT1    SENSE STATUS 1 MODIFIER
1779 201385   101385  4741          BU    TIPNOCHK        TAG SUBRTN
177A 0B0022   0C8022  4742          MV    L0,FBI          COPY BUS IN
177B 2E0007   18C007  4743          ANDI  L0,X'07'        SAVE DM SIZE BITS ONLY
177C 240680   104680  4744          SINC  L0,L6,0         STORE BYTE 2
177D 001974   001974  4745          B     TSNCHKWR        GO CHECK FOR WRITE INHIBITED
177E 201800   101800  4746 TSKNOZER B     TSKUCKON        GO CONTINUE IN NEXT BLOCK
                      4747          MBLOK
177F 00177F   00177F  4748+         B     *               UNUSED  ::::::::::::
1800                  4749+         DS    <0>B
                      4750 *
                      4751 *    READ DIAGNOSTIC SENSE ROUTINE CONTINUE
                      4752 *
1800 0E0BF7   08CBF7  4753 TSKUCKON ANDI  STAT,X'F7'        RESET NOP
1801 2A05E8   1885E8  4754          LBI   L5,-24            SET UP TO XFER 24 BYTES
1802 2A0000   188000  4755          LBI   L0,0              SET UP TO XFER 24 BYTES
1803 069406   0A5406  4756          TBOFF 2,MSC2,TSKOELP    *START ON EVEN BOUNDARY IF ON
1804 2EC080   1BC080  4757 TSKBIGLP ADDI  L0,X'80'         INCREMENT DDDF
1805 2F4010   1DC010  4758          ADDC  L0,ZER               DISPLACEMENT ADDR
1806 089A05   029A05  4759 TSKOELP  SABI  BLOCKB,B(UCWPTR)  SET BLOCK ADDR OF SENSE AREA
1807 0444C6   0144C6  4760          LINC  L6,L4,1           FETCH ONE BYTE
1808 089A06   029A06  4761          SABI  BLOCKB,B(DDDFORG) CHANGE BLOCK ADDR TO DDDF
1809 240086   104086  4762          SINC  L6,L0,0           STORE BYTE INTO DDDF
180A 2EC501   1BC501  4763          ADDI  L5,1              INCR COUNTER
180B 029804   0A1804  4764          BNC   TSKBIGLP          GO IF NOT DONE
180C 089A05   029A05  4765          SABI  BLOCKB,B(UCWPTR)  RESTORE BASE BLOCK ADDR
180D 0A0800   088800  4766          LBI   L8,0              SET UP TO
180E 2A2100   18A100  4767          LBI   CCH,0                XFER 24 BYTES
180F 2A3116   18B116  4768          LBI   CCL,22                  TO CHANNEL
1810 0A0400   088400  4769          LBI   L4,0              STORE TRANSFER COUNT
1811 2A0518   188518  4770          LBI   L5,24               FOR CHAN CNTR CHK
1812 000BDE   000BDE  4771          BU    TENSDDDF          DO CHANNEL XFER
1813 0011CB   0011CB  4772          BU    TIORDDDR          FETCH DDDR
1814 201EB7   101EB7  4773          BU    TWRCHKDR          CHECK CHANNEL CNTR
1815 2010FB   1010FB  4774          BU    TIODDDR1          INCREMENT DDDR BY 1 FOR FINAL VALUE
1816 20011F   10011F  4775          B     TCUSTART          GO TO CLEAN UP
                      4776 ********************************************************************
                      4777 *    THIS ROUTINE CONVERTS SYSTEM 3 SEEK ARGUMENTS INTO 3340 PHYSICAL
                      4778 *    AND LOGICAL SEEK ARGUMENTS.  THIS ROUTINE MUST BE CALLED AS A
                      4779 *    SUBROUTINE.  THE FOLLOWING ALGORITHM IS USED FOR CONVERSION:
                      4780 *       20(CC) + (HH) = 6(CHI,CLO) + Q(HEAD/2)
                      4781 *       C/6 = Q1 + R1
                      4782 *       (20R1 + HH)/12 = Q2 +R2
                      4783 *       2R2 = PAH EVEN
                      4784 *       10Q1 + Q2 = PAC
                      4785 *       2R2/12 = Q3 + R3
                      4786 *       20Q1 + 2Q2 + Q3 = CHI,CLO
                      4787 *       R3 = HEAD EVEN
                      4788 *
```

```
 LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       4789 ************************************************************************
                       4790 *
1817 2441C2   1141C2   4791 TSK3WIN  LINC  L2,L1,1            LOAD L2 WITH C(HI)
1818 27C1C3   1F41C3   4792          LDEC  L3,L1,1            LOAD L3 WITH H(HI)
1819 24C21B   13421B   4793          TBON  3,L2,*+2           GO IF L2=0
181A 26C31D   18431D   4794          TBOFF 3,L3,*+3           GO IF L3=0
181B 2A0804   188804   4795 TSKINVSK LBI   L8,X'04'           SET INVALID SEEK ARGUMENT
181C 001104   001104   4796          B     TIOL700            ERROR BRANCH
181D 0440C2   0140C2   4797          LINC  L2,L0,1            LOAD L2 WITH C(LO)
181E 07C0C3   0F40C3   4798          LDEC  L3,L0,1            LOAD L3 WITH H(LO)
181F 2CC22F   13C22F   4799          TADDI L2,47              CHECK FOR 209
1820 275422   1D5422   4800          TIBOF SIZE12,MSC2,*+2    GO IF NOT 12MB DATA MODULE
1821 0CC2DE   03C2DE   4801          TADDI L2,222             CHECK FOR 34
1822 229828   1A182B   4802          BNC   TSKCOK             C<209 /// C<34
1823 00581B   01181B   4803          BNZ   TSKINVSK           C>209, ERROR  /// C>34--ERROR
1824 0A0821   088821   4804          LBI   L8,D(SVPOPT)        GET SVP
1825 0408C8   0048C8   4805          LINC  L8,L8,0               OPTION BYTE
1826 04482B   01482B   4806          TIBON ALOWSKCE,L8,TSKCOK  GO IF CE TRACKS ALLOWED
1827 0CC3F8   03C3F8   4807          TADDI L3,248             C=209 , CHECK FOR HEAD > 7
1828 07542A   0D542A   4808          TIBOF SIZE12,MSC2,*+2    GO IF NOT 12MB DATA MODULE
1829 2CC3EE   13C3EE   4809          TADDI L3,238             C=34 , CHECK FOR HEAD > 17
182A 00981B   02181B   4810          BCY   TSKINVSK           HD >7--ERROR  // HD >17--ERROR
182B 0CC3EC   03C3EC   4811 TSKCOK   TADDI L3,236
182C 00981B   02181B   4812          BCY   TSKINVSK           H>19, ERROR
182D 2A1700   189700   4813          LBI   CLO,0              START ADDRESS CONVERSION
182E 0ED72D   0BD72D   4814 TSK54LP  ADDI  CLO,45             CLO + 45
182F 2EC2CA   18C2CA   4815          ADDI  L2,202             L2 - 54
1830 00982E   02182E   4816          BCY   TSK54LP
1831 2ED7FB   1BD7FB   4817 TSK6LP   ADDI  CLO,-5             CLO - 5
1832 2EC206   18C206   4818          ADDI  L2,6               L2 + 6
1833 029831   0A1831   4819          BNC   TSK6LP
1834 2F0202   1CC202   4820          ADD   L2,L2              L2=2R
1835 2F0202   1CC202   4821          ADD   L2,L2              L2=4R
1836 281802   1C9802   4822          MV    HEAD,L2            HEAD=4R
1837 2F0202   1CC202   4823          ADD   L2,L2              L2=8R
1838 2F0202   1CC202   4824          ADD   L2,L2              L2=16R
1839 0F0218   0CC218   4825          ADD   L2,HEAD            L2=20R
183A 0F0302   0CC302   4826          ADD   L3,L2              L3=20R + H(LO)
183B 2A18FF   189FFF   4827          LBI   HEAD,FF
183C 2ED801   18D801   4828 TSK12LP  ADDI  HEAD,1             HEAD + 1
183D 2EC3F4   18C3F4   4829          ADDI  L3,244             L3 - 12
183E 09983C   02183C   4830          BCY   TSK12LP
183F 0EC30C   0BC30C   4831          ADDI  L3,12
1840 2F0303   1CC303   4832          ADD   L3,L3              L3 = PAH EVEN
1841 0A1600   089600   4833          LBI   CHI,0
1842 2F1717   1CD717   4834          ADD   CLO,CLO
1843 0F5610   0DD610   4835          ADDC  CHI,ZER
1844 2F1718   1CD716   4836          ADD   CLO,HEAD
1845 0F5610   0DD610   4837          ADDC  CHI,ZER            CHI,CLO = PAC
1846 081803   0C9803   4838          MV    HEAD,L3
1847 07D649   0F5649   4839          TBOFF 7,CHI,*+2
1848 0E4340   09C340   4840          ORI   L3,X'40'           SET L3B1 IF PAC >255
1849 0A0818   088818   4841          LBI   L8,D(TSKPA)
184A 244897   114897   4842          SINC  CLO,L8,1           PAC TO CS
184B 040883   004883   4843          SINC  L3,L8,0            PAH TO CS
184C 2F1717   1CD717   4844          ADD   CLO,CLO
184D 0F5616   0DD616   4845          ADDC  CHI,CHI
184E 2ED8F4   18D8F4   4846          ADDI  HEAD,244           PAH - 12
184F 209852   121852   4847          BCY   *+3
1850 0ED80C   0BD80C   4848          ADDI  HEAD,12            HEAD EVEN
1851 001854   001854   4849          B     *+3                *
1852 2ED701   18D701   4850          ADDI  CLO,1              *
1853 0F5610   0DD610   4851          ADDC  CHI,ZER            *
1854 07CF56   0F4F56   4852          TBOFF 7,PAH,*+2          *
1855 2ED801   18D801   4853          ADDI  HEAD,1             *
1856 240196   104196   4854          SINC  CHI,L1,0           *
1857 044097   014097   4855          SINC  CLO,L0,1           *
1858 27C098   1F4098   4856          SDEC  HEAD,L0,1          *
1859 07545B   0D545B   4857          TIBOF SIZE12,MSC2,*+2    GO IF NOT 12MB DATA MODULE
185A 00014B   00014B   4858          B     TCUCNV12           GO CONVERT PA FOR 12 MB DATA MODULE
```



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 LOC.  OBJECT CODE      STM       SOURCE STATEMENT

 185B 0F90D0   CED0D0   4859          EORU  ZER,ZER            *
                       4860 *
                       4861 ************************************************************************
                       4862 *    THIS ROUTINE CONVERTS 3340 SEEK ARGUMENTS (LOGICAL ADDRESSES) TO
                       4863 *    SYSTEM 3 SEEK ARGUMENTS.  THIS ROUTINE MUST BE CALLED AS A SUB-
                       4864 *    ROUTINE. THE FOLLOWING ALGORITHM IS USED FOR ADDRESS CONVERSION:
                       4865 *       6(CHI,CLO) + Q(HEAD/2) = 20(CC) + (HH)
                       4866 *          CHI B6 ON SETS K1=153, K2=12
                       4867 *          CHI B7 ON SETS K1= 76, K2=16
                       4868 *          CLO/10 = Q1 + R1
                       4869 *          HEAD/2 = Q2 + R2
                       4870 *          (K2 + 6R1 + Q2)/20 = Q3 + R3
                       4871 *          CC = K1 + 3Q1 + Q3
                       4872 *          HH = R3
                       4873 *
                       4874 *   BEFORE CALLING THIS ROUTINE SET UP THESE D POINTERS:
                       4875 *       L0 POINTS TO CS LOCATION OF CLO
                       4876 *       L1 POINTS RO CS LOCATION OF CHI
                       4877 *
                       4878 ************************************************************************
                       4879 *
 185C 0401C4   0041C4   4880 TSKWIN3  LINC  L4,L1,0            CHI IN CS TO L4
 185D 2440C5   1140C5   4881          LINC  L5,L0,1            CLO IN CS TO L5
 185E 07C0C3   0F40C3   4882          LDEC  L3,L0,1            HEAD IN CS TO L3
 185F 2A0600   188600   4883          LBI   L6,0               INIT HEAD LOW
 1860 0A0200   088200   4884          LBI   L2,0               INIT CYLINDER LOW
 1861 278464   1E4464   4885          TBOFF 6,L4,*+3
 1862 0A0299   088299   4886          LBI   L2,153
 1863 2A060C   18860C   4887          LBI   L6,12
 1864 07C467   0F4467   4888          TBOFF 7,L4,*+3
 1865 2A024C   18824C   4889          LBI   L2,76
 1866 0A0610   088610   4890          LBI   L6,16
 1867 2EC209   18C209   4891 TSK30LP  ADDI  L2,9               L2 + 9
 1868 0EC5E2   0BC5E2   4892          ADDI  L5,226             L5 - 30
 1869 209867   121867   4893          BCY   TSK30LP
 186A 0EC2FD   0BC2FD   4894 TSK10LP  ADDI  L2,-3              L2 - 3
 186B 0EC50A   0BC50A   4895          ADDI  L5,10              L5 + 10
 186C 22986A   1A186A   4896          BNC   TSK10LP
 186D 2F0505   1CC505   4897          ADD   L5,L5              L5=2R
 186E 2F0605   1CC605   4898          ADD   L6,L5              L6+2R
 186F 2F0505   1CC505   4899          ADD   L5,L5              L5=4R
 1870 2F0605   1CC605   4900          ADD   L6,L5              L6+4R
 1871 270373   1C4373   4901          TBOFF 4,L3,*+2           :
 1872 2EC604   1BC604   4902          ADDI  L6,4               :
 1873 074375   0D4375   4903          TBOFF 5,L3,*+2           :
 1874 2EC602   1BC602   4904          ADDI  L6,2               :
 1875 278377   1E4377   4905          TBOFF 6,L3,*+2           :
 1876 2EC601   1BC601   4906          ADDI  L6,1               :
 1877 2EC2FF   1BC2FF   4907          ADDI  L2,FF              :
 1878 0EC201   0BC201   4908 TSK20LP  ADDI  L2,1               L2+1
 1879 2EC6EC   1BC6EC   4909          ADDI  L6,236             L3-20
 187A 009878   021878   4910          BCY   TSK20LP            :
 187B 0EC614   0BC614   4911          ADDI  L6,20              :
 187C 240190   104190   4912          SINC  ZER,L1,0           C(HI) TO CS
 187D 244082   114082   4913          SINC  L2,L0,1            C(LO) TO CS
 187E 27C086   1F4086   4914          SDEC  L6,L0,1            H(LO) TO CS
 187F 0F50D0   0DD0D0   4915          ORU   ZER,ZER            BRANCH TO MAIN ROUTINE
                       4916          MBLOK
 1900                  4917+         DS    <0>B
                       4918          END COPY-MEMBER TSK
                       4919      COPY      TSN12
                       4920 ************************************************
                       4921 *  ERROR FORMAT BREAKOUT TABLE
                       4922 ************************************************
                       4923 *
 1900 001829   001829   4924 TSNTABLE B     TSNEXIT              FORMAT 0
 1901 001A28   001A28   4925          B     TSNFMT1              FORMAT 1
 1902 201818   101818   4926          B     TSNFMT2              FORMAT 2
 1903 001903   001903   4927          B     *                    FORMAT 3
 1904 201800   101800   4928          B     TSNFMT4              FORMAT 4
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1905 201A73  101A73  4929          B     TSNFMT5              FORMAT 5
1906 001B1F  001B1F  4930          B     TSNFMT6              FORMAT 6
1907 201907  101907  4931          B     *                    FORMAT 7
                     4932 ************************************************
                     4933 *  ERROR SENSE BYTES SET UP ENTRY
                     4934 ************************************************
                     4935 *
1908 258B00  164B00  4936 TSNNORM  TIBON UNITCHK,STAT,TSNTABLE  GO IF UNIT CHK ALREADY ON
1909 2E4B02  19CB02  4937          ORI   STAT,UNITCHK           OR IN UNIT CHECK STATUS
                     4938 *
190A 2E257E  18E57E  4939 TSNSENSE ANDI  FTG,X'7E'             DROP TAG GATE
190B 2F9050  1ED050  4940          EOR   ZER,ZER                ZERO ZER
190C 08C6CC  0386CC  4941          SZI   ZLSLOCB,X'CC'          MAKE W0-W15 TO ZONE 0
190D 0011D9  0011D9  4942          BU    TIPZEROW               ZERO W0-W7
190E 08C60C  03860C  4943          SZI   ZLSLOCB,X'0C'          ALLOW ACCESS TO W0-W15
190F 0E2FF7  08EFF7  4944          ANDI  SCN,FF-ALWFXFR         RESER FILE XFER CONTROLS
1910 0B1800  0C9800  4945          MV    W8,L0                  SAVE DISPLACEMENT HIGH
1911 0B1901  0C9901  4946          MV    W9,L1                  SAVE DISPLACEMENT LOW
1912 0B1A04  0C9A04  4947          MV    W10,L4                 SAVE PATTERN HIGH / SENSE BYTE 18
1913 0B1B05  0C9B05  4948          MV    W11,L5                 SAVE PATTERN LOW
1914 0A1C00  089C00  4949          LBI   W12,0                  ZERO W12 FOR SENSE BYTE 0
1915 0B1D2E  0C9D2E  4950          MV    W13,FBD                SAVE FILE BUS OUT
1916 0B1E22  0C9E22  4951          MV    W14,FBI                SAVE FILE BUS IN
1917 0B1F26  0C9F26  4952          MV    W15,FTO                SAVE FILE TAG OUT
1918 0E1F8F  08DF8F  4953          ANDI  W15,X'8F'              MASK OFF UNWANTED BITS
1919 2011DD  1011DD  4954          BU    TIPZERO3               ZERO L0-L3
191A 2B1708  1C9708  4955          MV    W7,L8                  SENSE BYTE 7
191B 0B4607  0D8607  4956          MVX   L6,L7                  PREPARE TO SET UP SENSE BYTES 0-2
191C 0E0707  08C707  4957          ANDI  L7,X'07'               SAVE BIT POSITION
191D 2A0801  188801  4958          LBI   L8,1                   TURN ON BIT 7
191E 0EC701  0BC701  4959 TSNGEN02 ADDI  L7,1                   INCRMENT BIT POSITION
191F 050722  044722  4960          TBON  4,L7,TSN02DON          GO IF TRANSLATION DONE
1920 2F0808  1CC808  4961          ADD   L8,L8                  SHIFT BIT TO LEFT
1921 00191E  00191E  4962          B     TSNGEN02               CONTINUE
1922 05C625  074625  4963 TSN02DON TBON  7,L6,TSNS12            GO IF NOT FOR BYTE 0
1923 0B1C08  0C9C08  4964          MV    W12,L8                 SET BYTE 0
1924 201929  101929  4965          B     TSNSPEC                GO CONTINUE
1925 040628  004628  4966 TSNS12   TBON  0,L6,TSNS2             GO IF FOR BYTE 2
1926 2B1108  1C9108  4967          MV    W1,L8                  SET BYTE 1
1927 201929  101929  4968          B     TSNSPEC                GO CONTINUE
1928 2B1208  1C9208  4969 TSNS2    MV    W2,L8                  SET BYTE 2
1929 07062B  0C462B  4970 TSNSPEC  TBOFF 4,L6,*+2               GO IF NOT WRITE INHIBIT
192A GE5102  09D102  4971          ORI   W1,X'02'               TURN ON WRITE INHIBIT
192B 27462D  1D462D  4972          TBOFF 5,L6,*+2               GO IF NOT OP INCOMPLETE
192C GE5101  09D101  4973          ORI   W1,X'01'               POST OP INCOMPLETE
192D 07862F  0E462F  4974          TBOFF 6,L6,*+2               GO IF NOT CORRECTABLE
192E 0E5240  09D240  4975          ORI   W2,X'40'               POST CORRECTABLE
192F 28C608  138608  4976          SZI   ZLSLOCB,X'08'          RESTORE ZLS
1930 0C1110  00D110  4977          TANDI CEB1,PADTOIDX          TEST PADDING BIT
1931 025933  091933  4978          BZ    TSNOPDWN               GO IF NOT ON
1932 0003E0  0003E0  4979          BU    TDXWADEX               GO PAD TO INDEX
1933 201580  101580  4980 TSNOPDWN BU    TRDOPDWN               GO DO OPERATE DOWN
1934 08C60C  03860C  4981          SZI   ZLSLOCB,X'0C'          CHANGE ZLS TO ALLOW W0-W15 ACCESS
1935 08020E  0C820E  4982          MV    L2,PAC                 PREPARE TO
1936 0B060F  0C860F  4983          MV    L6,PAH                    CONVERT CURRENT PA
1937 2019D9  1019D9  4984          BU    TSNCONV                CONVERT PA TO WINCHESTER CCHH FORMAT
1938 0B1502  0C9502  4985          MV    W5,L2                  MOVE CYLINDER LOW TO BYTE 5
1939 2B1606  1C9606  4986          MV    W6,L6                  MOVE CYLINDER HIGH & HEAD TO BYTE 6
193A 2A268F  18A68F  4987          LBI   FTO,CONTROL            SET CONTROL TAG
193B 0A2E83  08AE83  4988          LBI   FBO,SENSTAT1           GET DATA MODULE SIZE TAG MODIFIER
193C 2013B5  1013B5  4989          BU    TIPNOCHK               GO TO TAG SUBRTN
193D 0B0022  0C8022  4990          MV    L0,FBI                 READ FILE BUS IN
193E 2E0007  18C007  4991          ANDI  L0,X'07'               SAVE DM SIZE BITS
193F 2F5240  1DD240  4992          OR    W2,L0                  OR DM SIZE TO BYTE 2
1940 2A001E  18801E  4993          LBI   L0,D(UCWPTR)           GET DISPL FOR ACT DEV PNTR
1941 2400C8  1040C8  4994          LINC  L9,L0,0                GET ACTIVE DEVICE POINTER
1942 0EC804  0BC804  4995          ADDI  L8,4                   INCR PTR TO BYTE 4
1943 27C8D4  1F48D4  4996          LDEC  W4,L8,1                FETCH Q-BYTE
1944 27C8D3  1D48D3  4997          LDEC  W3,L8,3                FETCH R-BYTE
1945 289A85  129A85  4998          SABI  BLOCKB,X'85'           SET MULTIPLE FETCH/STORE MODE
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1946 0B101C  0C901C  4999          MV    W0,W12                 MOVE SENSE BYTE 0 IN PLACE
1947 240890  104890  5000          SINC  W0,L8,0                STORE SENSE BYTES 0-7
1948 0011D9  0011D9  5001          BU    TIPZEROW               ZERO L0-L7
1949 0EC808  0BC808  5002          ADDI  L8,8                   BUMP CS POINTER TO BYTE 8
194A 040880  004880  5003          SINC  L0,L8,0                ZERO SENSE BYTES 8-15
194B 0EC808  0BC808  5004          ADDI  L8,8                   BUMP CS POINTER TO BYTE 16
194C 260880  184880  5005          SDEC  L0,L8,8                ZERO BYTES 16-23 ; CS PTR TO BYTE 8
194D 089A05  029A05  5006          SABI  BLOCKB,X'05'           RESTORE TO SINGLE BYTE MODE
194E 27D056  1F5056  5007          TBOFF 7,W0,TSNNTSK           GO IF NOT SEEK CHECK
194F 2EC812  18C812  5008          ADDI  L8,18                  BUMP CS POINTER TO OLD PA
1950 2448C2  1148C2  5009          LINC  L2,L8,1                FETCH OLD PAC
1951 27C8C6  1F48C6  5010          LDEC  L6,L8,1                FETCH OLD PAH
1952 2EC8EE  18C8EE  5011          ADDI  L8,-18                 RESTORE CS POINTER TO BYTE 8
1953 2019D9  1019D9  5012          BU    TSNCONV                GO DO CCHH CONVERSION
1954 2B1D02  1C9D02  5013          MV    W13,L2                 SET CYL LOW TO BYTE 13
1955 0B1E06  0C9E06  5014          MV    W14,L6                 SET CYL HIGH & HEAD TO BYTE 14
1956 2B4017  1D8017  5015 TSNNTSK  MVX   L0,W7                  MOVE FORMAT TO L0
1957 2E0007  18C007  5016          ANDI  L0,X'07'               SAVE FORMAT NUMBER ONLY
1958 211900  141900  5017          BR    B(TSNTABLE),L0         GO TO FORMAT BREAKOUT
                     5018 ************************************************
                     5019 *  PHYSICAL ADDR TO WINCHESTER CCHH CONVERSION
                     5020 ************************************************
                     5021 *
1959 28C608  138608  5022 TSNCONV  SZI   ZLSLOCB,X'08'          CHANGE ZLS TO ACCESS MSC2
195A 055466  055466  5023          TIBON SIZE12,MSC2,TSNCNV12   GO IF 12 MB DATA MODULE
195B 08C60C  03860C  5024          SZI   ZLSLOCB,X'0C'          CHANGE ZLS BACK TO ACCESS W0-W15
195C 0B0506  0C8506  5025          MV    L5,L6                  COPY PAH
195D 0E063F  08C63F  5026          ANDI  L6,X'3F'               SAVE HEAD ADDR ONLY
195E 2EC6F4  18C6F4  5027          ADDI  L6,-12                 MINUS 12 FROM HEAD
195F 0F4202  0DC202  5028          ADDC  L2,L2                  2 X CYL LOW AND ADD CARRY
1960 229962  1A1962  5029          BNC   *+2                    GO IF NO CARRY
1961 0E4520  09C520  5030          ORI   L5,X'20'               TURN ON CYL 256 BIT
1962 2E05E0  18C5E0  5031          ANDI  L5,X'E0'               SAVE ONLY CYL HIGH BITS
1963 260665  184665  5032          TBOFF 0,L6,*+2               GO IF HEAD ADDR NOT NEGATIVE
1964 0EC60C  0BC60C  5033          ADDI  L6,12                  ADJUST HEAD
1965 0F46C5  0DC6C5  5034          ORU   L6,L5                  COMBINE CYL HIGH WITH HEAD
                     5035 *
1966 2B0502  1C8502  5036 TSNCNV12 MV    L5,L2                  COPY PAC TO L5
1967 08C60C  03860C  5037          SZI   ZLSLOCB,X'0C'          CHANGE ZLS BACK TO ACCESS W0-W15
1968 0A02FF  0882FF  5038          LBI   L2,FF                  INIT LOG CYL LOW WITH -1
1969 G6466C  09466C  5039          TBOFF 1,L6,*+3               GO IF PA CYL 256 OFF
196A 2A0254  188254  5040          LBI   L2,84                  LOAD LOG CYL LOW WITH Q(256/3)-1
196B 2EC501  18C501  5041          ADDI  L5,1                   ADD R(256/3) TO PAC
196C 0EC201  0BC201  5042          ADDI  L2,1                   ADD TO L2 WITH
196D 2EC5FD  18C5FD  5043          ADDI  L5,-3                      THE QUOTIENT OF
196E 20996C  12196C  5044          BCY   *-2                           L5 DIVIDED BY 3
196F 0EC503  0BC503  5045          ADDI  L5,3                   ADJUST REMAINDER IN L5 TO POSITIVE
1970 2F0505  1CC505  5046          ADD   L5,L5                  THE LOG HEAD IS
1971 2F0505  1CC505  5047          ADD   L5,L5                     EQUAL TO 4 TIMES
1972 0E060F  08C60F  5048          ANDI  L6,X'0F'                     THE REMAINDER OF (PHY CYL/3)
1973 0F0685  0CC685  5049          ADDU  L6,L5                           PLUS THE PHY HEAD VALUE
1974 252278  146278  5050 TSNCHKWR TBON  4,FBI,*+4               GO IF WR ENABLE ON(WR INHIBIT OFF)
1975 0EC6FF  0BC6FF  5051          ADDI  L6,-1                  POINT TO BYTE 1
1976 0A0002  088002  5052          LBI   L0,X'02'               POST WR INHIBIT BIT ON
1977 240680  104680  5053          SINC  L0,L6,0                STORE BYTE 1 BACK
1978 201800  101800  5054          B     TSKUCKON               GO CONTINUE RD DIAG SENSE CMD
                     5055          MBLOK
1979 201979  101979  5056+         B     *                      UNUSED ::::::::::::
197A 20197A  10197A  5057+         B     *                      UNUSED ::::::::::::
197B 00197B  00197B  5058+         B     *                      UNUSED ::::::::::::
197C 20197C  10197C  5059+         B     *                      UNUSED ::::::::::::
197D 00197D  00197D  5060+         B     *                      UNUSED ::::::::::::
197E 00197E  00197E  5061+         B     *                      UNUSED ::::::::::::
197F 20197F  10197F  5062+         B     *                      UNUSED ::::::::::::
1A00                 5063+         DS    <0>B
                     5064 ************************************************************************
                     5065 *   E R R O R    S Y M P T O M    C O D E   SUBROUTINE FOR FORMAT 1
                     5066 ************************************************************************
                     5067 *
                     5068 *   W0 = BYTE 16;   W4 = BYTE 20;   W8 = BYTE  8;   W12 = BYTE 12;
```

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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       5069 *   W1 = BYTE 17;   W5 = BYTE 21;   W9 = BYTE  9;   W13 = BYTE 13;
                       5070 *   W2 = BYTE 18;   W6 = BYTE 22;  W10 = BYTE 10;   W14 = BYTE 14;
                       5071 *   W3 = BYTE 19;   W7 = BYTE 23;  W11 = BYTE 11;   W15 = BYTE 15;
                       5072 *
                       5073 ******************************************************
                       5074 *
1A00 041809   005809    5075 TSNSYMCD TBON   0,W8,TSNCTLCK       GO IF CONTROLLER CHECK
1A01 24D210   135210    5076          TBON   3,W2,TSNUPGM        GO IF UPGM DETECTED ERROR
1A02 245812   115812    5077          TBON   1,W8,TSNDIFCK       GO IF DRIVE INTERFACE CHECK
1A03 055A15   055A15    5078          TBON   5,W10,TSNDMSZE      GO IF DM SEQ OR SIZE CHECK
1A04 04981A   02581A    5079          TBON   2,W8,TSNDRVCK       GO IF DRIVE CHECK
1A05 0C1810   00D810    5080          TANDI  W8,X'10'            TEST FOR RD/WR CHECK
1A06 005A26   011A26    5081          BNZ    TSNRWCHK            GO IF RD/WR CHECK
1A07 2A1619   189619    5082          LBI    W6,X'19'            BYTE 22=X'19'; BYTE 23=BYTE 7
1A08 0F57D7   0DD7D7    5083 TSNRETUN ORU    W7,W7               RETURN
                       5084 *
1A09 2A1691   189691    5085 TSNCTLCK LBI    W6,X'91'            BYTE 22=X'91'
1A0A 0B1714   0C9714    5086          MV     W7,W4               BYTE 23=BYTE 20
1A0B 0E17FC   08D7FC    5087          ANDI   W7,X'FC'            SAVE BITS 0-5
1A0C 005A08   011A08    5088          BNZ    TSNRETUN            GO IF BYTE 20 BITS 0-4 NON ZERO
1A0D 2A1692   189692    5089          LBI    W6,X'92'            BYTE 22=X'92'
1A0E 2E11FE   18D1FE    5090          ANDI   W1,X'FE'            BYTE 23
1A0F 2B1791   1C9791    5091          MVU    W7,W1                    = BYTE 17 BITS 0-6
                       5092 *
1A10 0A1690   089690    5093 TSNUPGM  LBI    W6,X'90'            BYTE 22=X'90'
1A11 2B1792   1C9792    5094          MVU    W7,W2               BYTE 23=BYTE 18
                       5095 *
1A12 2A1610   189610    5096 TSNDIFCK LBI    W6,X'10'            BYTE 22=X'10'
1A13 0E1403   08D403    5097          ANDI   W4,X'03'            BYTE 23
1A14 2B1794   1C9794    5098          MVU    W7,W4                    = BYTE 20 BITS 6-7
                       5099 *
1A15 0A1611   089611    5100 TSNDMSZE LBI    W6,X'11'            BYTE 22=X'11'
1A16 2A17FF   1897FF    5101          LBI    W7,X'FF'            BYTE 23=X'FF'
1A17 041A08   005A08    5102          TBON   0,W10,TSNRETUN      GO IF DM SIZE CHECK
1A18 0E1A70   08DA70    5103          ANDI   W10,X'70'           DM SEQ CHECK --
1A19 0B179A   0C979A    5104          MVU    W7,W10                   BYTE 23 = BYTE 10 BITS 1-3
                       5105 *
1A1A 2B1710   1C9710    5106 TSNDRVCK MV     W7,W0               BYTE 23
1A1B 0E170F   08D70F    5107          ANDI   W7,X'0F'                 = BYTE 16 BITS 4-7
1A1C 0A1612   089612    5108          LBI    W6,X'12'            BYTE 22=X'12'
1A1D 041008   005008    5109          TBON   0,W0,TSNRETUN       GO IF ACCESS TIMEOUT
1A1E 241615   189615    5110          LBI    W6,X'15'            BYTE 22=X'15'
1A1F 245008   115008    5111          TBON   1,W0,TSNRETUN       GO IF OVERSHOOT CHECK
1A20 2A1616   189616    5112          LBI    W6,X'16'            BYTE 22=X'16'
1A21 249008   125008    5113          TBON   2,W0,TSNRETUN       GO IF SERVO OFF TRACK CHECK
1A22 2A1613   189613    5114          LBI    W6,X'13'            BYTE 22=X'13'
1A23 0A1701   089701    5115          LBI    W7,X'01'            BYTE 23=X'01'
1A24 041008   005008    5116          TBON   0,W0,TSNRETUN       GO IF SECTOR COMPARE CHECK
1A25 0B5797   0D9797    5117          MVXU   W7,W7               FALSE DRIVE CHECK -- BYTE 23=X'10'
                       5118 *
1A26 0A1614   089614    5119 TSNRWCHK LBI    W6,X'14'            BYTE 22=X'14'
1A27 0B179C   0C979C    5120          MVU    W7,W12              BYTE 23=BYTE 12
                       5121 ******************************************************
                       5122 *       F O R M A T   1     (REGISTER USAGE BELOW)
                       5123 ******************************************************
                       5124 *
                       5125 *   W0 = BYTE 16;   W4 = BYTE 20;   W8 = BYTE  8;   W12 = BYTE 12;
                       5126 *   W1 = BYTE 17;   W5 = BYTE 21;   W9 = BYTE  9;   W13 = BYTE 13;
                       5127 *   W2 = BYTE 18;   W6 = BYTE 22;  W10 = BYTE 10;   W14 = BYTE 14;
                       5128 *   W3 = BYTE 19;   W7 = BYTE 23;  W11 = BYTE 11;   W15 = BYTE 15;
                       5129 *
                       5130 ******************************************************
                       5131 *
1A28 0B041A   0C841A    5132 TSNFMT1  MV     L4,W10              SAVE SENSE BYTE 18
1A29 0A2684   08A684    5133          LBI    FTO,RDSTATUS        READ MODULE STATUS TAG
1A2A 201385   101385    5134          BU     TIPNOCHK            TAG SUBRTN
1A2B 0B1822   0C9822    5135          MV     W8,FBI              ***********  SENSE BYTE 8
1A2C 2A268F   18A68F    5136          LBI    FTO,CONTROL         CONTROL TAG
1A2D 0A2E83   08AE83    5137          LBI    FBO,SENSTAT1        SENSE STATUS 1
1A2E 201385   101385    5138          BU     TIPNOCHK            TAG SUBRTN
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1A2F 2B1922   1C9922    5139          MV     W9,FBI              ***********  SENSE BYTE 9
1A30 0A2E43   08AE43    5140          LBI    FBO,SENSTAT2        SENSE STATUS 2
1A31 201385   101385    5141          BU     TIPNOCHK            TAG SUBRTN
1A32 2B1A22   1C9A22    5142          MV     W10,FBI             ***********  SENSE BYTE 10
1A33 0A2E23   08AE23    5143          LBI    FBO,SENSTAT3        SENSE STATUS 3
1A34 201385   101385    5144          BU     TIPNOCHK            TAG SUBRTN
1A35 0B1b22   0C9b22    5145          MV     W11,FBI             ***********  SENSE BYTE 11
1A36 0A2E0B   08AE0B    5146          LBI    FBO,SNSRDWR         SENSE READ/WRITE
1A37 201385   101385    5147          BU     TIPNOCHK            TAG SUBRTN
1A38 2B1C22   1C9C22    5148          MV     W12,FBI             ***********  SENSE BYTE 12
                       5149 *
                       5150 *   SENSE BYTES 13, 14 AND 15 ALREADY SET UP
                       5151 *
1A39 289A85   129A85    5152          SABI   BLOCKB,X'85'        SET MULTIPLE BYTE MODE
1A3A 260898   184898    5153          SDEC   W8,L8,8             STORE SENSE BYTES 8-15
1A3B 089A05   029A05    5154          SABI   BLOCKB,X'05'        CHANGE TO SINGLE BYTE MODE
1A3C 2A1200   189200    5155          LBI    W2,0                ***********  SENSE BYTE 18
1A3D 2C971A   12D71A    5156          TEORI  W7,X'1A'            TEST FOR PA CHECK
1A3E 205A47   111A47    5157          BNZ    TSNNT1A             GO IF NOT PA CHECK
1A3F 0A0001   088001    5158          LBI    L0,X'01'            GET PAC
1A40 2400C2   1040C2    5159          LINC   L2,L0,0                AND PAH
1A41 2A0081   188081    5160          LBI    L0,X'81'                FROM HA FIELD
1A42 2440C6   1140C6    5161          LINC   L6,L0,1                     IN DDCF
1A43 2019D9   1019D9    5162          BU     TSNCONV             GO DO CCHH CONVERSION
1A44 2B1402   1C9402    5163          MV     W4,L2               ***********  SENSE BYTE 20
1A45 2B1506   1C9506    5164          MV     W5,L6               ***********  SENSE BYTE 21
1A46 001A50   001A50    5165          B      TSNSNS16            CONTINUE
1A47 2A2689   18A689    5166 TSNNT1A  LBI    FTO,SNSINFC         SENSE INTERFACE TAG
1A48 201385   101385    5167          BU     TIPNOCHK            TAG SUBRTN
1A49 0B1422   0C9422    5168          MV     W4,FBI              ***********  SENSE BYTE 20
1A4A 0E1403   08D403    5169          ANDI   W4,X'03'            SAVE BITS 6-7 ONLY
1A4B 2A2604   18A604    5170          LBI    FTO,RDERROR         READ ERROR TAG
1A4C 0A2E01   08AE01    5171          LBI    FBO,CTLRERR2        RD CONTROLLER ERROR
1A4D 201385   101385    5172          BU     TIPNOCHK            TAG SUBRTN
1A4E 2F5462   1DD462    5173          OR     W4,FBI              SENSE BYTE 20 ALSO
1A4F 0A1500   089500    5174          LBI    W5,0                ***********  SENSE BYTE 21
1A50 2A2604   18A604    5175 TSNSNS16 LBI    FTO,RDERROR         READ ERROR TAG
1A51 0A2E02   08AE02    5176          LBI    FBO,CTLRERR1        RD CONTROLLER ERROR
1A52 201385   101385    5177          BU     TIPNOCHK            TAG SUBRTN
1A53 0B1122   0C9122    5178          MV     W1,FBI              ***********  SENSE BYTE 17
1A54 2A268F   18A68F    5179          LBI    FTO,CONTROL         CONTROL TAG
1A55 2A2E03   18AE03    5180          LBI    FBO,SENSTAT0        SENSE STATUS 0
1A56 201385   101385    5181          BU     TIPNOCHK            TAG SUBRTN
1A57 2B1322   1C9322    5182          MV     W3,FBI              ***********  SENSE BYTE 19 (PARTIAL)
1A58 0A2E13   08AE13    5183          LBI    FBO,SENSTAT4        SENSE STATUS 4
1A59 201385   101385    5184          BU     TIPNOCHK            TAG SUBRTN
1A5A 2B1022   1C9022    5185          MV     W0,FBI              ***********  SENSE BYTE 16
1A5B 0E1304   08D304    5186          ANDI   W3,X'04'            SAVE BIT 5 ONLY
1A5C 07495E   0D495E    5187          TBOFF  5,GEN1,**2          GO IF RD/WR TAG DOWN
1A5D 2E5380   19D380    5188          ORI    W3,X'80'            ***********  SENSE BYTE 19 (CMPLETE)
1A5E 0C9712   02D712    5189          TEORI  W7,X'12'            TEST FOR UPGM DETECTED ERROR
1A5F 005A61   011A61    5190          BNZ    **2                 GO IF NOT
1A60 2B1204   1C9204    5191          MV     W2,L4               ***********  SENSE BYTE 18
1A61 201A80   101A80    5192          BU     TSNSYMCD            GO GENERATE ERROR SYMPTOM CODE
1A62 26906F   1A506F    5193          TBOFF  2,W0,TSNSVOOK       GO IF NOT SERVO OFF TRACK
1A63 2A0401   188401    5194          LBI    L4,1                POST SEEK CHECK
1A64 05C884   074884    5195          SINC   L4,L8,7                IN SENSE BYTE 0
1A65 0408C4   0048C4    5196          LINC   L4,L8,0             FETCH BYTE 7
1A66 0C8415   02C415    5197          TEORI  L4,X'15'            CHECK FOR 15 MSG
1A67 205A69   111A69    5198          BNZ    **2                 GO IF NOT
1A68 2A0410   188410    5199          LBI    L4,X'10'            CHANGE BYTE 7 TO X'10'
1A69 264884   194884    5200          SDEC   L4,L8,7             RESTORE BYTE 7
1A6A 0011F4   0011F4    5201          BU     TIPBSGEN            GENERATE BSDA
1A6B 2A071F   18871F    5202          LBI    L7,D(SKMARK1)       LOAD CS DISPL OF SK INCOMPLETE MARKS
1A6C 2407C6   1047C6    5203          LINC   L6,L7,0             FETCH MARKS
1A6D 0F4642   0DC642    5204          OR     L6,L2               TURN ON SEEK INCOMPLETE FOR THIS DEV
1A6E 040786   004786    5205          SINC   L6,L7,0             STORE MARKS BACK
1A6F 0EC810   08C810    5206 TSNSVOOK ADDI   L8,16              CHANGE CS POINTER TO BYTE 16
1A70 289A85   129A85    5207          SABI   BLOCKB,X'85'        CHANGE TO MULTI BYTE MODE
1A71 240890   104090    5208          SINC   W0,L8,0             STORE BYTES 16-23
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1A72 001B29   001B29  5209          B     TSNEXIT             GO TO SENSE EXIT
                     5210 ********************************************************
                     5211 *       F O R M A T    5     (REGISTER USAGE BELOW)
                     5212 ********************************************************
                     5213 *
                     5214 *   W8 = BYTE 18;   W9 = BYTE 19;  W10 = BYTE 20;   W11 = BYTE 21;
                     5215 *
                     5216 ********************************************************
                     5217 *
1A73 0A0016   088016  5218 TSNFMT5  LBI   L0,D(BYTEREAD)     SET CS PTR TO BYTES READ
1A74 0440DC   0140DC  5219          LINC  W12,L0,1           GET TOTAL
1A75 0400DD   0040DD  5220          LINC  W13,L0,0               BYTES READ
1A76 0EC808   0BC808  5221          ADDI  L8,8               BUMP CS POINTER TO BYTE 16
1A77 04489C   01489C  5222          SINC  W12,L8,1           BYTE 16 -- HIGH RESTART DISPL
1A78 24489D   11489D  5223          SINC  W13,L8,1           BYTE 17 -- LOW RESTART DISPL
1A79 244898   114898  5224          SINC  W8,L8,1            BYTE 18 -- HIGH DISPL
1A7A 044899   014899  5225          SINC  W9,L8,1            BYTE 19 -- LOW DISPL
1A7B 04489A   01489A  5226          SINC  W10,L8,1           BYTE 20 -- HIGH PATTERN
1A7C 24889B   12489B  5227          SINC  W11,L8,2           BYTE 21 -- LOW PATTERN
1A7D 001B04   001B04  5228          B     TSNFMT45           GO FINISH FORMAT 5
                     5229          MBLOK
1A7E 001A7E   001A7E  5230+         B     *                  UNUSED  ::::::::::::
1A7F 201A7F   101A7F  5231+         B     *                  UNUSED  ::::::::::::
1B00                 5232+         DS    <0>B
                     5233 ********************************************************
                     5234 *       F O R M A T    4
                     5235 ********************************************************
                     5236 *
1B00 0EC80E   0BC80E  5237 TSNFMT4  ADDI  L8,14              BUMP CS PTR TO BYTE 22
1B01 2A0749   188749  5238          LBI   L7,X'49'           SET SYMPTOM CODE
1B02 044887   014887  5239          SINC  L7,L8,1            STORE BYTE 22
1B03 040897   004897  5240          SINC  W7,L8,0            STORE BYTE 23 =BYTE 7
1B04 0EC8F1   0BC8F1  5241 TSNFMT45 ADDI  L8,-15             SET CS PTR TO BYTE 8
1B05 2B0217   1C8217  5242          MV    L2,W7              SAVE SENSE BYTE 7
1B06 28C608   138608  5243          SZI   ZLSLOCB,X'08'      RESTORE ORIGINAL ZLS
1B07 2A0082   188082  5244          LBI   L0,X'82'           SET CS PTR TO CYL HIGH IN DDCF
1B08 2A0305   188305  5245          LBI   L3,X'05'           SET DDCF BLOCK ADDRESS
1B09 2C8241   12C241  5246          TEORI L2,X'41'           CHECK FOR COUNT FIELD DATA CHECK
1B0A 005B0F   011B0F  5247          BNZ   TSNFMCF            GO IF NOT
1B0B 26110F   18510F  5248          TIBOF ROCTODF,CEB1,TSNFMCF GO IF NOT RO CNT TO DDDF
1B0C 2A0306   188306  5249          LBI   L3,X'06'           SET DDDF BLOCK ADDRESS
1B0D 06940F   0A540F  5250          TIBOF DDDRODD,MSC2,TSNFMCF GO IF DDDR ON EVEN BOUNDARY
1B0E 2A0003   188003  5251          LBI   L0,X'03'           CORRECT CS PTR
1B0F 0EC220   0BC220  5252 TSNFMCF  ADDI  L2,X'20'           INCR CNTR -- WANT TO LOOP 5 TIMES
1B10 209B29   121B29  5253          BCY   TSNEXIT            GO IF DONE
1B11 299A03   169A03  5254          SABR  L3,BLOCKB          SET BLOCK ADDR
1B12 2400C7   1040C7  5255          LINC  L7,L0,0            FETCH (CCHHR) IN SEQUENCE
1B13 089A05   029A05  5256          SABI  BLOCKB,X'05'       SET BLOCK ADDR
1B14 044887   014887  5257          SINC  L7,L8,1            STORE SENSE BYTES 8-12 IN SEQUENCE
1B15 2EC080   1BC080  5258          ADDI  L0,X'80'           BUMP CS
1B16 2F4010   1DC010  5259          ADDC  L0,ZER                 POINTER
1B17 201B0F   101B0F  5260          B     TSNFMCF            GO SET UP THE NEXT BYTE
                     5261 ************************************************************
                     5262 *       F O R M A T    2     (REGISTER USAGE BELOW)
                     5263 ************************************************************
                     5264 *
                     5265 *  W8  = BYTE  8(HES); W9  = BYTE  9(ADS); W10 = BYTE 10(FTI);
                     5266 *  W11 = BYTE 11(DST); W12 = BYTE 12(FHF); W13 = BYTE 13(F80);
                     5267 *  W14 = BYTE 14(F81); W15 = BYTE 15(FTO);
                     5268 *  ALSO:               W14 = BYTE 16(SCN); W15 = BYTE 17(DXC);
                     5269 *
                     5270 ************************************************************
                     5271 *
1B18 2B1B23   1C9B23  5272 TSNFMT2  MV    W11,DST            COPY DST
1B19 2B1C27   1C9C27  5273          MV    W12,FHF            COPY FHF
1B1A 289A85   129A85  5274          SABI  BLOCKB,X'85'       MULTIPLE BYTE MODE
1B1B 040898   004898  5275          SINC  W8,L8,0            STORE SENSE BYTES  8-15
1B1C 2B1E2F   1C9E2F  5276          MV    W14,SCN            COPY SCN
1B1D 231F33   1C9F33  5277          MV    W15,DXC            COPY DXC
1B1E 201B27   101B27  5278          B     TSNBY16            GO TO STORE BYTES 16 AND 17
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                     5279 ********************************************************
                     5280 *       F O R M A T    6     (REGISTER USAGE BELOW)
                     5281 ********************************************************
                     5282 *
                     5283 *   W4 = BYTE  8;   W5 = BYTE  9;   W6 = BYTE 10;   W7 = BYTE 11;
                     5284 *   W14= BYTE 16;   W15= BYTE 17;           L4-L7 = ZERO
                     5285 *
                     5286 ********************************************************
                     5287 *
1B1F 289A85   129A85  5288 TSNFMT6  SABI  BLOCKB,X'85'       CHANGE TO MULTI BYTE MODE
1B20 2EC814   1BC814  5289          ADDI  L8,20              BUMP POINTER TO USAGE CNTR AREA
1B21 2408D4   1048D4  5290          LINC  W4,L8,0            FETCH READ USAGE CNTR
1B22 050884   044884  5291          SINC  L4,L8,4            RESET READ USAGE CNTRS
1B23 2408DE   1048DE  5292          LINC  W14,L8,0           FETCH SEEK USAGE CNTR
1B24 040886   004886  5293          SINC  L6,L8,0            RESET SEEK USAGE CNTR
1B25 2EC8E8   1BC8E8  5294          ADDI  L8,-24             CHANGE CS POINTER TO BYTE 8
1B26 040894   004894  5295 TSNSKNFL SINC  W4,L8,0            STORE BYTES 8-11
1B27 0EC808   0BC808  5296 TSNBY16  ADDI  L8,8               BUMP CS POINTER TO BYTE 16
1B28 04089E   00489E  5297          SINC  W14,L8,0           STORE BYTES 16-17
                     5298 ************************************
                     5299 *    SENSE BYTES ALL SET UP NOW
                     5300 ************************************
1B29                 5301 TSNEXIT EQU   *                   ENTRY LABEL
1B29 28C608   138608  5302          SZI   ZLSLOCB,X'08'      RESTORE ORIGINAL ZLS
1B2A 089A05   029A05  5303          SABI  BLOCKB,X'05'       RESTORE ORIGINAL BLOCK ADDR
                     5304 *
                     5305 *    RESET CONTROLLER AND DRIVE CHECKS HERE
                     5306 *
1B2B 0A2E04   08AE04  5307          LBI   FB0,RSTATTN        RESET
1B2C 2A268F   18A68F  5308          LBI   FTO,CONTROL            ATTENTION
1B2D 2013B5   1013B5  5309          BU    TIPNOCHK           TAG SUBRTN
1B2E 2A2E0C   18AE0C  5310          LBI   FB0,CHKRST         CHECK RESET
1B2F 2013B5   1013B5  5311          BU    TIPNOCHK           TAG SUBRTN
1B30 0A2E80   08AE80  5312          LBI   FB0,X'80'          CONTROLLER
1B31 0A2609   08A609  5313          LBI   FTO,XMITCNTL            RESET
1B32 2013B5   1013B5  5314          BU    TIPNOCHK           TAG SUBRTN
1B33 0E6D80   09ED80  5315          ORI   FTR,ADTCKRST       RAISE ADAPTER CHECK RESET
1B34 2E2D7F   18ED7F  5316          ANDI  FTR,FF-ADTCKRST    DROP ADT CHECK RESET
                     5317 *
                     5318 *    EXIT DECISION
                     5319 *
1B35 240B3C   104B3C  5320          TIBON ERRRETUN,STAT,TSNIDLE  GO IF RETURN MARK ON
1B36 278B3B   1E4B3B  5321          TIBOF UNITCHK,STAT,*+5   GO IF UNIT CHECK OFF (RD/RST BUF LOG)
1B37 278C3A   1E4C3A  5322          TBOFF 6,QBYT,*+3         GO IF NOT SCAN CMD (IF BITS 6 & 7
1B38 07CC3A   0F4C3A  5323          TBOFF 7,QBYT,*+2         ARE ON = SCAN. DON'T XFER DDDF TO MS)
1B39 2E09F7   18C9F7  5324          ANDI  GEN1,FF-XFRDDDF    RESET XFR DDDF MARK FOR SCAN CMD
1B3A 000951   000951  5325          B     TENSTART           GO TO END PROCEDURE
1B3B 20176C   10176C  5326          B     TSKRDSNS           GO TO XFER SENSE BYTES
1B3C 2A001E   18801E  5327 TSNIDLE  LBI   L0,D(UCWPTR)        GET DISPL OF UCW POINTER
1B3D 2400C8   1040C8  5328          LINC  L8,L0,0            GET UCW POINTER
1B3E 2A0110   188110  5329          LBI   L1,X'10'           INITIALIZE BSDA TO DRIVE 4
1B3F 240841   104841  5330          TBON  0,L8,*+2           GO IF DRIVE 3 OR 4
1B40 2A0140   188140  5331          LBI   L1,X'40'           CHANGE BSDA TO DRIVE 2
1B41 058843   064843  5332          TBON  6,L8,*+2           GO IF DRIVE 2 OR 4
1B42 2F0101   1CC101  5333          ADD   L1,L1              CHANGE BSDA TO DRIVE 1 OR 3
1B43 2B4201   1D8201  5334          MVX   L2,L1              MOVE BSDA TO LOW DIGIT IN L2
1B44 2001C4   1001C4  5335          BU    TCUSETUC           POST UNIT CHECK STATUS IN SB0
1B45 27CB48   1F4B48  5336          TIBOF SKCMPL,STAT,*+3    GO IF NOT SEEK COMPLETE
1B46 0A0B00   088B00  5337          LBI   STAT,0             ZERO STAT REG
1B47 001300   001300  5338          B     TIPSKCHK           GO CONTINUE TO HANDLE SK INCOMPLETE
1B48 0A0B00   088B00  5339          LBI   STAT,0             ZERO STAT REG
1B49 0E25BF   08E5BF  5340          ANDI  FTG,FF-SELHOLD     DESELECT DRIVE
1B4A 001202   001202  5341          B     TIPIDLE            GO TO IDLE LOOP
                     5342 *
                     5343 ************************************************************
                     5344 *   TIME OUT ON SEEK BUSY'S                                *
                     5345 ************************************************************
                     5346 *
1B4B 2A0022   188022  5347 TSNSKTMR LBI   LO,D(SBFLAGS)      LO --> SEEK BUSY FLAGS
1B4C 0440C1   0140C1  5348          LINC  L1,LO,1            LOAD SEEK BUSY FLAGS &
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1B4D 27C0C2  1F40C2  5349          LDEC  L2,L0,1          TIMER IN L1 & L2
1B4E 0B033F  0C833F  5350          MV    L3,S80          MOVE S80 TO WORK REG
1B4F 2C030F  10C30F  5351          TANDI L3,X'0F'        CHECK FOR ANY SEEK BUSY'S
1B50 225863  191863  5352          BZ    TSNNOSB           GO IF NONE
1B51 2E43F0  19C3F0  5353          ORI   L3,X'F0'        SET TIMER BITS IN WORK REG
1B52 2F0143  1CC143  5354          AND   L1,L3           AND FLAGS WITH SEEK BUSY BITS
1B53 0C010F  0DC10F  5355          TANDI L1,X'0F'        CHECK FOR SEEK BUSY'S STILL ON
1B54 225865  191865  5356          BZ    TSNNTSAM          GO IF NONE
1B55 0EC110  0BC110  5357          ADDI  L1,X'10'        BUMP
1B56 0F4210  0DC210  5358          ADDC  L2,ZER              TIMER
1B57 029868  0A1B68  5359          BNC   TSNRSTOR        GO IF NOT TIMEOUT
1B58 284101  1D8101  5360          MVX   L1,L1           FORM BSDA FOR DRIVE WITH SEEK BUSY
1B59 2A00FF  1880FF  5361          LBI   L0,FF           INIT DRV ADDR TO ZERO
1B5A 0B0801  0C8801  5362          MV    L8,L1           COPY BSDA
1B5B 2EC001  18C001  5363          ADDI  L0,1            INCR DRIVE ADDR
1B5C 2F0808  1CC808  5364          ADD   L8,L8           SHIFT BSDA
1B5D 029B5B  0A1B5B  5365          BNC   *-2             LOOP TILL CARRY
1B5E 0011F8  0011F8  5366          BU    TIPSLECT        GO SELECT DRIVE THAT TIMED OUT
1B5F 0A0B81  088B81  5367          LBI   STAT,X'81'        POST ERROR RETURN & SEEK COMPLETE
1B60 2A081C  18881C  5368          LBI   L8,X'1C'        POST NO INTERRUPT FROM DRIVE
1B61 0A0703  088703  5369          LBI   L7,X'03'        POST EQUIPMENT CHECK
1B62 20124E  10124E  5370          B     TIPUCW          GO SAVE UCWPTR, LOAD PA & POST ERROR
1B63 0A0100  088100  5371 TSNNOSB  LBI   L1,0           CLEAR FLAGS &
1B64 001B67  001B67  5372          B     *+3               TIMER
1B65 0E030F  08C30F  5373 TSNNTSAM ANDI  L3,X'0F'        MASK OFF TIMER BITS
1B66 2B01C3  1C8103  5374          MV    L1,L3           SET FLAGS &
1B67 0A02J0  088200  5375          LBI   L2,0              CLEAR TIMER
1B68 244081  114081  5376 TSNRSTOR SINC  L1,L0,1        RETURN FLAGS &
1B69 07C082  0F4082  5377          SDEC  L2,L0,1           TIMER TO CONTROL STORE
1B6A 0F90D0  0ED0D0  5378          EGRU  ZER,ZER         RETURN TO IDLE
                     5379 *
1B6B 2A0003  188003  5380 TSNWIN3  LBI   L0,D(DDCFORGL+3)  DISPLACEMENT OF CLO
1B6C 0A0182  088182  5381          LBI   L1,D(DDCFORGR+2)  DISPLACEMENT OF CHI
1B6D 20185C  10185C  5382          B     TSKWIN3           GO CONVERT ADDRESS
                     5383          END COPY-MEMBER TSN12
                     5384      COPY      TWR12
                     5385 ********************************************
                     5386 *  SUBROUTINE TO SET EVEN OR ODD HEAD
                     5387 ********************************************
                     5388 *
1B6E 0CD9E7  03D9E7  5389 TWRSETHD TADDI REC,231           TEST FOR RECORD 25
1B6F 209B73  121B73  5390          BCY   TWRODDHD          GO IF 25 OR GREATER
1B70 3E0FFE  18CFFE  5391 TWREVNHD ANDI  PAH,X'FE'        SET EVEN HEAD
1B71 2E18FE  18D8FE  5392          ANDI  HEAD,X'FE'        SET EVEN HEAD
1B72 001B75  001B75  5393          B     TWRHDSET          CONTINUE
1B73 0E4F01  09CF01  5394 TWRODDHD ORI   PAH,X'01'        SET ODD HEAD
1B74 0E5801  09D801  5395          ORI   HEAD,X'01'        SET ODD HEAD
1B75 0A0004  088004  5396 TWRHDSET LBI   L0,D(DDCFORGL+4)  HEAD ADDRESS IN DDCF
1B76 2400C2  1040C2  5397          LINC  L2,L0,0           FETCH HEAD BYTE
1B77 2E4201  19C201  5398          ORI   L2,X'01'          FORCE IT ODD
1B78 05D87A  07587A  5399          TBON  7,HEAD,*+2        GO IF ODD HEAD
1B79 0E02FE  08C2FE  5400          ANDI  L2,X'FE'          FORCE IT EVEN
1B7A 040082  004082  5401          SINC  L2,L0,0           STORE IT BACK
1B7B 2B100F  1C900F  5402          MV    ZER,PAH           MOVE PAH TO WORK REG
1B7C 0E101F  08D01F  5403          ANDI  ZER,X'1F'         SAVE HEAD BITS
1B7D 0A26EB  08A6EB  5404          LBI   FTO,X'EB'         SET HAR TAG TO FTO
1B7E 2B2E10  1CAE10  5405          MV    FBO,ZER           HEAD TO BUS OUT
1B7F 001503  001503  5406          B     TRDSBTIM          GO RAISE TAG GATE AND RETURN
                     5407          MBLOK
1C00                 5408+         DS    <0>B
                     5409 ********************************************************
                     5410 *  ENTRY FOR WRITE KEY-DATA, WRITE REPEAT KEY-DATA
                     5411 ********************************************************
                     5412 *
1C00 28061C  1C861C  5413 TWRKD    MV    L6,NREC           SET NUMBER OF RECORDS FOR CHAN FETCH
1C01 0E4940  09C940  5414          ORI   GEN1,FINCHXFR     FINISH CHANNEL TRANSFER MARK
1C02 201C04  101C04  5415          B     *+2               CONTINUE
1C03 280610  1C8610  5416 TWRRKD   MV    L6,ZER            SET N=0 FOR CHANNEL FETCH
1C04 269132  1A5132  5417          TIBOF WRENABLE,CEB1,TWRL800  GO IF WRITE NOT PERMITTED
1C05 079407  0E5407  5418          TIBOF KDGT256,MSC2,*+2  GO IF (KL+DL) NOT > 256
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1C06 201818  101818  5419 TWRGT256 B     TSKINVSK          GO SET UP CMD REJECT
1C07 2018EE  1018EE  5420          BU    TWRSETHD          SET HEAD
1C08 200780  100780  5421          BU    TEFSETRW          SET READ/WRITE TAG
1C09 001E80  001E80  5422          BU    TWRCHCNT          SET UP CHANNEL COUNT
1C0A 05CD0C  074D0C  5423          TBON  7,RBYT,*+2        GO IF WRITE REPEAT KEY-DATA CMD
1C0B 2E0803  18C803  5424          ANDI  L8,X'03'          MASK CONTROL BYTE FOR WRITE KEY-DATA
1C0C 0B0208  0C8208  5425          MV    L2,L8             SAVE CONTROL BYTE FOR CHNL CNTR CHK
1C0D 001DD5  001DD5  5426          BU    TWRFDDDF          FETCH DDDF FROM CHANNEL
1C0E 27CD11  1F4D11  5427          TBOFF 7,RBYT,TWRWSRW    GO IF WRITE KEY-DATA COMMAND
1C0F 0A086A  08886A  5428          LBI   L8,D(TWRTWRA1)    RETURN DISPLACEMENT FOR SUBROUTINE
1C10 201E5C  101E5C  5429          B     TWRCHEDR          GO CHECK AND RESTORE DDDR
1C11                 5430 TWRTWRB1 EQU   *
1C11 2014D4  1014D4  5431 TWRWSRW  BU    TRDRWEND          WAIT FOR END OF SET READ/WRITE
1C12 0E5220  09D220  5432          ORI   CEB2,WRITE        WRITE MARK
1C13 2E5103  19D103  5433          ORI   CEB1,PROCKEY+PROCDAT  WRITE KEY AND DATA
1C14 0E4920  09C920  5434          ORI   GEN1,FIXDDCF      RESTORE DDCF MARK FOR END PROCEDURE
1C15 28D2CE  1392CE  5435          SZI   ZLSFD,ZLSWFILE    SET ZLS FOR FILE WRITE FROM DDDF
1C16 0E5360  09D360  5436          ORI   MSC1,MUTRK+MUREC  MULTI-TRACK AND MULTI-RECORD
1C17 2E5244  19D244  5437          ORI   CEB2,ENDCNT+SRCH  SEARCH, ORIENT TO END OF COUNT FIELD
1C18 201444  101444  5438          B     TRDG3AM           GO SET UP TO FIND A COUNT FIELD
                     5439 ********************************************************************
                     5440 *  ENTRY FOR WRITE HA AND R0 EVEN/ODD, WRITE CKD AND WRITE R0 ODD
                     5441 ********************************************************************
                     5442 *
1C19                 5443 TWRHAROE EQU   *               COMMON ENTRY POINT FOR WRITE HA
1C19 0A0821  088821  5444 TWRHAROO LBI   L8,D(SVPOPT)    FETCH DISP OF SVP OPTION BYTE IN CS
1C1A 0408C8  0048C8  5445          LINC  L8,L8,0         FETCH THE SVP OPTION BYTE
1C1B 250825  144825  5446          TIBON ALWRTHA,L8,TWRSVPOP  GO IF SVP OPTION SET TO ALLOW WRT HA
1C1C 250D20  144D20  5447          TBON  4,RBYT,TWRODDH    GO IF CMD IS WRITE HA ODD
1C1D 07CF21  0F4F21  5448          TBOFF 7,PAH,TWRCHKFL    CMD IS EVEN, GO IF PAH IS EVEN
1C1E 2A0802  188802  5449 TWRL802  LBI   L8,X'02'          FORMAT 0, MESSAGE 2
1C1F 001104  001104  5450          B     TIOL700           COMMAND REJECT, INVALID SEQUENCE
1C20 07CF1E  0F4F1E  5451 TWRODDH  TBOFF 7,PAH,TWRL802     CMD IS ODD, GO IF PAH IS EVEN
1C21 2C15E0  10D5E0  5452 TWRCHKFL TANDI FLAG,X'E0'        TEST FOR ALLOW WRITE HA OVERRIDE
1C22 005C2C  011C2C  5453          BNZ   TWRWHAOK          GO IF ANY BIT IS ON
1C23 07121E  0C521E  5454          TIBOF WHAOK,CEB2,TWRL802  GO IF CMD NOT PRECEDED BY READ HA
1C24 201C2C  101C2C  5455          B     TWRWHAOK          CONTINUE
1C25 2A081A  18881A  5456 TWRSVPOP LBI   L8,D(SDFORHA)     FETCH DISP OF SDFORHA IN C STORE
1C26 044890  014890  5457          SINC  ZER,L8,1          FORCE SD BYTES
1C27 240890  104890  5458          SINC  ZER,L8,0            TO ZERO
1C28 050D2B  044D2B  5459          TBON  4,RBYT,TWRROO     GO IF ODD HEAD REQUIRED
1C29 2018F0  1018F0  5460          BU    TWREVNHD          SET EVEN HEAD
1C2A 201C2C  101C2C  5461          B     *+2               GO TO TWRWHAOK
1C2B 2018F3  1018F3  5462 TWRROO   BU    TWRODDHD          SET ODD HEAD
1C2C 2A0084  188084  5463 TWRWHAOK LBI   L0,D(DDCFORGR+4)   DISPLACEMENT OF R IN DDCF
1C2D 248090  124090  5464          SINC  ZER,L0,2          SET R TO ZERO FOR THIS COMMAND
1C2E 040090  004090  5465          SINC  ZER,L0,0          SET N TO ZERO FOR THIS COMMAND
1C2F 0A1900  089900  5466          LBI   REC,0             SET R TO ZERO IN ZLS TOO
1C30 0A1C00  089C00  5467          LBI   NREC,0            SET N IN DLS TO ZERO TOO
1C31 249135  125135  5468 TWRCKD   TIBON WRENABLE,CEB1,TWRWROK  GO IF WRITE IS OK
1C32 0A0800  088800  5469 TWRL800  LBI   L8,X'00'          FORMAT 0, MESSAGE 0
1C33 2A0780  188780  5470 TWRL780  LBI   L7,X'80'          COMMAND REJECT,
1C34 201408  101908  5471          B     TSNNORM             WRITE INHIBITED
1C35 059406  065406  5472 TWRWROK  TIBON KDGT256,MSC2,TWRGT256  GO IF (KL+DL) IS > 256
1C36 0E15E3  08D5E3  5473          ANDI  FLAG,X'E3'        ZERO UNWANTED BITS
1C37 260610  1C8610  5474          MV    L6,ZER            N IS ZERO FOR FOLLOWING SUBROUTINE
1C38 200780  100780  5475          BU    TEFSETRW          SET READ/WRITE TAG
1C39 001E80  001E80  5476          BU    TWRCHCNT          SET THE CHANNEL COUNTER
1C3A 0B0208  0C8208  5477          MV    L2,L8             SAVE CONTROL BYTE FOR CHAN CNTR CHK
1C3B 001DD5  001DD5  5478          BU    TWRFDDDF          FETCH DDDF FROM CHANNEL
1C3C 2A086B  18886B  5479          LBI   L8,D(TWRTWRA2)    LOAD DISPLACEMENT FOR SUBR RETURN
1C3D 201E5C  101E5C  5480          B     TWRCHEDR          GO CHECK AND RESTORE DDDR
1C3E 200280  100280  5481 TWRTWRB2 BU    TDSDCON           SET CONSTANTS FOR SD ANALYSIS
1C3F 2014D4  1014D4  5482          BU    TRDRWEND          WAIT FOR END OF SET READ/WRITE
1C40 0E5220  09D220  5483          ORI   CEB2,WRITE        WRITE OP MARK
1C41 28D2CE  1392CE  5484          SZI   ZLSFD,ZLSWFILE    SET ZLS TO WRITE FILE FROM DDDF
1C42 05CD53  074D53  5485          TBON  7,RBYT,TWRHARO    GO IF WRITE HA
1C43 254D53  154D53  5486          TBON  5,RBYT,TWRHARO      OR IF WRITE R0 ODD
                     5487 *    WRITE COUNT-KEY-DATA
1C44 2E5147  19D147  5488          ORI   CEB1,FMTWR+PROCKEY+PROCDAT+PROCNT  SET XEQION MARKS
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1C45 0E4920  09C920   5489            ORI   GEN1,FIXDDCF          RESTORE DDCF MARK FOR END PROCEDURE
1C46 26D951  185951   5490            TBOFF 3,REC,TWRCKDR0        GO IF RECORD ZERO
1C47 2E5320  19D320   5491            ORI   MSC1,MUREC            MULTIPLE RECORD, NOT MULTI-TRACK
1C48 0E5240  09D240   5492            ORI   CEB2,SRCH             SET SEARCH MARK
1C49 2ED9FF  1BD9FF   5493            ADDI  REC,FF                DECREMENT RECORD NUMBER
1C4A 0E6D01  09ED01   5494 TWRRDG1    ORI   FTR,ALLOWIDX          TURN ON ALLOW INDEX
1C4B 0003E0  0003E0   5495            BU    TDXWADEX              WAIT FOR INDEX
1C4C 0A2684  08A684   5496            LBI   FTO,RDSTATUS          READ MODULE STATUS
1C4D 001584  001584   5497            BU    TRDNOFBI
1C4E 25E250  176250   5498            TBON  7,FBI,*+2             GO IF ACTIVE TRACK
1C4F 0003E0  0003E0   5499            BU    TDXWADEX              WAIT FOR INDEX
1C50 20144B  10144B   5500            B     TRDRDG1               CONTINUE
1C51 2E910C  1AD10C   5501 TWRCKDR0   EORI  CEB1,PROCR0+PROCNT     PROCESS R0 COUNT FIELD MARK
1C52 20144B  10144B   5502 TWRG10P    B     TRDRDG1               CONTINUE
                      5503 *     WRITE HA & R0 OR WRITE R0 ODD
1C53 2E5148  19D148   5504 TWRHAR0    ORI   CEB1,FMTWR+PROCR0+PROCKEY+PROCDAT   SET MARKS FOR OPS
1C54 07CD52  0F4D52   5505            TBOFF 7,RBYT,TWRG10P        GO IF NOT WRITE HA
                      5506 *     WRITE HA CONTINUES HERE
1C55 0A001A  08801A   5507 TWRHA     LBI   L0,D(SDFORHA)         DISPLACEMENT OF STORED SD BYTES
1C56 2440DD  1140DD   5508            LINC  SDH,L0,1              FETCH SDH
1C57 0400DE  0040DE   5509            LINC  SDL,L0,0              FETCH SDL
                      5510 *     FLAG BYTE PROCESSING
1C58 0B1F15  0C9F15   5511            MV    FFLG,FLAG             FETCH S/3 FLAG AS A STARTER
1C59 2E1F03  18DF03   5512            ANDI  FFLG,X'03'            TURN OFF ALL BUT ALT TRK & FLG BITS
1C5A 26155E  18555E   5513            TBOFF 0,FLAG,TWRNMHA        GO IF NOT MOVE HA
1C5B 2A1D00  189D00   5514            LBI   SDH,0                 SET
1C5C 0A1E6E  089E6E   5515            LBI   SDL,110                   SKIP DISP
1C5D 001C65  001C65   5516            B     TWRNMANY                AND WRITE HA DISPLACED
1C5E 065562  095562   5517 TWRNMHA    TBOFF 1,FLAG,TWRNMR0        GO IF NOT MOVE R0
1C5F 2A1D00  189D00   5518            LBI   SDH,0                 SET
1C60 0A1EC8  089EC8   5519            LBI   SDL,200                   SKIP DISPLACEMENT
1C61 001C65  001C65   5520            B     TWRNMANY                AND GO WRITE HA
1C62 269565  1A5565   5521 TWRNMR0    TBOFF 2,FLAG,TWRNMANY       GO IF NOT MOVE R0 DATA FIELD
1C63 0A1D01  089D01   5522            LBI   SDH,1                 SKIP DISP
1C64 2A1E1D  189E1D   5523            LBI   SDL,29                  IS 285 FOR MOVE R0 DATA FIELD
1C65 2A0000  188000   5524 TWRNMANY  LBI   L0,D(DDCFORGL)         DISPLACEMENT OF SDH
1C66 2A0180  188180   5525            LBI   L1,D(DDCFORGR)        DISPLACEMENT OF SDL
1C67 04409D  01409D   5526            SINC  SDH,L0,1              STORE DISPLACEMENT
1C68 24419E  11419E   5527            SINC  SDL,L1,1                      VALUES
1C69 24408E  11408E   5528            SINC  PAC,L0,1              STORE PA
1C6A 07C18F  0F418F   5529            SDEC  PAH,L1,1                      VALUES
1C6B 0A2E49  08AE49   5530            LBI   FB0,FMTG1+9           SET FB0 FOR WRITE G1
1C6C 0D5D5E  05DD5E   5531            TOR   SDH,SDL               TEST SD FOR ZERO
1C6D 225C79  191C79   5532            BZ    TWRSTFLG              GO STORE FLAG IF IT IS
1C6E 0A02FF  0982FF   5533            LBI   L2,FF                 INIT L2 TO -1
1C6F 2CDE4D  13DE4D   5534            TADDI SDL,77                CHECK TO SEE IF
1C70 0D5D02  05DD02   5535            TADDC SDH,L2                  0<SD<179
1C71 209C74  121C74   5536            BCY   *+3                   GO IF IT IS NOT
1C72 2A2EC9  18AEC9   5537            LBI   FB0,SPFMTG1+9         SET FB0 TO WRITE MOVED HA
1C73 201C79  101C79   5538            B     TWRSTFLG              GO STORE FLAG BYTE
1C74 0A03FE  0883FE   5539            LBI   L3,X'FE'              SET CONSTANT TO L3 TO CHECK ROC
1C75 2CDEF9  13DEF9   5540            TADDI SDL,X'F9'             CHECK TO SEE IF
1C76 2D5D03  15DD03   5541            TADDC SDH,L3                  SD>262
1C77 009C79  021C79   5542            BCY   TWRSTFLG              GO IF IT IS NOT
1C78 2E5F80  19DF80   5543            ORI   FFLG,X'80'            SET BIT FOR COUNT FIELD DEFECT
1C79 27809F  1E409F   5544 TWRSTFLG  SDEC  FFLG,L0,2              STORE FLAG
1C7A 2A0708  188708   5545            LBI   L7,8                  FILE COUNT
1C7B 0E5110  09D110   5546            ORI   CEB1,PADTOIDX         SET PADDING MARK
1C7C 28D1CE  1391CE   5547            SZI   ZLSFC,ZLSWFILE        SET ZLS TO WRITE FILE FROM DDCF
1C7D 0A260F  08A60F   5548            LBI   FTO,WRITEOP           WRITE TAG TO FTO
1C7E 20144E  10144E   5549            B     TRDENTRY              FINISH SET UP AND GO TO ISSUE WR G1
                      5550            MBLOK
1C7F 201C7F  101C7F   5551+           B     *                     UNUSED  ::::::::::::
1D00                  5552+           DS    <0>8
                      5553 ************************************************
                      5554 *  THIS ROUTINE WRITES R0/RN COUNT FIELD
                      5555 ************************************************
                      5556 *
1D00 0E11F3  08D1F3   5557 TWRCOUNT  ANDI  CEB1,FF-PROCR0-PROCNT   TURN OFF CMD XEQ MARKS
1D01 0E2F40  0ELF40   5558            ANDI  SCN,X'40'             RESET FILE DATA XFER CONTROLS
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1D02 241216  105216   5559            TIBON READ,CEB2,TWRSPCNT    GO SPACE CNT IF RD CKD DIAG CMD
1D03 061F05  085F05   5560            TIBOF DEFCNT,FFLG,*+2       GO IF COUNT NBT MOVED
1D04 0001EB  0001EB   5561            BU    TDSWRG4               GO WRITE G4 GAP
1D05 0E1F1F  08DF1F   5562            ANDI  FFLG,X'1F'            MASK OFF DEFECT MARKS IN FLAG
1D06 000380  000380   5563            BU    TDSSTART              GO DO DEF ANALYSIS AND SET UP COUNT
1D07 0A260F  08A60F   5564            LBI   FTO,WRITEOP           SET WRITE OP
1D08 0A2E5D  08AE5D   5565            LBI   FB0,FMTG3+13          SET WRITE G3 WITH LENGTH OF 13
1D09 05D20B  07520B   5566            TBON  7,CEB2,*+2            GO IF AFTER DATA FIELD
1D0A 0A2E6D  08AE6D   5567            LBI   FB0,FMTG2+13          SET WRITE R0
1D0B 27930D  1E530D   5568            TIBOF ERASE,MSC1,*+2        GO IF ERASE MARK OFF
1D0C 2A2E7D  18AE7D   5569            LBI   FB0,FMTERASE+13       SET FMT ERASE
1D0D 28D1CE  1391CE   5570            SZI   ZLSFC,ZLSWFILE        SET ZLS TO LOAD
1D0E 0E5110  09D110   5571            ORI   CEB1,PADTOIDX         TURN ON PADDING BIT
1D0F 088520  028520   5572 TWRCOM1   SABI  INDEXF1,IDXDDCF        SET INDEX TO POINT TO DDCF
1D10 288720  128720   5573            SABI  INDEXF2,IDXDDCF               "
1D11 08A600  02A600   5574            SADI  DISPFC,D(DDCFORG)     SET CS DISPLACEMENT TO DDCF
1D12 0A070C  08870C   5575 TWRCOM2   LBI   L7,12                 LOAD FILE BYTE COUNTER
1D13 2ED201  18D201   5576            ADDI  CEB2,1                UPDATE TRK ORIENT TO END OF ROC/CNT
1D14 2A04FE  1884FE   5577 TWR120US  LBI   L4,-2                 LOAD 120 USEC TIMER
1D15 00070C  00070C   5578            B     TEFWAIT               GO WAIT FOR OP COMPLETE
                      5579 ************************************************
                      5580 *  THIS ROUTINE SPACES R0/RN COUNT FIELD
                      5581 ************************************************
                      5582 *
1D16 061F18  085F18   5583 TWRSPCNT  TIBOF DEFCNT,FFLG,*+2       GO IF COUNT NBT MOVED
1D17 0001E8  0001E8   5584            BU    TDSRDG4               GO READ  G4 GAP
1D18 0E1F1F  08DF1F   5585            ANDI  FFLG,X'1F'            MASK OFF DEFECT MARKS IN FLAG
1D19 000380  000380   5586            BU    TDSSTART              GO DO DEF ANALYSIS AND SET UP COUNT
1D1A 2A2E1D  18AE1D   5587            LBI   FB0,CLKG3+13          SET CLOCK REGULAR COUNT
1D1B 25D21D  17521D   5588            TBON  7,CEB2,*+2            GO IF AFTER DATA FIELD
1D1C 2A2E2D  18AE2D   5589            LBI   FB0,CLKG2+13          SET CLOCK RC CNT
1D1D 2E6F01  19EF01   5590            ORI   SCN,NFILEXFR          SET INHIBIT DATA XFER
1D1E 201D12  101D12   5591            B     TWRCOM2               MERGE TO SET UP FCT
                      5592 ************************************************
                      5593 *     THIS ROUTINE WRITES KEY FIELD
                      5594 ************************************************
                      5595 *
1D1F 2E11F0  18D1FD   5596 TWRKEY    ANDI  CEB1,FF-PROCKEY       TURN OFF PROCESS KEY MARK
1D20 2E2FF0  18EFF0   5597            ANDI  SCN,X'F0'             TURN OFF FILE DATA XFER CONTROLS
1D21 2E12F8  18D2F8   5598            ANDI  CEB2,X'F8'            UPDATE TRACK ORIENT
1D22 0E5202  09D202   5599            ORI   CEB2,ENDKEY               TO END OF KEY FIELD
1D23 088540  028540   5600            SABI  INDEXF1,IDXDDDF       SET PGM POINTER TO DDDF
1D24 288740  128740   5601            SABI  INDEXF2,IDXDDDF               "
1D25 26CD2C  184D2C   5602            TBOFF 3,RBYT,TWRKDCMD       GO IF WRITE K-D COMMAND
1D26 08AA00  02AA00   5603            SADI  DISPFD,D(DDDFORG)     SET CS DISPLACEMENT
1D27 2E09FE  18C9FE   5604            ANDI  GEN1,FF-ODDXFER       RESET FILE ODD SWITCH
1D28 26942F  1A542F   5605            TIBOF DDRODD,MSC2,TWRMRG1 GO IF NOT ODD ADDR BOUNDARY
1D29 0E4901  09C901   5606            ORI   GEN1,ODDXFER          TURN ON FILE ODD XFER SWITCH
1D2A 2E6F04  19EF04   5607            URI   SCN,FILEODD           SET FILE ODD XFER
1D2B 001D2F  001D2F   5608            B     TWRMRG1
1D2C 07C92E  0F492E   5609 TWRKDCMD  TBOFF 7,GEN1,*+2            GO IF NOT ODD ADDR BOUNDARY
1D2D 2E6F04  19EF04   5610            ORI   SCN,FILEODD           SET FILE ODD XFER
1D2E 0E7304  09F304   5611            ORI   DXC,ALOWFILE          SET ALLOW DIFF COUNTER FILE
1D2F 28D2CE  1392CE   5612 TWRMRG1   SZI   ZLSFD,ZLSWFILE        SET ZLS TO LOAD
1D30 06DA3F  085A3F   5613            TBOFF 3,KCNT,TWRDATA        GO TO WRITE DATA IF KCNT = 0
1D31 0B071A  0C871A   5614            MV    L7,KCNT               COPY KCNT
1D32 265F35  195F35   5615            TIBOF DEFKEY,FFLG,*+3       GO IF NO DEFECT IN KEY
1D33 04DE50  035E50   5616 TWRCHKSP  TBON  3,SDL,TWRSPKD          GO IF FIELD IS SPLIT
1D34 0001EB  0001EB   5617            BU    TDSWRG4               GO WRITE G4
1D35 0A0620  088620   5618 TWRNODEF  LBI   L6,WRG2                SET UP WRITE MODIFIER
1D36 0A260F  08A60F   5619 TWRMRG2   LBI   FTO,WRITEOP            SET WRITE OP
1D37 2B2E07  1CAE07   5620 TWRRWCOM  MV    FB0,L7                LOAD MODULO 16 COUNT
1D38 0E2E0F  08EE0F   5621            ANDI  FB0,X'0F'                 TO FILE BUS OUT
1D39 2F6E46  1DEE46   5622            OR    FB0,L6                SET TAG MODIFIER
1D3A 2E6580  19E580   5623            ORI   FTG,TAGATE            TURN ON TAG GATE
1D3B 07C73D  0F473D   5624            TBOFF 7,L7,*+2              GO IF FIELD LENGTH IS EVEN
1D3C 0E8901  0AC901   5625            EORI  GEN1,1                FLIP FILE ODD XFER SWITCH
1D3D 2EC7FF  18C7FF   5626 TWRLDFCT  ADDI  L7,-1                  DECR FIELD LENGTH
1D3E 201D14  101D14   5627            B     TWR120US              GO LOAD TIMER AND WAIT FOR EOF
                      5628 ************************************************
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       5629 *      THIS ROUTINE WRITES DATA FIELD
                       5630 ********************************************
                       5631 *
1D3F 2E11FE   18D1FE   5632 TWRDATA  ANDI   CEB1,FF-PROCDAT      TURN OFF PROCESS DATA MARK
1D40 2E5203   19D203   5633          ORI    CEB2,ENDDAT         SET TRK ORIENT TO END OF DATA
1D41 271449   1C5449   5634          TIBOF  DLO,MSC2,TWRDLNTO   GO IF DATA LENGTH NOT ZERO
1D42 245144   115144   5635          TIBON  FMTWR,CEB1,TWRZER   GO IF FORMAT WRITE
1D43 201562   101562   5636          B      TRDSPDLO            GO SPACE OVER DATA FIELD
1D44 088520   028520   5637 TWRZER   SABI   INDEXF1,IDXDDCF     CHANGE PGM POINTER TO DDCF
1D45 288720   128720   5638          SABI   INDEXF2,IDXDDCF     ''
1D46 28A63B   12A63B   5639          SADI   DISPFC,D(CSZEROL)   DISP POINTS TO A BYTE OF ZERO
1D47 2A0701   188701   5640          LBI    L7,1                FORCE LENGTH TO 1
1D48 001D4A   001D4A   5641          B      *+2                 SKIP
1D49 28071B   1C871B   5642 TWRDLNTO MV     L7,DCNT             COPY DATA LENGTH
1D4A 27C94C   1F494C   5643          TBOFF  7,GEN1,*+2          GO IF NOT ODD ADDR BOUNDARY
1D4B 2E6F04   19EF04   5644          ORI    SCN,FILEODD         TURN ON FILE ODD XFER
1D4C 269F35   1A5F35   5645          TIBOF  DEFDAT,FFLG,TWRNODEF  GO IF NO DEFECT IN DATA
1D4D 26DD33   1B5D33   5646          TBOFF  3,SDH,TWRCHKSP      GO IF DEFECT IN NEXT DATA FLD -<CD>-
1D4E 0EDDFF   0BDDFF   5647          ADDI   SDH,-1              DECREMENT SD HIGH             -<CD>-
1D4F 201D35   101D35   5648          B      TWRNODEF            NO DEFECT IN NEXT FIELD       -<CD>-
                       5649 ********************************************************
                       5650 *      THIS ROUTINE WRITES THE FIRST SEGMENT OF
                       5651 *          A SPLIT KEY/DATA FIELD
                       5652 ********************************************************
                       5653 *
1D50 0A260F   08A60F   5654 TWRSPKD  LBI    FTO,WRITEOP         SET WRITE OP
1D51 0A06E0   0886E0   5655          LBI    L6,SPFMTG2          SET SPECIAL FMT G2 TAG MODIFIER
1D52 28071E   1C871E   5656 TWRSPFLD MV     L7,SDL              COPY FIRST SEGMENT LENGTH
1D53 0E5204   09D204   5657          ORI    CEB2,X'04'          UPDATE TRACK ORIENTATION
1D54 001D37   001D37   5658          B      TWRRWCOM            GO TO RAISE TAG GATE
                       5659 *
                       5660 ********************************************************
                       5661 *    SUBROUTINE TO FETCH DDDF FROM CHANNEL
                       5662 ********************************************************
                       5663 *         RULES FOR USING THIS SUBROUTINE:
                       5664 *           1.  IF ZERO BYTES ARE TO BE TRANSFERRED, SET L8 '01';
                       5665 *               IF A SINGLE BYTE IS TO BE TRANSFERRED, SET L8='02';
                       5666 *               IF 2-255 BYTES ARE TO BE TRANSFERRED, SET L8='00';
                       5667 *               IF 256 BYTES ARE TO BE TRANSFERRED, SET L8='04'.
                       5668 *               IF EXTENDED CHANNEL OP(WRITE KD), MASK L8 WITH X'03'.
                       5669 *           2.  SET CCH,CCL=(N+1)(KL+DL-2).
                       5670 *
1D55 05C87E   07487E   5671 TWRFDDDF TBON   7,L8,TWRGOTDF        GO IF NO DATA TRANSFER INDICATED
1D56 089E86   029E86   5672          SABI   BLOCKCH,B(DDDFORG+X'8000')  SET BLOCK TO DDDF BUFFER
1D57 28BE7F   128E7F   5673          SADI   DISPCH,D(DDDFORG+127)  SET DISPLACEMENT 2 BYTES AHEAD
1D58 0A3310   088310   5674          LBI    DXC,LSRSELDR        RESET DXC TO SET UP FOR CHAN FETCH
1D59 28D756   13975B   5675          SAI    ZLSCH,ZLSFCHAN      SET ZLS TO STORE TO CS FROM CO2
1D5A 07885C   0E485C   5676          TBOFF  6,L8,*+2            GO IF NOT 1 BYTE TRANSFER
1D5B 0E7301   09F301   5677          ORI    DXC,CHNL1BYT        SET CHANNEL 1 BYTE TRANSFER BIT
1D5C 269462   1A5462   5678          TIBOF  DDDRODD,MSC2,TWRCHNOW  GO IF DDDRODD IS OFF
1D5D 0E7340   09F340   5679          ORI    DXC,CHANODD         SET CHANNEL ODD TRANSFER BIT
1D5E 274862   1D4862   5680          TBOFF  5,L8,TWRCHNOW       GO IF NOT 256 BYTE TRANSFER
1D5F 2E338F   18F38F   5681          ANDI   DXC,FF-CHANODD      RESET CHANNEL ODD TRANSFER
1D60 0E7301   09F301   5682          ORI    DXC,CHNL1BYT        SET FOR 1 BYTE TRANSFER
1D61 0A3100   088100   5683          LBI    CCL,X'00'           1 BYTE XFER(1ST BYTE OF 256)
1D62 04497C   01497C   5684 TWRCHNOW TIBON  FINCHXFR,GEN1,TWROPEN  GO IF THIS IS EXTENDED CHANNEL OP
1D63 0A0739   088739   5685          LBI    L7,D(TIOTWRA1)      SET UP RETURN POINTER AND
1D64 00101E   00101E   5686          B      TIOCHXFR              GO TRANSFER DDDF FROM CHANNEL
1D65 06947E   0A547E   5687 TWRTIOB1 TIBOF  DDDRODD,MSC2,TWRGOTDF  GO IF DDDR ON EVEN BOUNDARY
1D66 07487E   0D487E   5688          TBOFF  5,L8,TWRGOTDF       GO IF NOT 256 BYTE TRANSFER
1D67 28063B   1C863B   5689          MV     L6,CO2              SAVE THE FIRST BYTE
1D68 2E33FD   18F3FD   5690          ANDI   DXC,FF-SUBTRACT     RESET SUBTRACT BIT
1D69 2A3D01   188D01   5691          LBI    B0D,1               LOAD LO DIFFERENCE OF 1
1D6A 0E2340   08E340   5692          ANDI   DST,CHOUTVAL        COPY LO DIFF FROM B0D TO CIO
1D6B 0A3D00   088D00   5693          LBI    B0D,0               HI DIFFERENCE IS 0
1D6C 2E7321   19F321   5694          ORI    DXC,LSRCSR+CHNL1BYT LSR OP AND CHANNEL 1 BYTE TRANSFER
1D6D 2A2100   18A100   5695          LBI    CCH,0               SET CHANNEL
1D6E 0A3100   088100   5696          LBI    CCL,0                 COUNTER TO ZERO
1D6F 2A073B   18873B   5697          LBI    L7,D(TIOTWRA3)      RETURN BRANCH ADDRESS
1D70 00101E   00101E   5698          B      TIOCHXFR            GO DO CHANNEL TRANSFER
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1D71 0A3310   088310   5699 TWRTIOB3 LBI    DXC,LSRSELDR        SET UP DXC TO CONTINUE
1D72 2A2100   18A100   5700          LBI    CCH,X'00'           SET CHANNEL COUNTER FOR 255 BYTE
1D73 2A31FD   1881FD   5701          LBI    CCL,X'FD'             TRANSFER(LAST 255 OF 256)
1D74 088E00   028E00   5702          SADI   DISPCH,D(DDDFORG)   SET DISPLACEMENT TO ORG-2
1D75 0A073A   08873A   5703          LBI    L7,D(TIOTWRA2)      SET UP RETURN POINTER AND
1D76 00101E   00101E   5704          B      TIOCHXFR            GO DO 255 BYTE TRANSFER FROM CHANNEL
1D77 089A06   029A06   5705 TWRTIOB2 SABI   BLOCKB,B(DDDFORG)   SET BASE BLOCK ADDRESS FOR DDDF
1D78 0A0080   088080   5706          LBI    L0,D(DDDFORGR)      SET DISPLACEMENT FOR LAST BYTE XFER
1D79 240086   104086   5707          SINC   L6,L0,0             STORE LAST BYTE IN FIRST POSITION
1D7A 089A05   029A05   5708          SABI   BLOCKB,B(DDCFORG)   SET BASE BLOCK BACK TO DDCF
1D7B 201D7E   101D7E   5709          B      TWRGOTDF            CONTINUE
1D7C 0E7308   09F308   5710 TWROPEN  ORI    DXC,ALOWCHAN        ALLOW DIFFERENCE COUNTER CHANNEL
1D7D 2A2310   18A310   5711          LBI    DST,ALWCHXFR        INITIATE CHANNEL TRANSFER
1D7E 0F90D0   0ED0D0   5712 TWRGOTDF EORU   ZER,ZER             RETURN
                       5713          MBLOK
1D7F 001D7F   001D7F   5714+         B      *                   UNUSED  ::::::::::::
1E00                   5715+         DS     <0>B
                       5716 *
                       5717 ********************************************************************
                       5718 *    SUBROUTINE TO CALCULATE (N+1)(KL+DL) AND SET CCH AND CCL
                       5719 ********************************************************************
                       5720 *         THIS SUBROUTINE DOES THE FOLLOWING:
                       5721 *           1.  SETS L8 TO: '00' IF 1<(N+1)(KL+DL)<256,
                       5722 *                           '01' IF (N+1)(KL+DL)=0,
                       5723 *                           '02' IF (N+1)(KL+DL)=1,
                       5724 *                           '04' IF (N+1)(KL+DL)=256,
                       5725 *                           '08' IF (N+1)(KL+DL)>256.
                       5726 *           2.  SETS L4,L5 AND CCH,CCL=(N+1)(KL+DL-2).
                       5727 *           NOTE: CALLING PROGRAM MUST PROVIDE N IN L6.
                       5728 *                 DATA LENGTH ZERO IS COUNTED AS 1 ON READ OPERATIONS.
                       5729 *
1E00 0A0200   088200   5730 TWRCHCNT LBI    L2,X'00'            INITIALIZE HI COUNT BYTE
1E01 07D403   0F5403   5731          TIBOF  DL256,MSC2,*+2      GO IF DATA LENGTH < 256
1E02 2A0201   188201   5732          LBI    L2,X'01'            SET DATA LENGTH 256
1E03 0B031B   0C831B   5733          MV     L3,DCNT             FETCH LOW DATA COUNT
1E04 258C07   164C07   5734          TBON   6,QBYT,*+3          GO IF WRITE OP
1E05 271407   1C5407   5735          TIBOF  DLO,MSC2,*+2        GO IF NOT DATA LENGTH ZERO
1E06 0A0301   088301   5736          LBI    L3,1                DATA LENGTH IS ZERO, USE 1 FOR CALC
1E07 2B051A   1C851A   5737          MV     L5,KCNT             FETCH KEY COUNT
1E08 2F0305   1CC305   5738          ADD    L3,L5               ADD KEY TO
1E09 0F4210   0DC210   5739          ADDC   L2,ZER                DATA COUNT
1E0A 0B0503   0C8503   5740          MV     L5,L3               MOVE INITIAL KL+DL
1E0B 0B0402   0C8402   5741          MV     L4,L2                 TO ACCUMULATOR REGISTERS
1E0C 0A0800   088800   5742          LBI    L8,X'00'            INITIALIZE MARK REGISTER
1E0D 26C61E   18461E   5743          TBOFF  3,L6,TWRMERGE       IF N IS ZERO,SKIP THE MULTIPLICATION
1E0E 0C86FF   02C6FF   5744          TEORI  L6,255              TEST N FOR 255
1E0F 205E15   111E15   5745          BNZ    TWRWHEW               GO IF IT IS LESS
1E10 07C415   0F4415   5746          TBOFF  7,L4,TWRWHEW        GO IF KL+DL LESS THAN 256
1E11 0A04FF   0884FF   5747          LBI    L4,X'FF'            SET CHANNEL COUNTER
1E12 0A05FE   0885FE   5748          LBI    L5,X'FE'              TO 65,534(MAXIMUM COUNT)
1E13 2A0808   188808   5749          LBI    L8,X'08'                SET COUNT > 256
1E14 201E30   101E30   5750          B      TWRTEN4                 AND EXIT
1E15 2F0701   188701   5751 TWRWHEW  LBI    L7,X'01'            L7 IS MASK FOR MULTIPLICATION
1E16 0D0647   04C647   5752 TWRNKLDL TAND   L6,L7               MASK N
1E17 025E1A   091E1A   5753          BZ     TWRNOADD            SKIP NEXT ADDITION IF THIS BIT IS 0
1E18 2F0503   1CC503   5754          ADD    L5,L3               ADD LO BYTE TO ACCUMULATOR
1E19 0F4402   0DC402   5755          ADDC   L4,L2               ADD HI BYTE TO ACCUMULATOR
1E1A 2F0303   1CC303   5756 TWRNOADD ADD    L3,L3               MULTIPLY THIS KL + DL
1E1B 0F4202   0DC202   5757          ADDC   L2,L2                 BY 2 FOR THE NEXT INCREMENT
1E1C 2F0707   1CC707   5758          ADD    L7,L7               SHIFT MASK TO INSPECT NEXT N BIT
1E1D 029E16   0A1E16   5759          BNC    TWRNKLDL            GO IF MULTIPLICATION CONTINUES
1E1E 24C427   134427   5760 TWRMERGE TBON   3,L4,TWRNZERO       GO IF HI COUNT IS NOT ZERO
1E1F 04C522   034522   5761          TBON   3,L5,*+3            GO IF LO COUNT NOT ZERO
1E20 2A0801   188801   5762          LBI    L8,X'01'            COUNT IS '0000'
1E21 201E30   101E30   5763          B      TWRTEN4             GO SET CHANNEL COUNTER & EXIT
1E22 2C8501   12C501   5764          TEORI  L5,X'01'            TEST LO COUNT FOR 1
1E23 005E2D   011E2D   5765          BNZ    TWRAFTER            GO IF COUNT IS 2-255
1E24 2A0802   188802   5766          LBI    L8,X'02'            COUNT IS '0001'
1E25 2A0500   188500   5767          LBI    L5,X'00'            SET LO CHANNEL COUNT BYTE TO ZERO
1E26 201E30   101E30   5768          B      TWRTEN4             GO SET CHANNEL COUNTER & EXIT
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1E27 0CC4FF  03C4FF  5769 TWRNZERO TADDI L4,X'FF'          SUBTRACT 1 FROM HI COUNT FOR TEST
1E28 205E2C  111E2C  5770          BNZ   TWRM256           GO IF HI COUNT IS NOT '01'
1E29 04C52D  03452D  5771          TBON  3,L5,TWRAFTER     GO IF COUNT IS > 256
1E2A 2A0804  188804  5772          LBI   L8,X'04'          COUNT = 256
1E2B 201E2D  101E2D  5773          B     TWRAFTER          GO SUBTRACT 2, SET CCH,CCL AND EXIT
1E2C 2A0808  188808  5774 TWRM256  LBI   L8,X'08'          COUNT > 256
1E2D 2EC5FE  1BC5FE  5775 TWRAFTER ADDI  L5,X'FE'          SUBTRACT 2 FROM LO COUNT BYTE
1E2E 009E30  021E30  5776          BCY   *+2               GO IF CARRY
1E2F 2EC4FF  1BC4FF  5777          ADDI  L4,X'FF'          SUBTRACT 1 FROM HI COUNT BYTE
1E30 2C2310  10E310  5778 TWRTEN4  TANDI DST,ALWCHXFR      TEST MASK DST
1E31 205E34  111E34  5779          BNZ   *+3               GO IF ALLOW CHAN TRANSFER IS ON
1E32 2B2104  1CA104  5780          MV    CCH,L4            MOVE ADJUSTED HI COUNT TO CCH
1E33 2B3105  1CB105  5781          MV    CCL,L5            MOVE ADJUSTED LO COUNT TO CCL
1E34 0F90D0  0ED0D0  5782          EORU  ZER,ZER           RETURN
                     5783 *
                     5784 *     CHECK CHANNEL COUNTER SUBROUTINE
                     5785 *          AT ENTRY, L2 & L3 HAVE CURRENT HI/LO VALUES AND
                     5786 *          L4 AND L5 CONTAIN INCREMENT FROM ORIGINAL DDDR/DDCR VALUE
                     5787 *
1E35 2A0014  188014  5788 TWRCHKCR LBI   L0,D(DDCRORG)     SET UP DISPLACEMENT OF DDCR IN CS
1E36 001E3B  001E3B  5789          B     TWRCHAN           CONTINUE
1E37 2A0012  188012  5790 TWRCHKDR LBI   L0,D(DDDRORG)     SET UP DISPLACEMENT OF DDDR IN CS
1E38 0EC5FF  0BC5FF  5791          ADDI  L5,FF             SUBTRACT 1 FROM DDDR LO INCR VALUE
1E39 209E3B  121E3B  5792          BCY   *+2               GO IF OK
1E3A 2EC4FF  1BC4FF  5793          ADDI  L4,FF             SUBTRACT 1 FROM DDDR HI INCR VALUE
1E3B 2440C6  1140C6  5794 TWRCHAN  LINC  L6,L0,1           FETCH INITIAL DDDR/DDCR HI
1E3C 2400C7  1040C7  5795          LINC  L7,L0,0           FETCH INITIAL DDDR/DDCR LO
1E3D 0F07C5  0CC705  5796          ADD   L7,L5             ADD INCREMENT TO INITIAL LO VALUE
1E3E 2F4604  1DC604  5797          ADDC  L6,L4             ADD INCREMENT TO INITIAL HI W/CARRY
1E3F 2D8246  16C246  5798          TEOR  L2,L6             COMPARE INITIAL AND FINAL HI VALUES
1E40 225E48  191E48  5799          BZ    TWRCHKLO          IF EQUAL, GO TO CHECK LO VALUES
1E41 261343  185343  5800 TWRL824  TIBOF RDSNS,MSC1,*+2    GO IF NOT READ DIAG SNS CMD
1E42 001028  001028  5801          B     TIOADCHK          GO FORCE ADAPTER CHECK
1E43 0A0824  088824  5802          LBI   L8,X'24'          POST ERROR - CHAN COUNTER CHECK
1E44 2B0435  1C8435  5803 TWRFMT2E MV    L4,FTI            SAVE FTI
1E45 0B002B  0C802B  5804          MV    L0,HES            SAVE HES
1E46 0B0129  0C8129  5805          MV    L1,ADS            SAVE ADS
1E47 200708  100708  5806          B     TEFL703           GO POST EQUIPMENT CHECK
1E48 2D8347  16C347  5807 TWRCHKLO TEOR  L3,L7             COMPARE INITIAL AND FINAL LO VALUES
1E49 005E41  011E41  5808          BNZ   TWRL824           CHANNEL COUNTER CHECK IF UNEQUAL
1E4A 0F90D0  0ED0D0  5809          EORU  ZER,ZER           RETURN
                     5810 ********************************************************      -<CD>-
                     5811 *  ENTRY FOR WRITE COMPRESSED COUNT-DATA                       -<CD>-
                     5812 ********************************************************      -<CD>-
                     5813 *                                                              -<CD>-
1E4B 2018F0  101BF0  5814 TWRWCCD  BU    TWREVNHD          SET EVEN HEAD
1E4C 24914E  12514E  5815          TIBON WRENABLE,CEB1,*+2 GO IF WRITE ENABLED          -<CD>-
1E4D 201C32  101C32  5816          B     TWRL800           GO POST CMD REJECT           -<CD>-
1E4E 04DA51  035A51  5817          TBON  3,KCNT,TWRINVCF   GO IF KL NOT ZERO            -<CD>-
1E4F 259451  165451  5818          TIBON KDGT256,MSC2,TWRINVCF  GO IF KL+DL > 256       -<CD>-
1E50 05D452  075452  5819          TIBON DL256,MSC2,*+2    GO IF DL EQUAL 256           -<CD>-
1E51 201818  101818  5820 TWRINVCF B     TSKINVSK          POST CMD REJECT-INVALID ARGU -<CD>-
1E52 059951  065951  5821          TBON  6,REC,TWRINVCF    GO IF (R-1)/4                -<CD>-
1E53 07D951  0F5951  5822          TBOFF 7,REC,TWRINVCF      IS NOT AN INTEGER          -<CD>-
1E54 279C51  1E5C51  5823          TBOFF 6,NREC,TWRINVCF   GO IF (N+1)/4                -<CD>-
1E55 07DC51  0F5C51  5824          TBOFF 7,NREC,TWRINVCF     IS NOT AN INTEGER          -<CD>-
1E56 2B0610  1C8610  5825          MV    L6,ZER            INIT L6 FOR CHAN CNTR SET UP -<CD>-
1E57 200780  100780  5826          BU    TEFSETRW          GO SET READ/WRITE            -<CD>-
1E58 001E80  001E80  5827          BU    TWRCHCNT          GO SET UP CHANNEL COUNTER    -<CD>-
1E59 0B0208  0C8208  5828          MV    L2,L8             COPY L8 TO L2 FOR DDDF FETCH -<CD>-
1E5A 001DD5  001DD5  5829          BU    TWRFDDDF          GO FETCH DDDF                -<CD>-
1E5B 2A086D  18886D  5830          LBI   L8,D(TWRTWRB3)    SET UP RETURN FOR SUBR       -<CD>-
                     5831 ********************************************************************
                     5832 *  SUBROUTINE TO CHECK AND RESTORE DDDR IF NOT EXTENDED CHANNEL OP
                     5833 ********************************************************************
                     5834 *
                     5835 *      L8 MUST CONTAIN DISPLACEMENT FOR RETURN BRANCH
                     5836 *
1E5C 25C25E  17425E  5837 TWRCHEDR TBON  7,L2,TWRL51       GO IF ZERO LENGTH TRANSFER
1E5D 078260  0E4260  5838          TBOFF 6,L2,TWRZP2       GO IF > 1 BYTE TRANSFER
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

1E5E 0A0501  088501  5839 TWRL51  LBI   L5,X'01'          SET COUNT FOR 1 BYTE XFER CHECK
1E5F 001E62  001E62  5840          B     TWRZDF            PROCEED
1E60 2EC502  1BC502  5841 TWRZP2  ADDI  L5,2               ADD 2 TO CHANNEL COUNT
1E61 0F4410  0DC410  5842          ADDC  L4,ZER              TO GET ACTUAL BYTE COUNT FOR CHK
1E62 0011CB  0011CB  5843 TWRZDF  BU    TIORDDDR          FETCH CURRENT DDDR VALUE
1E63 201EB7  101EB7  5844          BU    TWRCHKDR          GO CHECK THE CHANNEL COUNTER
1E64 283D05  1C3D05  5845          MV    BOO,L5            MOVE LOW DIFFERENCE TO CHNL BUFFER
1E65 0E2340  0BE340  5846          ANDI  DST,CHOUTVAL      XFER BOO TO CIO
1E66 0B3D04  0C3D04  5847          MV    BOO,L4            MOVE HI DIFFERENCE TO BUFFER
1E67 0E7302  09F302  5848          ORI   DXC,SUBTRACT      TURN ON SUBTRACT
1E68 0011CD  0C11CD  5849          BU    TIOUDDDR          GO RESTORE DDDR TO ORIGINAL VALUE
1E69 211E08  141E08  5850          BR    B(*),L8           RETURN BRANCH
1E6A 001C11  001C11  5851 TWRTWRA1 B     TWRTWRB1          RETURN TO CALLING ROUTINE
1E6B 201C3E  101C3E  5852 TWRTWRA2 B     TWRTWRB2          RETURN TO CALLING ROUTINE
1E6C 00160A  00160A  5853 TWRTSCA1 B     TSCTWRB1          RETURN TO CALLING ROUTINE
                     5854 *
1E6D 2E5504  19D504  5855 TWRTWRB3 ORI   FLAG,CMPDAT       TURN ON COMPRESS DATA FLAG BIT-<CD>-
1E6E 2014D4  1014D4  5856          BU    TRDRWEND          GO WAIT FOR END READ/WRITE    -<CD>-
1E6F 0E5220  09D220  5857          ORI   CEB2,WRITE        TURN ON WRITE MARK            -<CD>-
1E70 28D2CE  1392CE  5858          SZI   ZLSFD,ZLSWFILE    SET ZLS TO WRITE TO FILE      -<CD>-
1E71 2E5147  19D147  5859          ORI   CEB1,FMTWR+PROCNT+PROCKEY+PROCDAT  SET XEQ MARKS -<CD>-
1E72 0E4920  09C920  5860          ORI   GEN1,FIXDDCF      SET END PROCEDURE MARKS       -<CD>-
1E73 2E5320  19D320  5861          ORI   MSC1,MUREC        SET MULTIPLE RECORD MARK      -<CD>-
1E74 2ED9FF  1BD9FF  5862          ADDI  REC,-1            DECR REC FOR TRK ORIENTATION  -<CD>-
1E75 0E5240  09D240  5863          ORI   CEB2,ENDHA+SRCH   SET SRCH AND END OF HA MKS    -<CD>-
1E76 201C4A  101C4A  5864          B     TWRRDG1           GO ORIENT ON EVEN INDEX       -<CD>-
                     5865          MBLOK
1E77 201E77  101E77  5866+         B     *                 UNUSED  ::::::::::::
1E78 201E78  101E78  5867+         B     *                 UNUSED  ::::::::::::
1E79 001E79  001E79  5868+         B     *                 UNUSED  ::::::::::::
1E7A 001E7A  001E7A  5869+         B     *                 UNUSED  ::::::::::::
1E7B 201E7B  101E7B  5870+         B     *                 UNUSED  ::::::::::::
1E7C 001E7C  001E7C  5871+         B     *                 UNUSED  ::::::::::::
1E7D 201E7D  101E7D  5872+         B     *                 UNUSED  ::::::::::::
1E7E 201E7E  101E7E  5873+         B     *                 UNUSED  ::::::::::::
1E7F 001E7F  001E7F  5874+         B     *                 UNUSED  ::::::::::::
1F00                 5875+         DS    <0>B
                     5876          END COPY-MEMBER TWR12
      92BE5F4E       5877    END
```

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
ACTRACK	0001	0900		
ACTRK	0001	0893		
ADAPTCHK	0008	0981		
ADS	0029	0709		1339 5805
ADTCKRST	0080	0943		5315 5316
ALLOWFBI	0001	0920		
ALLOWIDX	0001	0949		1788 1789 1838 1842 3044 3053 3354 4219 5494
ALOWCHAN	0008	0971		2835 5710
ALOWFILE	0004	0972		1868 2085 3041 4240 4325 4377 5611
ALOWSKCE	0040	1084		4806
ALOW12	0080	1083		1305 3455 3819
ALTTRK	0001	1078		1947
ALWCHXFR	0010	0928		2836 3516 5711 5778
ALWFXFR	0008	0936		1331 2091 2159 2876 2969 3045 4944
ALWRTHA	0008	1086		5446
AMSRCH	0080	0862		
ATTN	0004	0886		1263 3360 3415
BLOCKB	001A	1112		1188 1550 1562 2752 2760 3239 3310 3321 3324 3609 3611 4054 4059 4416 4421 4427 4461 4521 4759 4761 4765 4998 5006 5152 5154 5207 5254 5256 5274 5288 5303 5705 5708
BLOCKCH	001E	1106		1189 2822 2847 2965 3228 3266 3503 5672
BLOCKE	0016	1113		1194
BLOCKFC	0006	1108		1190
BLOCKFD	000A	1110		1192
BOO	003D	072B		2541 2543 2646 2648 3234 3236 3313 3315 3618 3620 3714 3722 4517 4519 5691 5693 5845 5847
BUSY	0002	0887		
BYTEREAD	0516	1987		2784 4337 5218
CCH	0021	0724		2626 2718 2769 2852 3226 3264 3509 3727 4061 4156 4440 4767 5695 5700 5780
CCL	0031	0725		2627 2665 2683 2696 2720 2768 3227 3265 3510 3728 4062 4155 4439 4768 5683 5696 5701 5781
CEALERT	0010	0869		
CEB1	0011	0752		1397 1569 1790 1841 1928 1932 1934 2182 2189 2190 2205 2222 2224 2236 2237 2281 2296 2306 2309 2311 2312 2313 2339 2341 2359 2376 2497 2607 2608 2623 2680 2681 2738 2739 2824 2908 2912 3450 4070 4123 4133 4160 4179 4182 4197 4209 4248 4316 4354 4532 4539 4547 4977 5248 5417 5433 5468 5488 5501 5504 5546 5557 5571 5596 5632 5635 5815 5859
CEB2	0012	0753		1398 1600 1618 1621 1622 1843 1844 1875 1881 1893 1896 1897 1898 1925 1948 2087 2088 2117 2160 2178 2180 2188 2221 2223 2228 2232 2244 2256 2257 2272 2283 2289 2294 2297 2298 2305 2323 2360 2372 2377 2393 2618 2685 2687 2761 2884 2899 2901 2902 2904 2914 2925 2931 2932 2939 3629 3641 3655 3682 3685 3692 3697 3703 3769 4101 4190 4183 4198 4202 4203 4211 4245 4249 4318 4319 4333 4355 4371 4373 4394 4398 4541 4542 4549 4734 5432 5437 5454 5483 5492 5559 5566 5576 5588 5598 5599 5633 5657 5857 5863
CHANODD	0040	0968		2831 2850 3507 5679 5681
CHANXCHK	0010	0980		
CHI	0016	0757		1828 2191 2447 3152 3157 4095 4582 4833 4835 4837 4839 4845 4845 4851 4854
CHKEND	0020	0868		1900 1918 2098 2130 2143
CHKRESET	0040	0954		
CHKRST	000C	0848		1269 5310
CHNL1BYT	0001	0974		2829 3726 5677 5682 5694
CHOUTVAL	0040	0925		2542 2647 3235 3314 3619 3715 3723 3733 3757 4518 5692 5846
CICHECK	0040	0979		
CLKG2	0020	0820		4382 5589
CLKG3	0010	0819		5587
CLO	0017	0758		1439 1440 1440 1445 1450 1451 1827 1959 2192 2444 3151 3155 3357 3398 3400 4092 4584 4813 4814 4817 4834 4834 4836 4842 4844 4844 4850 4855
CMDOVN	0080	0904		1903 2880
CMPDAT	0004	1076		1570 1571 1619 1620 1672 2247 2314 2342 2417 4171 4186 5855
CNTCNTR	0524	1999		1849 4199 4250
CONTROL	008F	0807		1266 3446 3605 3859 3936 4702 4739 4987 5136 5179 5308
CO2	0038	0711		3732 3734 3756 3758 5689
CSOVRUN	0080	0978		1912 2156
CSTEMP1	0589	2024		
CSZEROL	053B	2006		5639
CSZEROR	05BB	2029		
CTLRCHK	0080	0881		
CTLRERR1	0002	0814		3094 5176

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
CTLRERR2	0001	0815		5171
CTROFLD1	0008	1012		
CTROFLD2	0004	1013		
CTROFLD3	0002	1014		
CTROFLD4	0001	1015		
DATACHAN	0080	0967		2826
DATACHK	0010	0906		2893 2921
DATAEND	0002	0909		2923
DATAOVN	0040	0905		1901 2888
DCNT	001B	0762		1519 1666 1708 2388 2420 2425 2429 2432 2434 2465 2609 3109 3565 3577 3579 4357 4358 4562 4587 5642 5733
DDCFORG	0500	1977		1188 1189 1190 1194 1874 3310 3321 3324 5574 5708
DDCFORGL	0500	1978		1191 1385 2658 2688 2697 2760 2847 2848 3153 3160 3503 3504 3549 3559 4217 4414 4416 4419 4421 4427 4521 4581 5380 5396 5524
DDCFORGR	0580	2020		2512 2660 2689 3154 3550 3560 3569 4218 4423 4580 5381 5463 5525
DDCRODD	0040	1064		2663 2699 2849 3506 3553
DDCRORG	0514	1986		5788
DDDFORG	0600	2046		1192 1193 1387 2047 2752 2753 2754 2756 2757 2822 2823 2825 4264 4461 4560 4761 5603 5672 5673 5702 5705
DDDFORGR	0680	2047		5706
DDDRODD	0020	1065		2722 2755 2830 3492 4045 4052 4148 4265 4466 4557 5250 5605 5678 5687
DDDRORG	0512	1985		2595 3494 4046 5790
DDODD	0001	0963		3491 3505 4044
DEFCNT	0080	1073		1695 1770 4241 5560 5583
DEFDAT	0020	1075		1686 1695 1757 4361 4399 4563 5645
DEFKEY	0040	1074		1685 1688 1694 1706 4329 4374 5615
DEFTRK	0002	1077		1940 2177 2279
DIAGSET	008A	0804		
DIFFZERO	0040	0926		2574 2584
DIFF256	0040	0842		
DISPCEHI	000C	0799		
DISPCELO	000D	0800		
DISPCH	001E	1107		2823 2825 2848 2966 3229 3267 3504 4560 5673 5702
DISPFC	0006	1109		1191 1385 1874 5574 5639
DISPFD	000A	1111		1193 1387 4264 5603
DLO	0008	1066		1520 2089 2416 3578 4356 4550 5634 5735
DL256	0001	1069		1668 1707 2416 2418 2611 3575 4172 4588 5731 5819
DMATTN	0020	0945		1392 3604 3857 4081
DRVCHK	0020	0883		
DSDISP1	0508	1980		1550 1551 1562 1673
DSDISP2	050A	1981		
DSDISP3	050C	1982		
DST	0023	0720		1221 1332 1372 1374 1391 2510 2542 2574 2581 2584 2587 2593 2647 2836 2845 3163 3164 3235 3314 3327 3516 3517 3536 3619 3715 3723 3733 3757 3807 3875 3911 3913 3927 3967 3971 4015 4017 4022 4069 4072 4083 4518 5272 5692 5711 5778 5846
DSYNCIN	0002	0919		3016
DUMMY	0000	0877		2084 4297
DXC	0033	0715		1227 1394 1868 2085 2624 2625 2645 2826 2829 2831 2835 2846 2850 2968 3041 3231 3237 3269 3316 3502 3507 3621 3716 3717 3724 3725 3726 3730 4073 4216 4240 4325 4377 4503 4516 5277 5611 5674 5677 5679 5681 5682 5690 5694 5699 5710 5848
D1CURPA	0554	2009		
D1OLDPA	0556	2010		
D1RDCNTR	0558	2011		
D1SENSE	053C	2008		3345 3998
D1SKCNTR	055C	2012		
D2CURPA	0576	2015		
D2OLDPA	0578	2016		
D2RDCNTR	057A	2017		
D2SENSE	055E	2014		4000
D2SKCNTR	057E	2018		
D3CURPA	05D4	2032		
D3OLDPA	05D6	2033		
D3RDCNTR	05D8	2034		
D3SENSE	05BC	2031		
D3SKCNTR	05DC	2035		
D4CURPA	05F6	2038		

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
D4OLDPA	05F8	2039		
D4RDCNTR	05FA	2040		
D4SENSE	05DE	2037		
D4SKCNTR	05FE	2041		
ECCCNTL	0008	0796		3048
ECCHI	0040	0812		3102
ECCLOW	0080	0811		3099
EFSENSEL	053A	2003		1307 3460 3600 3853 4049 4075
EFSENSER	05BA	2027		
ENDCHXFR	0020	0927		2581 3163 3517
ENDCNT	0004	1047		4203 5437
ENDDAT	0003	1046		4355 4398 4549 5633
ENDDAT1	0007	1049		
ENDFILEX	0001	0959		1867 1910 1911 2127 2129 2131 2155 2936 2984 3010 3043 3057 3065 3083
ENDHA	0000	1043		5863
ENDKEY	0002	1045		4319 4373 4542 5599
ENDKEY1	0006	1048		
ENDROCNT	0001	1044		
ENDTRAP	0008	0956		1908 2151
ERASE	0002	1058		2218 2226 2327 2371 5568
ERRALERT	0001	0873		
ERRMODE	0020	0955		1393 3258 3259 3318 3634
ERRRETUN	0080	1019		3883 5320
ERRTRAP	0008	0947		1382 1392
EXTARCHK	0001	0993		
FBI	0022	0710		1255 1470 1858 1891 2084 2878 3076 3096 3101 3104 3357 3360 3402 3412 3415 3416 3419 3444 3449 3451 3452 3456 3459 3832 3838 3839 3858 3863 3874 3905 3906 4297 4305 4653 4671 4672 4691 4697 4701 4742 4951 4990 5050 5135 5139 5142 5145 5148 5168 5173 5178 5182 5185 5498
FBICHK	0002	0992		
FBO	002E	0721		1236 1242 1244 1258 1267 1269 1272 1275 1483 1487 1861 1862 1870 2081 3047 3094 3099 3102 3362 3441 3447 3606 3794 3827 3860 3937 4206 4213 4244 4246 4283 4300 4302 4308 4380 4381 4382 4607 4613 4644 4647 4651 4656 4658 4703 4740 4950 4988 5137 5140 5143 5146 5171 5176 5180 5183 5307 5310 5312 5405 5530 5537 5565 5567 5569 5587 5589 5620 5621 5622
FBOCHK	0008	0990		
FCT	0036	0723		2092 2970 3049
FEB	0E01	3202		3203 3204 3228 3239 3266 3267
FEBADD1	0080	3205		3214
FEBADD2	0000	3206		3212
FEBJUNK	0E00	3201		3229
FEBL	0E01	3203		3240 3260 3280
FEBR	0E81	3204		3241 3261 3284
FF	00FF	1082		1225 1249 1277 1278 1309 1331 1343 1393 1471 1496 1788 1790 1798 1831 1838 1841 1854 1868 1927 2066 2074 2159 2205 2254 2313 2329 2350 2359 2390 2401 2409 2416 2426 2508 2516 2598 2599 2634 2635 2639 2640 2654 2676 2712 2722 2876 2916 2918 3041 3044 3050 3069 3092 3114 3115 3127 3217 3218 3244 3246 3250 3252 3275 3413 3481 3482 3594 3621 3629 3641 3655 3682 3685 3692 3697 3703 3716 3769 3771 3791 3847 3864 3865 3988 3989 4012 4023 4078 4081 4084 4152 4183 4216 4240 4316 4340 4354 4377 4392 4503 4539 4547 4556 4606 4619 4706 4718 4827 4907 4944 5038 5316 5324 5340 5361 5493 5533 5557 5596 5604 5632 5681 5690 5791 5793
FFLG	001F	0766		1489 1542 1547 1549 1571 1592 1619 1620 1624 1663 1672 1685 1688 1694 1695 1706 1722 1757 1770 1940 1947 2123 2177 2200 2247 2279 2314 2394 2417 2440 4088 4241 4329 4361 4374 4399 4563 5511 5512 5543 5544 5560 5562 5583 5585 5615 5645
FHF	0027	0719		1225 1309 1333 1393 1867 1908 1910 1911 1915 2127 2129 2131 2151 2155 2331 2332 2715 2936 2979 2984 2988 2989 2992 2998 3004 3005 3010 3043 3057 3065 3083 3258 3259 3318 3634 3772 5273
FILEODD	0004	0937		1331 2159 2397 4266 4323 4360 4558 5607 5610 5644
FILEXCHK	0010	0989		
FINCHXFR	0040	0998		2507 2508 2832 4144 5414 5684
FIXDDCF	0020	0999		2653 2654 4134 4163 4530 5434 5489 5860
FI1	002A	0729		
FLAG	0015	0756		1570 2342 2441 2862 2863 2864 3561 4089 4171 4186 5452 5473 5511 5513 5517 5521 5855
FMTERASE	0070	0834		5569
FMTG1	0040	0831		5530

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
FMTG2	0060	0833		5567
FMTG3	0050	0832		5565
FMTWR	0040	1029		1569 2182 2190 2222 2309 2312 4179 5488 5504 5635 5859
FORCERST	0020	1085		3822
FORCERYC	0020	0916		3052 3069 3092
FORWARD	0080	0841		
FOTOFI	0004	0918		1343 2973
FTG	0025	0716		1233 1237 1238 1249 1277 1343 1389 1390 1488 1496 2057 2066 2082 2083 2408 2409 2973 2974 2975 2982 2995 2996 3011 3016 3052 3069 3088 3089 3092 3791 3792 3864 3989 4023 4032 4230 4231 4285 4286 4290 4295 4296 4310 4939 5340 5623
FTI	0035	0707		1337 1492 1498 1782 1839 1889 2059 2094 2095 2097 2098 2101 2103 2128 2130 2132 2141 2142 2143 3055 3056 3066 3355 4229 4293 4294 5803
FTO	0026	0722		1199 1200 1205 1239 1241 1245 1247 1253 1256 1259 1266 1274 1468 1482 1486 1575 1617 1856 1863 1869 1894 2056 2079 2116 2171 2217 2374 2398 2882 2892 3048 3093 3358 3440 3446 3605 3612 3793 3828 3859 3936 4215 4243 4282 4298 4299 4301 4379 4645 4648 4650 4659 4669 4689 4702 4739 4952 4987 5133 5136 5166 5170 5175 5179 5308 5313 5404 5496 5548 5564 5619 5654
FTOCHK	0004	0991		
FTR	002D	0717		1224 1234 1235 1288 1289 1352 1382 1392 1467 1471 1788 1792 1838 1842 3044 3053 3354 3410 3413 3464 3604 3857 4081 4219 5315 5316 5494
GEN1	0009	0742		1396 1798 2254 2396 2507 2508 2566 2621 2622 2653 2654 2674 2676 2711 2712 2783 2832 2916 2918 3493 3770 3806 3908 3962 3988 4012 4124 4134 4144 4163 4178 4196 4205 4210 4232 4322 4359 4525 4530 4556 4559 5187 5324 5414 5434 5489 5604 5606 5609 5625 5643 5684 5860
HEAD	0018	0759		1441 1442 1447 1448 1449 1452 1823 1824 1826 1860 1955 1958 2193 2450 3148 3150 3156 3159 3161 3355 3396 4098 4585 4822 4825 4827 4828 4836 4838 4846 4848 4853 4856 5392 5395 5399
HES	002B	0708		1338 1912 2156 3534 5804
IDXDDCF	0020	1134		1383 1384 1871 1872 5572 5573 5637 5638
IDXDDDF	0040	1135		4262 4263 4320 4321 4553 4554 5600 5601
IDXMK	0002	0892		
IDXP1	0004	1057		1831 1854 1855 1886
IDXP2	0008	1056		1831 1851 1854 1883
INDEX	0002	0872		1782 2095 2101 2128 2142 3055
INDEXB	0001	1091		1177 3825
INDEXCH	0003	1092		1178
INDEXE1	0009	1095		1181
INDEXE2	000B	1096		1182
INDEXE3	000D	1097		1183
INDEXE4	000F	1098		1184
INDEXF1	0005	1093		1179 1383 1871 4262 4320 4553 5572 5600 5637
INDEXF2	0007	1094		1180 1384 1872 4263 4321 4554 5573 5601 5638
INDEXIT	001F	1099		1295 1298 1353 1357
INFCHK	0040	0882		
INTREQD1	0080	1008		
INTREQD2	0040	1009		
INTREQD3	0020	1010		
INTREQD4	0010	1011		
INVPRTY	0002	0948		
IOATTN	0040	0944		1467 1471 3410 3413
IOCONB	0010	0946		
IOPBUSY	0080	0924		1374 3327 3807 3875 3911 3913 3967 3971 4017 4069 4083
KCNT	001A	0761		1522 1527 1546 1548 1665 1686 1699 1710 2385 2419 2424 2429 2432 2463 2613 2740 2741 2742 3563 3580 4327 4328 4543 4586 5613 5614 5737 5817
KDGT256	0002	1068		2800 3584 3587 4141 4170 4346 5418 5472 5818
LASTREC	0010	0935		2090
LOSTORT	0020	0897		
LSRCSR	0020	0969		3725 4216 5694
LSRSELDR	0010	0970		2826 3231 3716 3724 5674 5699
LO	0000	0733		0877 1171 1172 1173 1174 1175 1201 1250 1258 1278 1282 1338 1402 1403 1451 1452 1551 1552 1561 1576 1578 1661 1663 1665 1666 1720 1722 2112 2119 2123 2192 2193 2273 2321 2357 2421 2422 2423 2424 2425 2435 2443 2449 2460 2462 2544 2545 2658 2688 2690 2692 2693 2694 2697 2717 2719 2721 2753 2756 2784 2785 2786 2787 2788 2789 2790 2862 2864 3110 3127 3129 3131 3133 3139 3153 3155 3156 3160 3161 3171 3281 3296 3299 3302 3305 3305 3306 3328 3347 3453 3454 3494 3495 3496 3499 3500 3549 3551 3559 3561 3563 3565 3601 3602 3603 3746 3794 3809 3865 3990 4046 4047 4048 4086 4091 4097 4152 4153 4154 4176

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
				4177 4199 4200 4217 4250 4251 4257 4259 4269 4369 4370 4388 4390 4405 4414
				4417 4419 4422 4425 4469 4484 4490 4493 4495 4497 4498 4511 4512 4522 4523
				4524 4581 4584 4585 4586 4587 4692 4742 4743 4744 4755 4757 4758 4762 4797
				4798 4855 4856 4881 4882 4913 4914 4945 4990 4991 4992 4993 4994 5003 5005
				5015 5016 5017 5052 5053 5158 5159 5160 5161 5218 5219 5220 5244 5251 5255
				5258 5259 5327 5328 5347 5348 5349 5361 5363 5376 5377 5380 5396 5397 5401
				5463 5464 5465 5507 5508 5509 5524 5526 5528 5544 5706 5707 5788 5790 5794
				5795 5804
L1	0001	0734		1202 1251 1279 1279 1283 1339 1368 1415 1465 1577 1662 1664 1669 1721 2113
				2121 2191 2267 2268 2269 2274 2315 2316 2330 2355 2356 2422 2426 2431 2446
				2452 2461 2512 2513 2595 2596 2597 2660 2661 2662 2689 2691 2719 2720 2754
				2757 2790 2791 2792 2793 2794 2795 2803 2804 2805 2806 3111 3130 3132 3140
				3154 3157 3173 3285 3288 3290 3294 3298 3299 3454 3455 3550 3552 3560 3562
				3564 3566 3569 3570 3747 3810 3830 3833 3836 3846 3855 3866 3866 3872 3878
				3884 3903 3907 3921 3925 3934 3960 3999 4006 4019 4087 4094 4218 4270 4389
				4391 4423 4424 4426 4462 4474 4485 4580 4582 4583 4590 4592 4688 4693 4699
				4791 4792 4854 4880 4912 4946 5329 5331 5333 5333 5334 5348 5354 5355 5357
				5360 5360 5362 5371 5374 5376 5381 5525 5527 5529 5805
L2	0002	0735		1203 1212 1217 1271 1281 1285 1293 1372 1422 1516 1524 1528 1530 1531 1552
				1555 1560 1573 1574 1601 1602 1605 1606 1607 1673 1674 1675 1687 1689 1690
				1839 1895 1899 1900 1918 2114 2169 2547 2601 2792 2799 2802 2806 2807 2809
				2948 3107 3108 3110 3113 3115 3117 3120 3213 3214 3218 3220 3221 3242 3244
				3248 3250 3254 3282 3292 3295 3302 3378 3387 3391 3423 3425 3429 3437 3482
				3483 3495 3499 3594 3595 3596 3610 3734 3748 3749 3782 3784 3784 3785 3846
				3847 3848 3851 3907 3909 3915 3925 3927 3930 3959 3973 4015 4019 4022 4047
				4337 4338 4339 4347 4348 4445 4463 4501 4509 4514 4517 4683 4791 4793 4797
				4799 4801 4815 4818 4820 4820 4821 4821 4822 4823 4823 4824 4824 4825 4826
				4884 4886 4889 4891 4894 4907 4908 4913 4982 4985 5009 5013 5028 5028 5036
				5038 5040 5042 5159 5163 5204 5242 5246 5252 5334 5349 5358 5375 5377 5397
				5398 5400 5401 5425 5477 5533 5535 5730 5732 5739 5741 5755 5757 5757 5798
				5828 5837 5838
L3	0003	0736		1204 1368 1439 1443 1444 1445 1465 1523 1526 1527 1529 1532 1556 1559 1576
				1582 1588 1712 1714 1891 1901 1903 1904 1919 2160 2161 2162 2163 2549 2600
				2793 2798 2801 2805 2878 2880 2888 2893 2895 2896 2903 2921 2923 3109 3111
				3112 3114 3116 3119 3212 3217 3219 3222 3243 3246 3249 3252 3256 3280 3281
				3282 3283 3284 3285 3286 3372 3404 3407 3444 3462 3481 3485 3486 3487 3491
				3496 3500 3505 3564 3572 3574 3581 3582 3585 3602 3732 3749 3785 3921 3986
				4006 4044 4048 4078 4079 4338 4342 4344 4347 4699 4710 4792 4794 4798 4807
				4809 4811 4826 4829 4831 4832 4832 4838 4840 4843 4882 4901 4903 4905 5245
				5249 5254 5350 5351 5353 5354 5373 5374 5539 5541 5733 5736 5738 5740 5754
				5756 5756 5807
L4	0004	0737		1335 1336 1337 1345 1413 1414 1415 1416 1422 1423 1424 1517 1518 1530 1533
				1539 1540 1543 1545 1553 1561 1577 1579 1584 1587 1589 1591 1597 1599 1606
				1609 1628 1630 1786 1885 1946 1949 1950 1953 1956 2062 2093 2107 2119 2172
				2174 2514 2515 2516 2517 2519 2528 2539 2545 2547 2567 2610 2612 2614 2630
				2634 2637 2725 2731 2734 2766 2769 2775 2794 2797 2804 2883 3097 3104 3105
				3122 3123 3124 3138 3141 3221 3274 3275 3277 3283 3315 3349 3350 3395 3399
				3417 3443 3579 3580 3586 3742 3755 3766 3767 3813 3814 3815 3820 3821 3822
				3834 3835 3836 3837 3877 3878 3902 3903 3909 3910 3912 3929 3930 3931 3933
				3934 3935 3958 3959 3960 3961 3985 3986 4050 4055 4063 4154 4156 4220 4251
				4252 4254 4255 4257 4259 4291 4300 4305 4308 4339 4343 4348 4446 4456 4510
				4512 4513 4513 4514 4515 4623 4626 4630 4632 4634 4639 4642 4661 4662 4675
				4677 4680 4681 4684 4709 4710 4711 4729 4730 4731 4760 4769 4880 4885 4888
				4947 5132 5191 5194 5195 5196 5197 5199 5200 5291 5577 5741 5746 5747 5755
				5760 5769 5777 5780 5793 5797 5803 5842 5847
L5	0005	0738		1519 1521 1529 1534 1536 1538 1541 1544 1546 1554 1578 1579 1581 1583 1586
				1588 1590 1596 1598 1607 1608 1746 1756 1759 1763 1808 1810 2121 2173 2174
				2440 2441 2442 2445 2448 2451 2454 2460 2463 2467 2468 2520 2525 2527 2541
				2544 2549 2568 2609 2613 2616 2635 2636 2667 2682 2695 2726 2729 2732 2740
				2745 2747 2767 2768 2772 2774 2795 2796 2803 3101 3105 3124 3125 3142 3222
				3273 3276 3304 3307 3309 3313 3461 3462 3555 3743 3817 3818 3821 3888 3889
				4051 4053 4055 4056 4057 4058 4064 4088 4089 4090 4093 4096 4099 4149 4151
				4153 4155 4405 4406 4447 4457 4464 4479 4507 4515 4523 4589 4590 4608 4611
				4621 4629 4631 4635 4638 4647 4653 4656 4678 4679 4685 4754 4763 4770 4881
				4892 4895 4897 4897 4898 4899 4899 4900 4948 5025 5030 5031 5034 5036 5041
				5043 5045 5046 5046 5047 5047 5049 5737 5738 5740 5748 5754 5761 5764 5767
				5771 5775 5781 5791 5796 5839 5841 5845
L6	0006	0739		1316 1403 1404 1405 1406 1543 1558 1560 1573 1591 1601 1609 1612 1639 1674

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
				1677 1682 1689 1692 1703 1742 1748 1807 1809 1812 2262 2268 2270 2293 2316
				2317 2318 2319 2320 2385 2388 2391 2392 2400 2443 2444 2445 2446 2447 2448
				2449 2450 2451 2452 2453 2454 2461 2464 2466 2467 2513 2517 2596 2598 2601
				2630 2637 2639 2642 2648 2731 2749 2785 2797 2947 2948 2949 3046 3067 3117
				3129 3133 3134 3136 3211 3216 3225 3272 3276 3316 3365 3378 3387 3391 3392
				3436 3437 3483 3484 3596 3597 3600 3601 3603 3744 3818 3819 3820 3841 3843
				3850 3851 3852 3854 3855 3856 3889 3890 3891 3892 3998 4000 4076 4079 4082
				4091 4092 4093 4094 4095 4096 4097 4098 4099 4140 4331 4336 4391 4392 4396
				4403 4409 4471 4484 4486 4498 4499 4500 4506 4609 4612 4622 4625 4636 4640
				4641 4643 4644 4730 4731 4735 4736 4737 4738 4744 4760 4762 4883 4887 4890
				4898 4900 4902 4904 4906 4909 4911 4914 4956 4963 4966 4970 4972 4974 4983
				4986 5010 5014 5025 5026 5027 5032 5033 5034 5039 5048 5049 5051 5053 5161
				5164 5203 5204 5205 5293 5413 5416 5474 5618 5622 5655 5689 5707 5743 5744
				5752 5794 5797 5798 5825
L7	0007	0740		1262 1264 1304 1305 1306 1317 1347 1464 1544 1557 1559 1574 1590 1602 1608
				1613 1640 1675 1676 1681 1690 1691 1702 1741 1744 1765 1781 1784 1805 1849
				1850 1876 1942 2064 2092 2093 2105 2115 2135 2144 2186 2253 2269 2270 2346
				2389 2390 2391 2462 2465 2468 2565 2597 2599 2600 2616 2628 2636 2640 2641
				2646 2732 2786 2796 2833 2853 2886 2919 2946 2947 2949 2950 3054 3059 3082
				3084 3116 3128 3132 3135 3146 3232 3240 3242 3248 3260 3262 3270 3287 3287
				3289 3291 3293 3300 3303 3309 3364 3365 3392 3408 3427 3435 3436 3471 3484
				3511 3537 3597 3631 3658 3659 3660 3729 3745 3842 3844 3849 3850 3852 3853
				3854 3856 3886 3945 4008 4011 4016 4075 4076 4082 4104 4207 4214 4328 4332
				4340 4343 4358 4370 4372 4380 4390 4395 4397 4406 4475 4478 4485 4487 4492
				4562 4624 4628 4632 4666 4667 4668 4720 4728 4956 4957 4959 4960 5202 5203
				5205 5238 5239 5255 5257 5369 5470 5545 5575 5614 5620 5624 5626 5640 5642
				5656 5685 5697 5703 5751 5752 5758 5758 5795 5796 5807
L8	0008	0741		1255 1263 1301 1302 1303 1304 1306 1307 1308 1340 1346 1375 1376 1449 1450
				1463 1491 1493 1497 1499 1667 1668 1669 1740 1761 1768 1783 1789 1792 1804
				1941 1944 2058 2060 2063 2067 2067 2104 2133 2152 2157 2185 2252 2345 2410
				2410 2521 2524 2551 2553 2580 2582 2585 2668 2702 2721 2727 2735 2744 2770
				2771 2821 2828 2881 2889 2891 2897 2898 2907 2909 2910 2913 2944 2981 2990
				3006 3007 3058 3077 3086 3123 3125 3145 3241 3243 3249 3261 3263 3286 3345
				3348 3350 3351 3352 3353 3366 3380 3381 3393 3394 3406 3421 3426 3432 3460
				3461 3466 3470 3556 3610 3630 3876 3877 3885 3901 3902 3914 3915 3928 3929
				3931 3932 3933 3935 3944 3957 3958 3961 3972 3973 3984 3985 4049 4050 4060
				4103 4147 4158 4307 4438 4445 4448 4465 4476 4504 4524 4610 4611 4612 4620
				4621 4622 4655 4662 4663 4664 4665 4677 4678 4684 4685 4695 4708 4709 4711
				4719 4766 4795 4804 4805 4805 4806 4841 4842 4843 4955 4958 4961 4961 4964
				4967 4969 4994 4995 4996 4997 5000 5002 5003 5004 5005 5008 5009 5010 5011
				5153 5195 5196 5200 5206 5208 5221 5222 5223 5224 5225 5226 5227 5237 5239
				5240 5241 5257 5275 5289 5290 5291 5292 5293 5294 5295 5296 5297 5328 5330
				5332 5362 5364 5364 5368 5424 5425 5428 5444 5445 5445 5446 5449 5456 5457
				5458 5469 5477 5479 5671 5676 5680 5688 5742 5749 5762 5766 5772 5774 5802
				5828 5830 5850
MIARBB	0018	1101		1186 1350
MIARBD	0018	1102		1187 1351
MIAREB	0014	1103		3823
MIARED	0014	1104		3824
MSC1	0013	0754		1399 1611 1636 1831 1851 1854 1855 1883 1886 1930 1933 1939 2218 2226 2233
				2245 2290 2308 2327 2328 2340 2343 2350 2371 3371 3497 3524 3533 3761 3771
				3969 3981 4024 4084 4164 4533 5436 5491 5568 5800 5861
MSC2	0014	0755		1400 1517 1520 1667 1707 1952 2089 2416 2418 2431 2435 2464 2611 2663 2699
				2722 2728 2755 2800 2830 2849 3107 3457 3492 3506 3553 3575 3578 3584 3587
				4045 4052 4071 4141 4148 4170 4172 4265 4346 4356 4466 4472 4502 4508 4550
				4557 4588 4756 4800 4808 4857 5023 5250 5418 5472 5605 5634 5678 5687 5731
				5735 5818 5819
MUREC	0020	1055		1930 2328 4164 4533 5436 5491 5861
MUTRK	0040	1054		1933 1939 2233 2245 2290 2308 2340 4164 4533 5436
NFILEXFR	0001	0939		1926 3042 4378 5590
NOAM	0008	0907		2895
NOOP	0008	1022		2074 2509 2677 2713 3344 3991 4008 4606 4619 4718 4732
NORMEND	0008	0870		1498 1895 1899 2132 2141 3056 3066 4229
NOSYNC	0004	0908		2896 2903
NREC	001C	0763		1931 2086 2329 2336 2515 2662 3566 3568 3570 4140 5413 5467 5823 5824
ODDXFER	0001	1004		3493 4556 4559 5604 5606
ONLINE	0008	0885		1470 3402 3412
OPEND	0010	1021		3374 3991 4011

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
ORGREC	0588	2022		4176
PAC	000E	0747		1405 1800 1802 1808 2172 3352 3551 3598 3891 4631 4664 4667 4982 5528
PADTOIDX	0010	1031		1790 1841 2497 4977 5546 5571
PAH	000F	0748		1406 1631 1799 1807 1859 1861 1935 1946 1960 2173 2284 2344 3353 3552 3599 3892 4627 4665 4668 4852 4983 5391 5394 5402 5448 5451 5529
PHYADDR	0010	0813		
POLLCNTL	0002	0789		
POLLDEV	0082	0788		
PROCDAT	0001	1035		1932 2608 2739 2908 4133 4160 4179 4197 4209 4354 4532 4547 5433 5488 5504 5632 5859
PROCKEY	0002	1034		1932 2376 2607 2623 2738 2912 4136 4160 4179 4197 4209 4316 4532 4539 5433 5488 5504 5596 5859
PROCNT	0004	1033		1934 2237 2281 2296 2311 2313 2341 2359 2681 4179 4182 5488 5501 5557 5859
PRGCRO	0008	1032		2189 2205 2236 2680 4123 4182 4209 5501 5504 5557
QBYT	000C	0745		1460 1461 1462 2560 2602 2603 2615 2714 3254 3342 3346 3367 3368 3381 3394 3488 3588 3636 3637 3674 3755 3756 3759 3760 3766 3783 3923 4009 4673 4686 5322 5323 5734
RBYT	000D	0746		1848 1852 2238 2239 2240 2619 2679 2736 2915 2933 2935 3143 3256 3369 3376 3380 3390 3393 3627 3642 3645 3651 3653 3656 3659 3678 3679 3680 3681 3686 3690 3691 3694 3695 3696 3704 3705 3706 3708 3709 3758 3762 3764 4042 4102 4253 4324 4442 4451 4526 5423 5427 5447 5459 5485 5486 5505 5602
RCSCHK	0001	0982		
RDCNTL	000A	0798		1241
RDERROR	0004	0794		3093 5170 5175
RDGATE	001C	0861		
RDG1	0040	0822		1870 4213
RDG2	0060	0824		4246 4336
RDG3	0050	0823		4244
RDG3AM	0070	0825		4206
RDG4	0030	0821		1483 2400
RDSNS	0080	1053		3371 3497 3524 3533 3761 3771 3969 3981 4024 4084 5800
RDSTATUS	0084	0792		1253 1468 1856 3358 3612 5133 5496
READ	0080	1039		1622 2223 2232 2244 2257 2298 2377 2618 2904 2914 2932 4101 4180 4198 4202 4211 5559
READOP	000E	0801		1482 1869 4215 4243 4379
REC	0019	0760		1572 1632 1634 1664 1927 1945 2183 2234 2248 2249 2280 2310 2338 2353 2354 2356 2453 2661 3562 3567 4131 4131 4177 4181 4185 4187 5389 5466 5490 5493 5821 5822 5862
RECLNG	0510	1984		
RECYCLE	0040	0987		
RESPONSE	0008	0917		2408 2409 4230 4231
REZERO	0002	0849		1272
RG1UNORT	0002	0899		
RSTATTN	0004	0847		1267 3606 3860 3937 4703 5307
RSTRDWR	0005	0795		4282
RWCHK	0010	0884		
RWCTRL	0007	0858		
ROCTODF	0080	1028		2824 4123 4248 5248
SBFLAGS	0522	1997		3928 5347
SB0	003F	0726		1228 1413 1416 1424 3372 3429 3487 3834 3837 3872 3912 5350
SB1	0037	0727		1229 1373 3328 4016
SCANEQUL	0040	1020		2333
SCANHI	0040	0933		2993 2999 4527
SCANRD	0080	0932		2969 2993 2999 4561
SCANSTOR	051C	1990		2717 4522
SCANSW	0080	1063		2728 4472 4502 4508
SCN	002F	0718		1226 1331 1395 1846 1866 1888 1914 1926 2080 2090 2091 2150 2159 2335 2397 2401 2876 2969 2983 2991 2993 2997 2999 3009 3040 3042 3045 3050 3091 3528 4239 4266 4317 4323 4360 4376 4378 4527 4540 4548 4558 4561 4571 4944 5276 5558 5590 5597 5607 5610 5644
SCNEQ	0002	0958		1393 2332 2989 3005 3772
SCNSAT	0004	0957		1393 1915 2331 2715 2984 2988 2992 2998 3004 3010 3772
SCNSPLIT	0020	0934		2401 4571
SDFORHA	051A	1989		2692 5456 5507
SDH	001D	0764		1594 1599 1626 1630 1661 1670 1677 1679 1682 1692 1697 1703 1714 1719 1720 1744 1748 1751 1756 1761 1765 1768 1773 2196 2198 2203 2690 2693 3171 4362 4363 4400 4401 4564 4565 4736 5508 5514 5518 5522 5526 5531 5535 5541 5646 5647

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
SDL	001E	0765		1490 1594 1598 1626 1629 1662 1670 1676 1680 1681 1691 1698 1701 1702 1713 1716 1718 1721 1743 1747 1750 1753 1755 1760 1764 1767 1772 2194 2197 2201 2389 2395 2691 2694 3173 4330 4332 4567 4737 5509 5515 5519 5523 5527 5531 5534 5540 5616 5656
SELACT	0080	0866		
SELCNTL	0003	0791		
SELDEV	0083	0790		
SELHOLD	0040	0915		1238 1249 1277 3791 3864 3989 4023 5340
SENSTAT0	0003	0852		5180
SENSTAT1	0083	0853		3447 4740 4988 5137
SENSTAT2	0043	0854		5140
SENSTAT3	0023	0855		5143
SENSTAT4	0013	0856		5183
SETDIFF	008C	0806		
SETHAR	008B	0805		1863
SETRDWR	0085	0793		2056
SETRWON	0004	1002		1798 4232
SETUNSUP	0001	0787		1259
SIZE12	0004	1067		1952 3457 4800 4808 4857 5023
SKCMPL	0001	1024		1370 3344 3389 3431 3434 4706 5336
SKDONE	0001	0888		
SKMARK1	051F	1993		1301 7946 3364 3849 3876 3901 3932 3957 3984 4708 5202
SKMARK2	0520	1994		1375 3435 3914 3972
SKSTART	0008	0846		
SNSDIFF	0009	0850		
SNSHAR	0005	0851		
SNSINFC	0069	0803		1256 5166
SNSRDWR	0008	0857		5146
SPFMTG1	00C0	0836		5537
SPFMTG2	00E0	0837		5655
SPRDG2	00E0	0826		4331
SPRESET	0080	0953		
SRCH	0040	1040		1600 1618 1843 2178 2188 2221 2294 2305 2372 2931 4180 4183 4198 4203 4249 5437 5492 5863
STACKCMD	0080	0997		3770 3806 3908 3962 3988 4012
STAT	0008	0744		1367 1370 1373 1401 2074 2333 2509 2564 2579 2606 2655 2677 2713 2737 3344 3374 3389 3431 3434 3880 3883 3943 3991 4606 4619 4706 4718 4732 4753 4936 4937 5320 5321 5336 5337 5339 5367
STATOVN	0008	0898		
SUBTRACT	0002	0973		2645 3211 3216 3225 3237 3272 3621 3717 4503 4516 5690 5848
SVPOPT	0521	1995		3453 3817 4804 5444
SVPREQ	0002	1087		1336 3814
SYNCIN	0004	0871		2094 2097 2103
SYNCOUT	0080	0986		
TAGATE	0080	0914		1343 1488 1496 2057 2066 4032 5623
TAGVALID	0040	0867		1492 2059
TCUCKSIZ	0167	1474		1460 1461 1462
TCUCKWRT	015A	1460		3474
TCUCNV12	014B	1439		4858
TCUDMERR	015F	1465		3472
TCURSTSB	0148	1422		1371 3926 3970 4014 4020
TCUSETUC	0144	1413		1369 1466 3882 4013 4021 5335
TCUSTART	011F	1366		2810 3383 4712 4775
TDSAFTRO	0272	1639		1621
TDSCKDAT	031A	1688		1704
TDSCKMVS	032B	1706		1693
TDSCKSRH	024F	1600		1593 1595
TDSDCC	0212	1534		1548
TDSDCON	0200	1516		4179 5481
TDSDC1	020A	1526		1522
TDSDC2	020D	1529		1525
TDSDC3	0216	1538		1533 1535
TDSDC4	0218	1540		1537
TDSDEKEY	032F	1710		1706
TDSDISP	0221	1549		1542
TDSDONE	033C	1723		1671 1683
TDSDOSD	025D	1617		1570
TDSD1D4	0344	1747		1766

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TDSD2	0350	1759		1749
TDSEXIT	0252	1603		1569 1618
TDSFGOK	0264	1624		1619
TDSFORRO	0237	1576		1641
TDSINVCF	0275	1643		1622
TDSINVTK	0262	1622		1572
TDSLONGF	0331	1712		1707
TDSLOP1	0171	1492		1494
TDSLOP2	0177	1498		1500
TDSMRG	016D	1488		1484
TDSMVSP	0349	1752		1762
TDSNODEF	035D	1772		1769
TDSODDTK	026E	1634		1631
TDSPAST2	0354	1763		1745
TDSRDG4	0168	1482		4242 4256 4335 4375 4568 5584
TDSRECLN	0253	1605		1575 1600
TDSRSTCT	025A	1612		2170
TDSSEXIT	0271	1637		1635
TDSSOVFL	0270	1636		1633
TDSSPD1	034C	1755		1752
TDSSREC	026B	1631		1617 1625 1627
TDSSTART	0300	1661		5563 5586
TDSSTRSD	0339	1720		1717 1758
TDSSTRTC	0250	1601		1610 1614
TDSTSTSH	0330	1711		1709
TDSUPTRK	0230	1569		2219 2231 2287 2295 4271
TDSUP1	0241	1586		1582
TDSUP2	0245	1590		1585
TDSWFLD	0317	1685		1678
TDSWRG4	016B	1486		5561 5617
TDSWR1	0175	1496		1492
TDSWR2	017B	1502		1498
TDSZSD	0337	1718		1696 1711 1715 1771
TDS4DATA	033D	1740		1672
TDXACT	0425	1866		1858
TDXALTRK	047B	1962		1947
TDXCNTOP	045B	1928		1925
TDXCYLSK	036C	1797		1951 1954
TDXDEFTK	0466	1941		2181
TDXFLPHD	041F	1859		1936
TDXFMTWR	0433	1883		1845
TDXGOON	045F	1932		1929
TDXIDXOK	0435	1885		1883
TDXIDXP2	0418	1852		1939
TDXIDX1	041B	1855		1851
TDXINCOP	0454	1918		1895
TDXINDEX	040A	1838		2096 2927
TDXINVTK	044A	1906		1896 1897 1898 1900 1903 1904 1910 1926
TDXLT12	0406	1829		1825
TDXL712	0374	1805		
TDXL746	0467	1942		3158 3162
TDXL800	0373	1804		1801
TDXNEOC	0376	1807		1799 1803
TDXNEOK	044B	1908		1899
TDXNHAOP	0438	1888		1882
TDXNOP	0458	1925		1918 1920
TDXNTDEF	0469	1944		1940
TDXNTSCH	0431	1881		1843
TDXNTWRT	043F	1895		1893
TDXNT12	0474	1955		1952
TDXODDTK	0464	1939		1935
TDXOPC	0440	1896		1894
TDXOPDON	0453	1916		1930 1931
TDXRDG1	0425	1865		1832
TDXRESP	0412	1846		
TDXRETUN	0367	1788		1782
TDXSCNCH	045A	1927		1915 2351
TDXSKCPL	0400	1823		4705

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TDXSKP1	0479	1960		1957
TDXSTHAR	0421	1861		1961
TDXWADEX	0360	1781		2349 2499 2926 4979 5495 5499
TDXWAIT	0361	1782		1785
TEFCE	0722	2099		2130 2143
TEFCKDD	082C	2267		2223
TEFCKVKD	0849	2299		2257
TEFCLKCT	0853	2314		2305 2311
TEFCLKRO	077C	2206		2184 2188 2189
TEFCMPKD	0940	2460		2260 2291
TEFCMPOK	0824	2256		2251
TEFCMPR	0931	2440		2250 2285
TEFCONTU	085E	2327		2307
TEFCOUNT	0800	2217		2324 2361 2474 2477
TEFCTNXT	085D	2325		2314 2318
TEFDATA	084A	2305		2476
TEFDATA1	090B	2388		2480
TEFDECOD	0949	2473		2162 2163
TEFDRPTG	070A	2066		2059
TEFEND	080A	2227		2218
TEFENDHA	0757	2169		2473
TEFENDPO	0861	2330		2332 2337
TEFENDRO	080D	2231		2275 4100
TEFEROC	0839	2283		2279
TEFFCTOK	074D	2154		2150 2151
TEFGETKD	091D	2416		2241 2258
TEFIDXFD	071F	2096		2101 2128 2142
TEFINVTK	0870	2345		1623 1906 2428 2430 2433 4106 4404
TEFKEY	0900	2371		2475
TEFKEY1	0909	2385		2479
TEFLASTB	0738	2127		2116 2117 2136
TEFL401	0706	2062		1495
TEFL703	0708	2064		2890 3422 4309 4657 4696 5806
TEFL711	0871	2346		
TEFL714	0821	2253		
TEFL80C	0750	2157		1913
TEFL80D	0767	2185		2182 2282
TEFL821	0748	2152		1909
TEFNCE	0726	2103		2098
TEFNDEF	076A	2188		2177
TEFNECE	0743	2141		2127 2129 2131 2145
TEFNEEDL	0817	2241		2238
TEFNOHIT	0866	2335		2331
TEFNOREP	072A	2107		1501 1884 2137 2146 3061 4228
TEFNOTS	0768	2189		2179
TEFNRERR	0707	2063		1787 2108 2885 3098 3397 3401 3418 3445 4292 4676
TEFNRF	0820	2252		1853 2261 2262
TEFNTCCD	0922	2421		2417
TEFNTROC	0819	2244		2228
TEFNTWRT	0844	2294		2289 2290
TEFNT256	092D	2432		2427
TEFNWRCT	0804	2221		2217
TEFODTRK	087F	2363		2284
TEFORL1	092C	2431		2434
TEFPAC	0733	2119		3174
TEFPAOK	075F	2177		2175
TEFRCDFD	083F	2289		2286
TEFRDCNT	0852	2313		2340
TEFRDK	0812	2236		2233 2245
TEFRDKS	0814	2238		2248 2249 2299
TEFRDRO	077B	2205		2190
TEFRECO	081E	2250		2234 2244
TEFREGWC	086E	2343		2354
TEFRESP	091A	2408		1344 1502 1847 1892 2154 2879 3075
TEFRETRY	071C	2093		1887
TEFRSTAT	071A	2091		2079 2085 2086 2087 2089
TEFSCAN	0826	2258		2298
TEFSETRW	0700	2056		1829 2938 4122 4132 4162 4174 4195 4529 5421 5475 5826

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TEFSKP1	0776	2200		2195 2196
TEFSKP2	077A	2204		2199 2202
TEFSKP3	0773	2197		2200
TEFSPD	0902	2373		2371 2376
TEFSPK	0811	2235		2226 2236 2237 2272 2292 2293 2296
TEFSRCH	0835	2279		2221
TEFSYFND	072C	2112		2094 2097 2103
TEFSYNLP	071D	2094		2106
TEFTGVAL	0701	2057		2075 3051
TEFWADEX	0874	2349		2344
TEFWAIT	070C	2074		4221 5578
TEFWAIT1	0703	2059		2061
TEFWCCD	0877	2353		2342
TEFWKEY	0828	2260		2256
TEFWRCNT	086D	2342		2312
TEFWRK	082B	2263		2297
TEFWROK	0873	2348		2327 2343
TEFWRO	0770	2194		2171
TEFXFEND	0749	2150		2141
TENAJAX	096C	2538		2553 2669 2703 3557
TENALCF	0A78	2697		2684
TENCHCNT	0965	2523		2518
TENCHK	0A1A	2593		2575 2579 2716 3167
TENCHKDR	0B13	2730		2727
TENCHXFR	0A7C	2701		2699
TENCH5	0A7C	2695		2686
TENCNTR	0842	2783		2711 2713 2738 2741 2762
TENDCF	0959	2511		2507
TENDDCF	0A50	2653		2511 2580 2631 2632
TENDDDF	0B00	2711		2705
TENDDDR	0A1C	2595		3166
TENDER	0A2D	2613		2608 2611
TENDFCCH	0B29	2752		2736
TENEND	0A12	2584		2581
TENFGONE	0B6E	2838		2821
TENFLGO2	0B7A	2862		2659 2698 2758
TENFRDHA	0B17	2734		2714
TENGOWAT	0A07	2570		2568 2567
TENHACNT	0A61	2674		2653
TENHOP	0A00	2560		2522 2526 2530
TENKLDL	0B26	2749		2737 2739
TENKTEST	0B1F	2742		
TENLINE	0A26	2606		2602 2603
TENLOOK	0A3E	2630		2617
TENLSOK	0B2F	2758		2755
TENLTEST	0B24	2747		2743
TENL825	0A10	2582		3525
TENNOK	0A32	2618		2631
TENNOZER	0A13	2585		2574
TENOPDWN	0954	2503		2498
TENOPEN	0B6C	2835		2832
TENRDHA	0A6C	2685		2679
TENSCNOP	0A4B	2645		2604 2638 2733
TENSCNOR	0A4C	2646		2643
TENSDDCF	0B6F	2845		2666 2701
TENSDDDF	0B5E	2821		2723 2776 4065 4159 4771
TENSTART	0951	2497		1916 2227 2330 2334 5325
TENTENA1	097D	2555		2702
TENTENA2	097E	2556		2668
TENTENB1	0A7F	2704		2555
TENTENB2	0A61	2673		2556
TENTIOA1	097C	2554		3556
TENTIOB1	0B6E	2837		3538
TENTIOB2	0B79	2855		3539
TENTIO63	0A0B	2574		2569 3540
TENTIOB4	CA1A	2592		3541
TENTOTCU	0B5D	2810		2783 2807
TENWRKD	0A0D	2579		2560

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TENWROP	0A41	2634		2615
TENWRTST	0A2F	2615		2606 2607
TENW500	0A08	2571		2564 2572
TENXDDCF	0A5C	2665		2663
TENXDDDF	0A7F	2705		2675 2677 2680 2681
TENXP2	0B36	2768		2746 2748 2751
TENZDDDF	0B3E	2776		2770 2773
TENZER	0A15	2587		2584
TENZP2	0B3C	2774		2771
TERALTRK	0D63	3148		1962
TERCEANZ	0C04	2880		1921
TERCHKIG	0C33	2931		2922 2923 2925
TERCKEND	0C00	2876		2102
TERCNT	0C2D	2921		2901
TERCORR	0D21	3082		3055
TERDATCK	0C16	2898		2894
TERDISPL	0D4E	3127		3121
TERDOECC	0D00	3040		2905
TERDOIDX	0C32	2927		2895
TERECCHK	0D30	3097		3106
TERECCLP	0D0F	3055		3060 3068 3070
TEREOPCK	0C0E	2890		2892 2896
TERFCTO	0D16	3065		3057
TERGETSD	0D77	3171		2128
TERINCDR	0D72	3163		2573
TERINCHH	0D6E	3159		3149
TERLOWCT	0D2A	3091		3083
TERL704	0C2B	2919		2914 2917 3078
TERL705	0C0A	2886		2158 2882
TERL707	0C43	2950		
TERL724	0D61	3146		
TERL814	0C0D	2889		1902
TERL828	0C5B	2981		2988 2989 3004 3005
TERMSG45	0C25	2913		2911 2931 2932 2934
TERMSG46	0C21	2909		2902
TERMSG47	0C1F	2907		2903
TERNORME	0D1C	3074		3056 3066
TERNOVRN	0C0C	2888		2880
TERNSCNT	0C2A	2918		2900 2915
TERNSYER	0C0F	2891		1905 2888
TEROUT	0C76	3009		3006
TERPACHK	0C3D	2944		2176
TERRSCNT	0D22	3083		3090
TERSET53	0D5E	3143		3126 3134
TERSKPA	0D27	3088		3085
TERSTART	0C4B	2965		3707 3710
TERSYNC	0C7A	3016		2976 2977 2978 2986 2987 2994 3000 3001 3002
TERTABLE	0C45	2958		2965 2966
TERTEST1	0C56	2976		
TERTEST2	0C60	2986		2980
TERTST34	0C65	2991		3008
TERUNCOR	0D1F	3077		2906 3118 3122 3144
TERZLWP	0D5D	3142		3138
TERZPATN	0D5A	3139		3076 3137
TFECEXIT	0E69	3309		3306
TFECHECK	0E75	3324		3253
TFECLOOP	0E65	3305		3308
TFECODE	0E64	3304		3297 3301
TFESETUP	0E6C	3313		3223 3278 3319 3325
TFCSKIP	0E4A	3278		3259
TFETIO	0E06	3210		3635
TFETIOB1	0E1E	3234		3546
TFETIOB2	0E44	3272		3547
TFETIORS	0E70	3318		3245 3247
TFETIORT	0E71	3319		3255 3257
TIMEOUT	0020	0988		
TIOADCHK	1028	3526		3524 3534 5801
TIOATTN	0F41	3410		3405

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TIOBEGIN	0F78	3465		3373 3375 3382
TIOBZOFF	0F59	3434		3430
TIOB57OK	0F4A	3419		3416
TIOCHXFR	101E	3516		2629 2834 2854 3233 3271 3537 3731 5686 5698 5704
TIOCKDM	0F5F	3440		3431 3434
TIOCKOFF	0F4E	3423		3420
TIOCKSIZ	0F6A	3451		1474
TIOCKWRT	0F7E	3474		3449
TIOCLEAN	0F29	3383		3379 3389 3390
TIOCMDEC	1100	3627		3590
TIOCMRJT	1102	3629		3647 3652 3667 3690 3691 3694 3695 3705 3706 3708 3709
TIOCTROK	0F39	3402		3398
TIODDDR1	1078	3618		2590 2594 2779 4068 4455 4774
TIODFEND	102C	3530		3517
TIODIAG	0F22	3376		3370
TIODMER	0F3F	3408		
TIODMINT	0F79	3466		3463
TIODMRDY	0F12	3360		3414
TIODOATT	1066	3594		3361
TIODOSIO	1000	3481		3465
TIODRV1	0F07	3349		3346
TIOEQCHK	0F4D	3422		
TIOFWAIT	101F	3517		2570 3523
TIOGREAT	1062	3587		3573
TIOINFOK	0F54	3429		3424
TIOL700	1104	3631		3467 4796 5450
TIOL71B	0F52	3427		
TIOL827	0F57	3432		3439
TIONOATN	0F14	3362		3360 3614
TIONODR	100A	3491		3489
TIONTSNS	0F2A	3387		3367 3368 3377
TIOONLIN	0F46	3415		3402
TIOQ1	1111	3651		3637
TIOQ1TAB	111B	3661		3658 3660
TIOQ2R1	112E	3684		3681
TIOQ2R2	112F	3685		3680
TIOQ2R3	1133	3689		3686
TIOQ2R4	1134	3690		3679
TIOQ2R8	1138	3694		3678
TIOQ2R9	113D	3699		3696
TIOQ23	1127	3674		3636
TIOQ3	113E	3703		3674
TIOQ3R8	1143	3708		3704
TIORDDCR	1146	3714		2538 3498
TIORDDDR	114B	3722		2588 2724 2777 3165 3210 3490 4043 4066 4772 5843
TIORNTO	1053	3572		3567
TIORNZ	110E	3645		3642
TIOROK	1106	3634		3628
TIORORC	1063	3588		3585 3586
TIOSELCK	0F4C	3421		
TIOSETUP	114E	3725		3718
TIOSIO	0F00	3342		3992
TIOSIZER	0F7B	3470		3451 3452 3459
TIOSKALL	1065	3590		3497 3588
TIOSKDM	0F77	3464		3456 3458
TIOSKOK	0F30	3393		3388
TIOTENA1	1034	3538		2833
TIOTENA2	1035	3539		2853
TIOTENA3	1036	3540		2565
TIOTENA4	1037	3541		2628
TIOTENB1	1047	3559		2554
TIOTFEA1	103C	3546		3232
TIOTFEA2	103D	3547		3270
TIOTFERT	1108	3636		3322
TIOTIOA2	1038	3542		3729
TIOTIOB1	103E	3549		3511
TIOTIOB2	1155	3732		3542
TIOTWRA1	1039	3543		5685

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TIOTWRA2	103A	3544		5703
TIOTWRA3	103B	3545		5697
TIOUDDCR	1148	3716		2546
TIOUDDDR	114D	3724		2649 3224 3238 3279 3320 3326 3622 4520 5849
TIOVERKD	1125	3671		3664
TIO70MB	0F72	3459		3455
TIPBADNS	1307	3967		3962
TIPBADYS	1320	4005		3963 3969
TIPBSDA	1160	3749		
TIPBSGEN	1174	3782		1366 2808 2945 3363 3403 3920 3983 4005 4077 4682 4698 4707 5201
TIPDFDR	130E	3974		3971
TIPDIFDR	132E	4019		3974 4007
TIPDMEXM	1220	3838		3873 3874
TIPDSDRV	1332	4023		4018
TIPGETPA	131F	4001		3999
TIPGETQR	1161	3755		3968 3980
TIPGO1	116C	3766		3759 3760
TIPGO2	1173	3773		3763 3765
TIPGO3	1311	3982		4024
TIPIDLE	1202	3808		1310 1407 3987 4025 4074 4085 5341
TIPL701	124D	3886		
TIPL815	124C	3885		3881
TIPNEXT	1205	3811		3867
TIPNIREQ	123F	3872		3831
TIPNOCHK	1335	4032		1240 1243 1246 1248 1254 1257 1260 1268 1270 1273 1276 1469 3359 3411 3442 3448 3607 3613 3795 3829 3861 3938 4284 4704 4741 4989 5134 5138 5141 5144 5147 5167 5172 5177 5181 5184 5309 5311 5314
TIPNOSTK	127A	3944		4700
TIPNOSVP	1215	3827		3814 3822
TIPNSCOM	123A	3864		3838 3862 3875 3904 3939
TIPSCSTK	1265	3920		3908
TIPSETSC	126C	3927		3913 3916
TIPSIO	127D	3948		3807 3911
TIPSIO1	130F	3980		3948
TIPSKBAD	1279	3943		3905 3906
TIPSKCHK	1300	3957		5338
TIPSKCOM	1255	3901		3858 3863
TIPSKEXM	1239	3863		3832 3839
TIPSLECT	1178	3791		1252 3356 3811 5366
TIPSTKCK	1200	3806		3868
TIPSTKCM	127E	3949		3806
TIPSTK1	1312	3983		3949 3981
TIPSTRTN	1203	3809		
TIPUCM	124E	3887		3946 5370
TIPUCWPT	131C	3998		1261 3840 3887
TIPZEROW	1159	3742		3608 4942 5001
TIPZERO3	115D	3746		4954
TOFILE	0002	0938		1331 2080 2159 3045 3050
TRDCHKSP	1528	4330		4362
TRDCHKO	1560	4395		4410
TRDCKD	1438	4194		3663
TRDCKDD	1424	4170		3665
TRDCKDEN	144D	4215		4208
TRDCNTR	1532	4337		2402 4334
TRDCOMP	1365	4086		2230
TRDCOUNT	145C	4239		2206 2325
TRDCPHAR	1516	4305		4299
TRDDATA	153F	4354		2378 4327
TRDDGN	1436	4188		2940 4184 4186 4201
TRDDLNTO	1568	4403		4395 4408
TRDDOWN1	1417	4152		4149
TRDENTRY	144E	4216		5549
TRDEXTG4	1550	4375		4400
TRDFUPCF	1579	4423		4418
TRDG3AM	1444	4206		4258 5438
TRDHAROE	1400	4119		3662
TRDHAROO	1402	4121		3670
TRDINVCF	140F	4142		4170 4172

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TRDINVTK	1569	4404		4393 4407 4409
TRDKD	140D	4140		3661
TRDKEY	151D	4316		2242 2271
TRDKNTO	156A	4405		4394
TRDMEVEN	1570	4414		3554
TRDMODD	1575	4419		2664 2700
TRDNODEF	1531	4336		4329 4361 4364 4566 4569
TRDNOFBI	1504	4286		1857 1864 4646 4649 4660 4670 4690 5497
TRDNOP	151B	4310		4298 4306
TRDNOSP	1471	4260		4248 4249
TRDNOSPL	1530	4335		4330
TRDNRO	1433	4185		4181
TRDODTRK	1479	4269		2363
TRDOPDWN	1500	4282		1797 2503 2937 4980
TRDRDEFS	1339	4042		3982
TRDRDFBI	150D	4295		1890 2877 3074 4035
TRDRDG1	144B	4213		5500 5502
TRDRDHA	1449	4211		4125
TRDRDKD	1440	4202		4165
TRDRSTDM	135A	4075		4042
TRDRWAIT	1457	4229		4227
TRDRWEND	1454	4226		1830 4188 42C4 4212 4229 5431 5482 5856
TRDRZERO	1447	4209		
TRDROKDO	1407	4130		3669
TRDSBTIM	1503	4285		3095 3100 3103 4303 4652 5406
TRDSCHA	144A	4212		
TRDSCSRH	1441	4203		4534
TRDSDXFR	141C	4158		4147 4150 4151
TRDSKP	150B	4293		4289
TRDSPCOM	1551	4376		4399 4402
TRDSPDAT	1559	4388		2373
TRDSPDLO	1562	4397		4551 5636
TRDSPKEY	154A	4369		2235 2288 4272 4544
TRDSPKLO	155A	4389		4372
TRDSPLIT	152C	4331		4572
TRDSPNTO	1563	4398		4396 4403
TRDSTCNT	1470	4259		4253 4255
TRDUSHA	1448	4210		4135
TRDVKD	141E	4160		3672
TRD11MS	1452	4220		1877
TRD5US	1506	4288		4293 4294
TRKCNTR	050E	1983		2114
TRKOFL	0001	1059		1611 1636 2343 2350
TRKOVN	0010	0910		1904
TRSERREG	011D	1357		1350 1351
TRSEXIT	0073	1298		1186 1187
TRSEXTRG	006D	1288		1281
TRSFORCE	0107	1334		1336
TRSLSRST	0002	1161		1156 1294
TRSNOATT	0057	1265		1263
TRSNSLP	0100	1316		1265 1318 4733
TRSNXTDR	004A	1252		1280
TRSREG	0024	1200		1206
TRSRST3	0030	1221		1213
TRSRST3X	0048	1250		1286
TRSTART	0000	1156		
TRSTART2	002D	1212		1157
TRSTRAPA	0104	1331		1296 1354
TRSYSRST	002F	1217		1334 3823 3824
TRS100MS	0068	1282		1284
TSCADJL2	1639	4509		4494
TSCANRD	160C	4455		4442
TSCARMD	161B	4474		4471
TSCCALC	163A	4510		4473 4480
TSCCHKL5	1628	4495		4492
TSCCHKL6	1636	4506		4496
TSCCHKL7	161F	4478		4474
TSCCKSFL	166B	4567		4564

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TSCDATA	1658	4547		2379 4543
TSCDFODD	1626	4490		4466
TSCEOF	161D	4476		4500
TSCEVEN	1664	4560		4557
TSCEVN	1617	4470		4478
TSCFDONE	1641	4517		4477 4505
TSCFETCH	1622	4484		4470 4491
TSCKEY	1652	4539		2259
TSCNODEF	166A	4566		4563
TSCODD	1627	4491		4506
TSCOR	1600	4438		3012
TSCORE	164C	4528		4451 4526
TSCORH	164B	4527		4452
TSCRDDCF	1670	4580		2656
TSCSPD	166E	4571		4567
TSCTWRB1	160A	4451		5853
TSC1BYT	1634	4504		4475
TSKBIGLP	1804	4757		4764
TSKCOK	182B	4811		4802 4806
TSKDIFOK	1731	4658		4654
TSKEND1	1761	4706		4671 4687
TSKGETDM	1776	4738		4734
TSKHIDSK	1704	4610		1813
TSKHIDX	170E	4623		4614
TSKHSLP	1751	4690		4694
TSKINTSK	1744	4677		4672 4674
TSKINVSK	181B	4795		1643 4142 4803 4810 4812 5419 5820
TSKMIN	1720	4641		4637
TSKMOUT	171D	4638		4633
TSKNOZER	177E	4746		4732
TSKOELP	1806	4759		4756
TSKPA	0518	1988		4610 4620 4666 4841
TSKRDSNS	176C	4728		3668 5326
TSKRECAL	1700	4606		3646
TSKRRBLG	1768	4718		3666
TSKSEEK	170A	4619		3644
TSKTOK	1758	4697		4691
TSKUCKON	1800	4753		4746 5054
TSKWIN3	185C	4880		2759 5382
TSKOOSK	1732	4659		4615
TSK1OLP	186A	4894		4896
TSK12LP	183C	4828		4830
TSK2OLP	1878	4908		4910
TSK3WIN	1817	4791		3589 3643 3657 3671
TSK3OLP	1867	4891		4893
TSK54LP	182E	4814		4816
TSK6LP	1831	4817		4819
TSNBY16	1827	5296		5278
TSNCHKWR	1974	5050		4745
TSNCNV12	1966	5036		5023
TSNCONV	1959	5022		4984 5012 5162
TSNCTLCK	1A09	5085		5075
TSNDIFCK	1A12	5096		5077
TSNDMSZE	1A15	5100		5078
TSNDRVCK	1A1A	5106		5079
TSNEXIT	1829	5301		4924 5209 5253
TSNFMCF	1B0F	5252		5247 5248 5250 5260
TSNFMT1	1A28	5132		4925
TSNFMT2	1818	5272		4926
TSNFMT4	1B00	5237		4928
TSNFMT45	1B04	5241		5228
TSNFMT5	1A73	5218		4929
TSNFMT6	1B1F	5288		4930
TSNGEN02	191E	4959		4962
TSNIDLE	183C	5327		5320
TSNNORM	1908	4936		1358 1472 1806 1943 2065 2187 2255 2347 2887 2920 2951 3147 3311 3409 3428 3632 3893 4105 5471
TSNNOSB	1B63	5371		5352

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TSNNTSAM	1B65	5373		5356
TSNNTSK	1956	5015		5007
TSNNT1A	1A47	5166		5157
TSNOPDWN	1933	4980		4978
TSNRETUN	1A08	5083		5088 5102 5109 5111 5113 5116
TSNRSTOR	1868	5376		5359
TSNRWCHK	1A26	5119		5081
TSNSENSE	190A	4939		4721
TSNSKNFL	1B26	5295		
TSNSKTMR	1B4B	5347		3808
TSNSNS16	1A50	5175		5165
TSNSPEC	1929	4970		4965 4968
TSNSVOOK	1A6F	5206		5193
TSNSYMCD	1A00	5075		5192
TSNS12	1925	4966		4963
TSNS2	1928	4969		4966
TSNTABLE	1900	4924		4936 5017
TSNUPGM	1A10	5093		5076
TSNWIN3	1B6B	5380		2657 2678
TSNO2DON	1922	4963		4960
TWRAFTER	1E2D	5775		5765 5771 5773
TWRCHAN	1E3B	5794		5789
TWRCHCNT	1E00	5730		2523 2750 4143 5422 5476 5827
TWRCHEDR	1E5C	5837		4449 5429 5480
TWRCHKCR	1E35	5788		2540
TWRCHKDR	1E37	5790		2589 2730 2778 4067 4458 4773 5844
TWRCHKFL	1C21	5452		5448
TWRCHKLO	1E48	5807		5799
TWRCHKSP	1D33	5616		5646
TWRCHNOW	1D62	5684		5678 5680
TWRCKD	1C31	5468		3688
TWRCKDRO	1C51	5501		5490
TWRCOM1	1D0F	5572		4260
TWRCOM2	1D12	5575		4267 5591
TWRCOUNT	1D00	5557		2204 2348
TWRDATA	1D3F	5632		2375 5613
TWRDLNTO	1D49	5642		5634
TWREVNHD	1B70	5391		3687 4119 4173 5460 5814
TWRFDDDF	1D55	5671		4441 5426 5478 5829
TWRFMT2E	1E44	5803		2134 2153 2552 2583 2586 2985 3087 3433
TWRGOTDF	1D7E	5712		5671 5687 5688 5709
TWRGT256	1C06	5419		5472
TWRG1OP	1C52	5502		5505
TWRHA	1C55	5507		
TWRHARO	1C53	5504		5485 5486
TWRHAROE	1C19	5443		3684
TWRHARO0	1C19	5444		3699
TWRHDSET	1B75	5396		5393
TWRINVCF	1E51	5820		5817 5818 5821 5822 5823 5824
TWRKD	1C00	5413		3683
TWRKDCMD	1D2C	5609		5602
TWRKEY	1D1F	5596		2220 2263
TWRLDFCT	1D3D	5626		4383
TWRL51	1E5E	5839		5837
TWRL780	1C33	5470		
TWRL800	1C32	5469		5417 5816
TWRL802	1C1E	5449		3438 5451 5454
TWRL824	1E41	5800		2620 5808
TWRMERGE	1E1E	5760		5743
TWRMRG1	1D2F	5612		5605 5608
TWRMRG2	1D36	5619		
TWRM256	1E2C	5774		5770
TWRNKLDL	1E16	5752		5759
TWRNMANY	1C65	5524		5516 5520 5521
TWRNMHA	1C5E	5517		5513
TWRNMRO	1C62	5521		5517
TWRNOADD	1E1A	5756		5753
TWRNODEF	1D35	5618		5645 5648

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TWRNZERO	1E27	5769		5760
TWRODDH	1C20	5451		5447
TWRODDHD	1B73	5394		4121 4130 5390 5462
TWROPEN	1D7C	5710		5684
TWRRDG1	1C4A	5494		4189 5864
TWRRKD	1C03	5416		3689
TWRRWCOM	1D37	5620		2399 4349 5658
TWRROO	1C2B	5462		3693 5459
TWRSETHD	1B6E	5389		4161 4194 4528 5420
TWRSPCNT	1D16	5583		5559
TWRSPFLD	1D52	5656		
TWRSPKD	1D50	5654		5616
TWRSTFLG	1C79	5544		5532 5538 5542
TWRSVPOP	1C25	5456		5446
TWRTEN4	1E30	5778		5750 5763 5768
TWRTIOB1	1D65	5687		3543
TWRTIOB2	1D77	5705		3544
TWRTIOB3	1D71	5699		3545
TWRTSCA1	1E6C	5853		4448
TWRTWRA1	1E6A	5851		5428
TWRTWRA2	1E6B	5852		5479
TWRTWRB1	1C11	5430		5851
TWRTWRB2	1C3E	5481		5852
TWRTWRB3	1E6D	5855		5830
TWRWCCD	1E4B	5814		3698
TWRWHAOK	1C2C	5463		5453 5455
TWRWHEW	1E15	5751		5745 5746
TWRWROK	1C35	5472		5468
TWRWSRW	1C11	5431		5427
TWRZDF	1E62	5843		5840
TWRZER	1D44	5637		5635
TWRZP2	1E60	5841		5838
TWR120US	1D14	5577		5627
UCWPTR	051E	1991		1402 2789 3349 3888 4661 4729 4759 4765 4993 5327
UNCK	000A	0743		2809 3404 3407 3423 3425 3485 3595 3830 3833 3848 3884 4683
UNITCHK	0002	1023		1367 2564 2579 2606 2655 2737 4936 4937 5321
UNSOELCH	0020	0860		
UPDTRDUS	0002	1003		2783 4178 4196 4205 4210 4530
WHAOK	0008	1042		1398 2687 3629 3641 3655 3682 3685 3692 3697 3703 3769 4734 5454
WRENABLE	0020	1030		3450 5417 5468 5815
WRGATE	0040	0859		
WRG2	0020	0830		5618
WRG4	0080	0835		1487 2392
WRITE	0020	1041		1893 2256 2289 2297 5432 5483 5857
WRITEOP	000F	0802		1486 5548 5564 5619 5654
W0	0010	0768		4999 5000 5007 5106 5109 5111 5113 5116 5185 5193 5208
W1	0011	0769		4417 4422 4426 4967 4971 4973 5090 5091 5178
W10	001A	0778		4947 5078 5102 5103 5104 5132 5142 5226
W11	001B	0779		4948 5145 5227 5272
W12	001C	0780		4949 4964 4999 5120 5148 5219 5222 5273
W13	001D	0781		4950 5013 5220 5223
W14	001E	0782		4951 5014 5276 5292 5297
W15	001F	0783		4952 4953 5277
W2	0012	0770		4969 4975 4992 5076 5094 5155 5191
W3	0013	0771		4997 5182 5186 5188
W4	0014	0772		4996 5086 5097 5098 5163 5168 5169 5173 5290 5295
W5	0015	0773		4985 5164 5174
W6	0016	0774		4986 5082 5085 5089 5093 5096 5100 5108 5110 5112 5114 5119
W7	0017	0775		4955 5015 5083 5083 5086 5087 5091 5094 5098 5101 5104 5106 5107 5115 5117 5117 5120 5156 5189 5240 5242
W8	0018	0776		4945 5075 5077 5079 5080 5135 5153 5224 5275
W9	0019	0777		4424 4425 4946 5139 5225
XFRDDDF	0008	1001		2711 2712 2916 4124 4134 4178 4196 4525 5324
XFRHACNT	0010	1000		2254 2674 2676 2918 4124 4196
XMITCNTL	0009	0797		1274 5313
ZER	0010	0751		1208 1208 1283 1299 1302 1303 1308 1316 1319 1319 1341 1348 1349 1376 1453 1453 1490 1528 1539 1563 1563 1584 1587 1589 1603 1603 1637 1637 1723 1723 1751 1773 1774 1774 1784 1828 1850 2105 2395 2419 2420 2528 2571 2610 2614

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
				2642 2775 2787 2788 2798 2799 2802 2838 2838 2855 2855 2865 2865 3018 3018
				3059 3113 3120 3136 3139 3140 3141 3142 3152 3213 3220 3262 3263 3274 3277
				3522 3530 3531 3535 3535 3581 3598 3599 3735 3735 3773 3773 3843 4001 4001
				4033 4057 4058 4200 4226 4233 4233 4287 4288 4311 4311 4344 4429 4429 4487
				4583 4591 4591 4592 4593 4593 4639 4680 4693 4758 4835 4837 4851 4859 4859
				4912 4915 4915 4940 4940 5259 5358 5378 5378 5402 5403 5405 5416 5457 5458
				5464 5465 5474 5712 5712 5739 5782 5782 5809 5809 5825 5842
ZLSCH	0017	1123		2827 2851 2967 3230 3268 3508 4555 5675
ZLSEXTB	000E	1118		1164 3526
ZLSEXTC	000F	1122		1168
ZLSEXTE	000D	1119		1165
ZLSEXTFC	0009	1120		1166
ZLSEXTFD	000A	1121		1167
ZLSFC	0011	1124		1169 1386 1873 4247 5547 5570
ZLSFCHAN	005B	1131		3230 3508 5675
ZLSFD	0012	1125		1170 1388 4261 4326 5435 5484 5612 5858
ZLSLOCB	0006	1115		1161 4415 4420 4428 4941 4943 4976 4981 5022 5024 5037 5243 5302
ZLSLOCE	0005	1116		1162 1200 1207
ZLSLOC7	0007	1117		1163
ZLSRFILE	004A	1129		1169 1170 1386 1388 1873 4247 4261 4326
ZLSSCHAN	00DD	1132		2827 2851 3268
ZLSWFILE	00CE	1130		2967 4555 5435 5484 5547 5570 5612 5858

1 MISSING QUOTE OR CHARACTER STRING TOO LONG
1 STATEMENTS FLAGGED IN THIS ASSEMBLY
OPTIONS IN EFFECT: BYTEMODE,XREF,NORELOC,NOCARDS,DECK,NODUPE,NOCONTR,NOERRONLY,NODCF3,FL1=OFF,NORLDP LAST P
251 CARD-IMAGES OBJECT OUTPUT

OBJECT CARD LISTING

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

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
M80 6 D B	BD _D8QHD8MH 8*	HD88 D84 8U 8Y	8a D9EHD9IHFH	EZ: EYE EYD EZS	:& *EaFA010001
M80 6 K YG	Y|- YM-DY*- YW	"DY>"DY6" Y="DZ-	D,/3 ZYE Z:E YE	E DQ YDF DY ZQ	EBHQ 'HMFA010002
M80A% 6 UA8M	WFH BHD BHH FH<	B=Q&F- UD8MHC_C	&BH."D OBHH B+|	-FH4 B+¬"BHa F.<	B|a|LTOFA010003
M80B$ 6 6B.*	BHM BH6 F+5"FH8	BHMFFHN BHQCDA+	5BHQHBH9 DA+5FH8	BHQ<DA+5FHQ(DA+	5B+O"":aFA010004
M80CQ 6 AHBH	AFHE AG8BHEDDA+	5GH-SFHEIDA+5CH8	FHQADA+5 A+*BH¬	YGM/PBH¬;D F FHE	|BH8D¬QUFA010005
M80D+ 6 AEDA+	5FH8<DA+5BDI-BH8	BDA+5BHQIBH: DA+	5B+O"BaC"G<DADEA	HFDI_Fa AC*D&B-A	YB<I"N$<FA010006
M80ED 6 A%D A	HB;6 BH4HEUI1D B	BD," D DD ,="AZK	& :D FH-¬ MS& MS	& DTGB<; DDSGBH-	:DDS&KDaFA010007
M80E: F A=FH¬	" AHB&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 9ZMFA010008
M80< 6 D DME	&Ba*AB-D C_C&B+"	1BH< BF*H ?B:D	DAU&GGH&5CH ,CHD	ZFH--B' AF-D+F+N	#D WEQ3DFA010009
M80<6 6 DKG4&	MFH-&BH*CBI AZS	& Z-A ,-)B;4HD,"	D DDB D* ,=" AU	I AG4GU%TGHDCD G	DC4%W2ZOFA010010
M80(% 6 DUD G	HCH<BC.*.B++ FH-	-DDS&B;4H YM-DY*	- DQ D9EH DY D9I	HB+N"BHM BH< B+4	YF+¬R2LUFA010011
M80+S 6 D6F.<	BHa FHU FID F(H	H8I< FI& BH% FH	; DCFBaQQDME+DDE		AHBGH&"F<LOG*J	AC.=D11HFA010012
M80!Q 6 EHCH&	BB*LOC|"DCH<PG(*	PAN/&GE/JFa<AFa<	AG(*CF-EMB)/ F(/	CC¢SQOMSPDMCPC4C	QC_C&D.DFA010013
M80&+ 6 EEEM1	XCU1XA41XBH- BH:	AGHDCD GDB:5 BHE	DDA+5EFITF+6"DAU	HD 'DFHQ+FH8OD E	_BHQ!Q:YFA010014
M80JD 6 E%BH:	OF;O B(a¬GI8&BH-	F PN5FaT"D&E1 *	FB+N"BHT"EGN#FaT	"D&E7D *D UED E	a E'¬OMFA010015
M80J: F E= E	=D E"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 4A8FA010016
M80Q 6 H FHH	AGH&MB<&ACHM$CE&	FBHMAD5YHFH|MBHH	D H(BH<¬C<<EC*H	&G<<EC*HD8%."F%|	" 4&O¬CaFA010017
M80Q6 6 HK aP	% -HOFHO. HQBaN	=C*&&B%L"F%P"ENa	/GHQDGH*EBH& GHM	EF)aDD5YKB("#DZD	EBH H;RHFA010018
M80R% 6 HUAUB	BBHL)FHP9B%."F%|	"FH¬LFH$"C<*CG*Q	B DBD ZYEC_C&FNE	KANN)GNa4 5VS M.	FC4.G6#*FA010019
M80ES 6 H6A6R	LDMCCF4GDBUCEE*J	E &H'BHMA 4(AFaO	XC*&&D IEFaP2C*&	&G<MCC*&&C<*EG*Q	DD("-)TMFA010020
M80$Q 6 IH &I	|A)9)F&I|F%P"B%L	"G'8EG)4DBNILDMH	FG4HGC_C&BaHBDM.	DCM.EC<*EG*QDB-I	&F)<A3:4FA010021
M80*+ 6 IEFH$	)BH¬9 I&E6R, NI	KAN'UF)aDGNI2DEI	5D /OD("- &I,A)9	)F&I,BHL:F'9>G)4	DA4'>P *FA010022
M80)D 6 I%D_U	QF&IOD_UODEI1F)<	AC_C&FHQ BH* D H	7DA-$D I6 I7 I	8D I9D I: I#D I	a I':#aFA010023
M80): F I= I	=D I"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 490FA010024
M80U 6 < UB	)EDF; 4B¬ MFRDMB	EFUB$GH-MB<-AB4F	HA)5;F&<aAN3'FHH	H M.FDM.GC<*;C*Q	)F-<P7K&FA010025
M80U6 6 <KFI4	FI8>C(8GC)4FD <	aF_' D5Y$BaHBB_'	- M.FDM.GC<*;C*Q	)F-<,DNaTb_=- <	7FI4 #LOFA010026
M80V% 6 <UFI8	>D',%F-<YBI84C(8	GC)4F <EDNa?A5&	1 '?%D <OD',%B-<	7FH|"F'9"C)4CB-<	7F'8B"IUFA010027
M80W$ 6 <6D <	9FI8 FI4 UB) DF	;GU8¬C_C&BHT"FH¬	'BHQAB'86G)4GD-(	MFHM B'9.C)4F -(	&F'#=NS<FA010028
M80XQ 6 (HG)4	&D-(<FI8 D ((F'8	BCI4EF)a-D <9FaM	AF':3G)4H (IBHM	BB'9DG)4GF-(DB':	DG)4H:Z<FA010029
M80Y+ 6 (ED-(	)F)= <7B'8>G)4	&C_C&FH¬-EXNXBa-	AC**&B-(/FH&DD *	GF+7=FH-AF(G?B (	DG;7H2&MFA010030
M80ZD 6 (%DAO	F<X#FM'6 %9)B&(	3D%9*D&(6BH- BH*	KDAUHCHQ|GHM+F<R	Fa"AB-(a&*R A*	DD ('3C@FA010031
M80Z: F (=D (	= ("&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 4DYFA010032
M800 6 & F'-	A 'T4D&&FFI- F'*	AC)Q&D ; DALMF(	3D &VF+7=GHH5F &	<F(G?B;4AFNH1 (H	GB&&308QFA010033

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
M8006 6 &KB+'	D WEDD4PBH*UDD;	&GE<$ D4ED --F(| 3B'<DBHED AODA6H	VB%@AB_-ACH8|B+8	"BHE.'9%FA010034
M801% 6 &U AO	DB+' F+*AF||#FHQ	+8H9I YM-DY*-D9E	H DQ F(.8FH*H AJ	K (HG &&8GE<5D *	DBHK-'#%FA010035
M802S 6 &6B'<	DD **B+' FXM# AO	(CH<SD WEBVH"E6R	CDIMENIHCVIHG5I	HADI.BUIHBM(G 0	(DD(H;-4FA010036
M803Q 6 JHD4(	HD O|D /OEF)( )	.G6)HF+*ABF_J)	&B+' GO)E VJBUI	Q <<&F&JQ ODCVI	$C6'H¬1QFA010037
M804+ 6 JEF'X	"D(D|D&J¬FV(LB51	LF)DCDN(SB)DDA4'	UD &¬FN<QCV'ZFH-	(FH)FD@UHFH-+FIU	AGH&|O$QFA010038
M805D 6 J%A5'	#F)I&F<&"D@LZF&(	%GNJ4D@L'F&(%F'-	A @L5 &J9FI- B)*	AF2@A &/ 5TD J	@ J'"RDFA010039
M805; F J= J	=D J"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 5K-FA010040
M80@ 6 M U	U U U U	U U U U	U U U U	U U U U	U 8bDFA010041
M80@6 6 MKU	U U U U	U U U U	U U U U	U U U U	U 1BHFA010042
M80'% 6 MUU	U U U U	U U U U	U U U U	U U U U	U EBHFA010043
M80=S 6 M6U	U U U U	U U U U	U U U U	U U U U	U 'BQFA010044
M80"Q 6 NHU	U U U U	U U U U	U U U U	U U U U	U @B"FA010045
M81 + 6 NEU	U U U U	U U U U	U U U U	U U U U	U 'J%FA010046
M81AD 6 N%U	U U U U	U U U U	U U U U	U U U U	U KR%FA010047
M81A: F N=U	U &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 5R&FA010048
M81H 6 Q U	U U U U	U U U U	U U U U	U U U U	U 8RDFA010049
M81H6 6 QKU	U U U U	U U U U	U U U U	U U U U	U 1I-FA010050
M81I% 6 QUU	U U U U	U U U U	U U U U	U U U U	U EI-FA010051
M81HS 6 Q6U	U U U U	U U U U	U U U U	U U U U	U 'A-FA010052
M81.Q 6 RHU	U U U U	U U U U	U U U U	U U U U	U @AUFA010053
M81<+ 6 REU	U U U U	U U U U	U U U U	U U U U	U 'AUFA010054
M81(D 6 R%U	U U U U	U U U U	U U U U	U U U U	U KAUFA010055
M81(: F R=U	U &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 5AYFA010056
M81M 6 * FHE	EF;O FHT#DPMHB@-	AB-*CFH&ABH-KBH*	CDAUHB+N"C%THB<?	7 ;AC6QEF;@BBH8	RF>M&Q-MFA010057
M81M6 6 *KF>M	&CHH CP<E 5DEENH	EA5HRGE&EF;@&F;@	HG.QGCH*DEPM%CXM	- &HEPM%FXMWF *	SB *T;2OFA010058
M81N% 6 *UEXM	¬D O EPM%F@-FC**	&B-*)FH&8D *GFH	FHF FHH+BH;*E6Q	8EVH8 57 MCD8 *	4 MGE$,8FA010059
M81OS 6 *6F *	6 MC¬A6)CEXM¬A6)	CDXMSA6)CGGN BH-	SDA9DB@*AF-*8D *	DAGNIEXM¬DXMS8@*	AF-)C@Y*FA010060
M81PQ 6)HD *	DA6'(EF)(8H-/DA9	DD WEF+*ABF_KBH-	<D OHB+*1CH<KF<<	GF@(IA UCFHH+D .	EE6RO*SYFA010061
M81Q+ 6)EG%J	+G%N|E<&E8&)¬ 0	'CV'D NISD), (H	&D&JW NEX 5VXD)	@FH-(8H*FDAUH NI	@GEE@&E-FA010062
M81RD 6)%8NE	#CUFO MBPGDBQD'9	+DO)6D556FI8 FI4	D): E'3&'8_ -)	:8'7"DA4 F(G7DAJ	*)'QROFA010063
M81R: F)=)	=D)"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 5YOFA010064
M81- 6 - C&Q	DEV<HD HO A4¬DNH	5FNDGDEH%D(D| &-	.EV<J VJENHR A(	VD HOBEH&FN<KB5U	;DANHPJHFA010065
M81-6 6 -KEED	JANDJAD4PEM4QCU4	Q W) AM)FEH;FN<	KCN@;EVUMG5UMD W	1B&-UBH- BH*MF<X	?DAUH2&@FA010066
M81/% 6 -UDVH	YDEII W)DARKD X	&--A4Q- A4¬BHF	DADGFBUGGC%RGBJM	)ANHJFH EFHFED -	(CV@9&&MFA010067

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
M81SS 6 -6 5U	8GND9D)XENH#A4'	"D W1B&-"D HODAN	HBVIDFN(DD X D&-	JE4QJB_I D HOAND	JDVH,*-&FA010068
M81TQ 6 /HBEH	W -MDNILD(D|F&/	; N(&BNE&8'UAGNE	L NE_F(G#GN')BHF	DDDGFEURQG4R)F@Q	AGUFF'YUFA010069
M81U+ 6 /EFH	CF'HA - DAJ*AV(	3DV(SBI3" VJGO)	WCW)/F*_ VJB+'	F'3"F-//8'UAF)D	CDN(K=H%FA010070
M81VD 6 /%B)D	DENN7C5(3C4'4BH-	BH*JDAUHDA4	-B(|= JEAVV9E5V	>BH"DGDFRFH F(G	#F'HA*90FA010071
M81V: F /= -	AJ9&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA #,@FA010072
M81% 6 U AV<	BBNHC ANRG6QEDA4	"EVDBBEHH AM"DAR	QGHQED U<CHQ$GH*	;B%¬"C@*FbHEOF(.	#B(@¬9EYFA010073
M81%6 6 UKGI8	&G4UNF;@DG6QP A4	7FHQOB+"¬DAM2F;H	HB+P7GHSHB(L6CN@	SB)&ACIY&CI>&BHB	EDDCA7SMFA010074
M81_% 6 UUFH	E MCEDUC$ @G"F-U	_ &/OE(Y$ &/OG)L	AE(Y$DO/OD5%%C)L	GHM¬C%NNB<MCDMC	FG%RPKH FA010075
M81>S 6 U6G*N	F UGFC%ROG*NFDMC	FG%RQG*NF MGFC%R	RC*PFDMCEDDGFG4C	GC%NEG%RMC%)$F<Q	AG*NF8QDFA010076
M81?Q 6 VHG*P	GD)P - D U D /	H - D V+D UI U	. (D&B&VM |-DAO	BMVRF<W"GD_EBH<	D Z&=/OFA010077
M810+ 6 VEFHF	FDDGFBH& G@&*B%L	"C@QD -VVBH& FHM	FH-AD Y A: CU/	ZBHMAD Y F@MBC*&	&D Y &TUFA010078
M811D 6 V%DAG	FBH& A:5G.4EB+(	B.4 C4CEDDCD AG	HA%JBD&V9A%NCF&V	#FH-ZDA9DE UH AA	G Z"NH FA010079
M811: F V= Z	/ V"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 19 FA010080
M818 6 Y EUO	(AU%HBH*6G4UG 4&	G @P'B-Y.DA ¬B'	AB-YH 52BO<L Y	EAU%FA4/& W<KFH-	VDA9DPL&FA010081
M8186 6 YKDO<	NFH-WDA9DBH< AG	.DA:7DAC#D Z&BH<	DAC#BHDK MGF DG	GF%$"B%¬"C@*CG*Q	BCUOWRK-FA010082
M819% 6 YUG4O	WD Z.GU%?EVD?E5D	_G<M$C*&&C5&_B@&	AC<HEC*&&AU1AE%N	GB&Y=BEH4B445DA9	AG4U4M&QFA010083
M81:S 6 Y6F<X	=B)DBB¬+JB|+LFHD	B.D FH*7 A ;E%J	FD&Y2D Z&B%L"F$P	"C@*EG*QD -Z.F$$	"B$¬"'R%FA010084
M81#Q 6 ZHB@*	AG*Q& Z<B¬<BC.4	GB+(G.4F AG(FUV	/F<X¬GU_M A$ODA?	,BH B ?:BHFD UF	RDDF*=Y FA010085
M81@+ 6 ZEBNJ	* AP5F.DHD ??FHM	IBH/=D V% <U&B&Z	"F<X?ED_"DA?,A45	%AEE"ENE"BHMHF.D	GD Z83-HF&010086
M81'D 6 Z% (H	GB&Z6B)HHFH FHF	DC)DDG;BH E MB	)DDB;BHMDB.DCBH	B ?:FNJ@ AP5D ?	?BH/'3Q*FA010087
M81': F Z=D V	% % &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 'JUFA010088
M82D 6 % CDV	BF<X7AD_8GUOPAD*	F YEBH *FHD MC	AC.DADDCHF(L¬ ?	; AG.FH&ABHMAE4-	LBE&L5YUFA010089
M82D6 6 %KF@M	ADA:7GHQDGH*ED Z	.BH& BH- E44ZGU%	WAVEBG5DWGHMEB5Z	B _YAD&%UFH-BFHM	%6:B-FA010090
M82E% 6 %UF@P	= %6FHQ A: %	6 ZYFBH BBHFBFV&	?FHBBBHDC ?: AT	* ZYE (HG8&_B8H&	BHMG7B-FA010091
M82FS 6 %6G.D	EGHDDE4-=CU-@8HM	AD %=F@MBC*&& ?	; AG.DA:7DAC#CUV	)BH ODMCFG4CGDMB	& Db&8S%FA010092
M82GQ 6 _HFH	;DDCA8@D*DMGB MG	CDMGDDDGEC<MGG*&	FG*<&C*H&GVJOF@<	AC*H&C4FEG4FDC4F	CDDFB"#QFA010093
M82H+ 6 _EFDI	) AG4C*Z8D D¬E4/	> Z:F ,8 FEETD,8	BF.+& 9¬)GU/XB¬<	ABVJZB¬(DHV$FH*	4 A ;#EYFA010094
M82ID 6 _%B¬<	HFH<&C_C&BH< B.+	Z:ED,8BFNJ5B¬(	9¬)FHD BH*5 A	;C_C&DDCN8(M¬DMB	N@_C&&SMFA010095
M82I: F _= _	=D _"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 6D8FA010096
M82& 6 O B+"	7 AO(CH<SD WEFD<	<FH-.A6QHFH&H (H	GF&*GBH*EDAUHB#<	|BH-HD *HFH-&E6Q	+ <<&):MFA010097
M82&6 6 OKD&O	OAD<2CM<+B@-DF@-	O (HGB&ODGVH_C5H	/EM<¬FEH; 4 D 4	¬B@-AB)DAB@-A %/	ED&OVL.OFA010098
M82J% 6 OUB)D	BB@-AFEH,C44DF<X	7D O,F<X?FH*DDAU	H <<& &03AU<3E5H	3 |- &HFNHV8EH	V %4B&2 FA010099
M82KS 6 O6D&O	VF*6 F+*ADAO D ;	F(.8DA&6FH-E AG	4FH*¬DD¬FC*RB D:	FFH*GDAUHD JD|@	D|@J¬#8FA010100
M82LQ 6 1HD C	"DAD D Z:<D,9	ED9¬+F.< B;=HB.O	(F 1JF 1KF;MDF;M	&F+NDD 3:D 3:D 3	:D+*FOBMFA010101

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
M82M+ 6 1EF&1	-8H-YB+N BH@ F;*	EDA9DD 3:D 3:CO)	$CW)$FH-AB+'"B;*	DB;" D 3:F;M&F+N	DB+'";8QFA010102
M82ND 6 1%B;*	DB;" D 3:D 3:D 3	:CO)$EW)$C4/6BH-	D 1VBH@ F;*EFHN	AQ F;MBB 1#C_C	&D 1'MTHFA010103
M82N: F 1=D 1	= 1"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 424FA010104
M82* 6 4 B+'	F||#F;@AF+*AF+7	=B;@HFHQSFH8FFHQ	HF.RNB+"' ;AF;M	-B;4ABH* AXM/AGM	*A6*D'A-FA010105
M82*6 6 4KB@-	AC**&B-4|D *DF+*	AAGM*B@$"D&4|B+P	¬ 4| AO(D WEE6I	EFH/CD O,BH* A6*	DB@*A48MFA010106
M821% 6 4UB-4	XFH-TDA9DF;MBB+P	' 4S&+' B+P¬FHQ	DBH8BDAOCA6H2BH&	ED *&BH: DAOCCHM	S8H9)2 FA010107
M82;S 6 46DAO	CGH&SE*JEB&4OGHM	MB<HACH<$GH BGHD	CF@<GC*H&F%|"B%.	"C@<GG*HF -4¬F@<	AC*H&=.QFA010108
M82¬Q 6 5HD&5	+ 4&¬CH-DGH&EGHM	HD 5;FHC"F@¬9C*Q	FHDBFH G<DGC*	FBDR;B@*AG*Q&B-5	E 4J)OEHFA010109
M82-+ 6 5EGH	&CHD&CH&&GHM&D%4	CF&4¬BH/LBH*UDAU	HD'T5 &5>FI- F'*	AC)Q&FH CBHFB MB	PDDBQ"$ FA010110
M82/D 6 5%DDF	OD JXF'-ABH DDDB	QD JXDW(6BH< AG	. Y* YEDMC)F 5	8 MG; *3 5#D 5	@ 5'NKHFA010111
M82/: F 5= 5	=D 5"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 4Z%FA010112
M82Y 6 8 U	U U U U	U AG.BHQBB@<	C*H&FA|&D-8J8%Q	BF%|"B%."F@<AC*H	&CH&B7#UFA010113
M82Y6 6 8KCHM	CD #% AG(B%QBFHD	F.DHDZ:+ ,8 D9)	$B.<&BH*@ A ;B.4	IB+(B.4 B.<B AG	(DZY+)H4FA010114
M82Z% 6 8UFH*	ABHSADH¬B MTCD%.	" &90 %!" &9ODM¬	B MTCD%." &82 %|	"F&95E%I<D&91E%(	(D&91EK&FA010115
M82DS 6 86F+*	- WIHFH*ABHSA U;	& US&FHD B.D DZ:	+D,8A 9¬)F.+&FH*	' A ;AURHF@P=C*&	&F@L"2KHFA010116
M82,Q 6 9HG<M	FC*&&D #% AG(FH<	CDM| M|BDD|DBH+	C M|A M|HG%)GCUE	OF*; C4EQF*) FMI	EF**-PEDFA010117
M82%+ 6 9EF<G	@B<.'B4A;D 9UF4E	SGH AF**&D 9UGH	BB**QFHM G< F4A	ZF@MA 9VC*)E ZY	EDAUH=.*FA010118
M82_D 6 9%G.4	EB+(C.4DG.+FF**	-D #% AG(ZYE AD	H ZYED #% AG(B++	GH 7D 99 9#D 9	@ 9'D <FA010119
M82_: F 9= 9	=D 9"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 4RUFA010120
M824 6 @ <0	G &@CBH%IBH-@GDO	GF@ AF@-SBH&;DDK	HF@-QDMT+D4T|B;4	ACI-5 AGBCI*S8HE	DDA+5¬KYFA010121
M8246 6 @KGOH	M AAW8H8H AG4FH*	¬DD¬FF@TXEUODG40	D %4& &@SF)+ E<(	"F&'8FH%&D '8D%4	ED&@D6,8FA010122
M825% 6 @UA<R	BD&@Z MS(DS<D '	8D D¬A<RBF&@0C4%	ZF44ZC%RB D;F MS	(DS<FH&G (T? &*	GF5*92IHFA010123
M8265 6 @6BH&	FD_*G &*GAFIF AG	4E<ZC &'AFH-NG*Z	CFH*ADAUHB;5 DA+	5CFI8F+6"D @KADI	HG6IHJQ&FA010124
M827Q 6 'HBH&	ID *GD>HHF&'+FH-	ND *HA<IHB&'MC%Z	BDH/-BH*$DAUHA<I	"F&'RA4_¬BH-XDA9	DG4_¬N2@FA010125
M828+ 6 'EFH*	-G4¬FA<RBDJO; '	PFHQDB8H8&DA+5BH&	HA%(S &*GFHE|8H:	CDA+5CFI=B)D-AOI	#E6I#6/<FA010126
M829D 6 '%FH'	/DDCABDE2AWI7B)&	DD '7GWI#BH-:DDT	EE<NCD&'9B+76 A	BH-C ADDBH-;FH*	A E¬NS<FA010127
M829: F '= E	E '"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA '$4FA010128
M83 6 A F%|	"B%."G<RB D;FC<Z	CB<[OC|'C <OGBJ	H AG.G4<(B)&-B*U	AFH KDMBB MBCDE(	VDAGF:I%FA010129
M83 6 6 A KDMB	BDDBCF.< Z:ED,8	AG4<EB)J B¬(D9)	$FHD F.DHFH*=FH<	&DW<%BA -FA /FA	SBA T¬A<FA010130
M83A% 6 A UB'	AF/ ¬DE<Y Y& 88	H :- BH@ A ,FIC	=B' AB/ _FE<1DO%	YG_A&BH< AA GD _	>D _9M2MFA010131
M83BS 6 A 6 Y	. YEDAENDA5VDA5	7DA51 8; 9DBH	ABHFA DB+ DF|BNJ	C APOFHMIFH/2D V	%BH B¬S-FA010132
M83CQ 6 AAH8HF	DD4CNDMGR MCE MG	CGMC$CDG*D5VLBIO	FHFFGDF* <|= JA	SG4(QB)&A AAE 5_	EB)&H@TQFA010133
M83D+ 6 AAEGH&	$G<&EG*<& <|=BJA	-B)&BC4(TB4JTB)&	BGU1V ASPDAD B%.	"G<Z8G<RB D;FCH8	&GH@&"BDFA010134
M83ED 6 AA%FHQ	: D$ G*ACODE B;4	-FHE|8H8DDA+5 AG	RD@DEDDSB ZYEBHE	DDA+5D @MF.4AB+(	8.4 7T<FA010135

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
M83E: F AA=F||	'DAE(&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA #0<FA010136
M83< 6 AD <7	OFJDFF(.7FH-ABH*	DAUHFW*H 8FAUO	XE4OJF(.7 44+ AS	PDA*H @7"FJ* AD	B @76'A4FA010137
M83<6 6 ADKD/D	B %4GBJDDF(.7A44	Q ASPBH*$G<*(EAD	G A&(DA& A&8 AD	VDA&U A)Y ADBDA)	% A&G#TDFA010138
M83(% 6 ADU A&	B ASPDA&;A4O=ED4	8AM44AU4?A44>F(.	7 AO DAORF(.7A44	3DA?ODAO1 AOCGU4	BE44B$QQFA010139
M83+S 6 AD6F(.	7 AO,AM4BAU4BE44	'F(.7DA9.DAORF(.	7ED5CAM4BE44BD 1	.GM4BAU4BD 1.B.4	B+(P84FA010140
M83|Q 6 AEHF||	?B¬<BDAE+B.4 B+(	B¬<&B¬<-B¬<AFHD	8.D FH*8F|(" A	;GH<#B+(CHH#C_C	&BH& 3,%FA010141
M83&+ 6 AE&FHM	FHQ BH* FH BHD	BHH GQ+BGH&<GHO	#B+(CH4#AU1%C41	%F)+ %4.BJE3 %4	(BJE3#J4FA010142
M83JD 6 AE%C%J	<B<L8BJEOF(.7B*W	B((*B+*FC_C&FHH	DED17G<HBGQ+BB+O	"F;N FHECCH8 A<	5DAE'4L<FA010143
M83J: F AE=DAE	= AE"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA N14FA010144
M83Q 6 AH DV	=DF(' A?.BH AFHE	AG8 :D B:DDGU&	NF: D :& FHM/ DP	FF<E C*JF DODBU&	NDZ& 1QDFA010145
M83Q6 6 AHKD,&	?DYF"DAHMBH8HBHE	DDA+5A<EHFJH"CFH	9C%ZAGH&"F<LOG%J	AG.@DAWH:GOH9 A+	*B@CCCL%FA010146
M83R% 6 AHUBH*	HDHE&F@¬"DJHVGQH	AB%."G<ZBFH*¬DD¬	FG<RB D;FBH*:DD¬	FC*RA D;FB;4-E6I	NFHE|*&&FA010147
M83ES 6 AH66H8	DDA+5DAH:E6INB+O	"B@C"G<DA JHEDAH	A<E"DJH-AFH-DF<	:FH-¬ DTDE<JABJI	IFH>I9&YFA010148
M83$Q 6 AIH AI	<D GDF*> C*ZAFH-	NFH*A A+*FHM;DDO	FB@QQ M$+ D$|DAU	HFH-¬ DTDE<EDFJH	: 0I90I FA010149
M83*+ 6 AIE WI	9GQHA DVVCH&BB*L	ODF('G|'DBF(%FH-	-DDSBDAI% AG4E%E	C JID <OGFJI%GQH	AD GHM3DFA010150
M83)D 6 AI%CH<	BBH-S DTDG%JBDDS	DFH-¬ DTDG%JADDS	DFHE|BH8DDA+5DAH	:BH>ABH-$FH*GDAI	+ A<|$KHFA010151
M83): F AI= A<	K AI"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA =ZYFA010152
M83U 6 A< FH-	¬ DTDG*JBG%JA MS	DBDUGDA<-BF<HDAG	/FE<-D GHFF<+FH-	-DDSB A<>DAG/BE<	K A<9*D-FA010153
M83U6 6 A<K AG	4FH-¬ DTDA<JCDJH	BF<V"B+D"FH BH%	QD @ FHQ@ DD¬BHR	;C_C& AG4E%ECDJ<	>FH*H&--FA010154
M83V% 6 A<U <O	GBJ<XF**&F<V"D G	DD GHCH<BC.*GB++	DA<2GQHAD GHD G	DCH<BB+D"DE<J AH	BF;O =LHFA010155
M83W5 6 A<6F'	OB/<6DAM(EM5E AG	.G4<'B)&-FH KDMB	B MBC8H-: DTDFHM	FVJEBHO ZYF DO	DF@O 2:@FA010156
M83XQ 6 A(HG*M	& DO& ZYEBH- FHD	B.D BH& BHMB ?	; AG.DA:7DAC@B++	FID FI& BH< F.<	AHB6H8FA010157
M83Y+ 6 A(EBH*	:DD¬F AG4F%|"C<R	C J(/F+7¬ D;FB++	B((" AHBFH C8HF	BGHM¬C%NNb<MCDMC	FG%RP=1&FA010158
M83ZD 6 A(%G*N	FD4GFC%ROG*NFDMC	FG%RQG*NFF&-(BEI	9CD59BH- BH*MDAU	HD /ODA(: A(#DA(	@ A('L/&FA010159
M83Z: F A(= A(	=DA("&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA NEUFA010160
M830 6 A& DA?	ODA&CDA?3D ; F)F	HF*UQ AJIDA?3G_V	RD ; F)DCF*UYDAJ	HGHQ*CV&&DA-$ A:	B*V =8QFA010161
M8306 6 A&KAU-	* V&OE4MP A&*A4M	*FHC"G<M G*& G.D	EGHDDF<-C ?;F)D	CDA?>D ; B*U-B)(	- AJ PY4FA010162
M831% 6 A&UAV&	|CNMXC5&|DA?OD ;	D H FHBH DBRF*U	HF)EGF). D5U3F_D	<F(H"DA&6F'X"CNM	6F(X@JQQFA010163
M832S 6 A&6DAL	MDA1HDA?>D ; B*U	EF)DCF). FH U DB	&DA&6B)H F)IDDAL	MB*UBFH9'8H*<DAJ	(B)D.E&DFA010164
M833Q 6 AJH8*U	BB)H DALMBH9IFH*	HFHQ+F||¬FH FHF	B;4ABHK- *<B'	AB/JPD *DGGNMF;M	HB+P7#HDFA010165
M834+ 6 AJE8*U	DC_C&B+' F||#BE'	- GYFHQ+BH9)A5I	UBH9_D9EH EE2BNI	1FH UDDCDB@&AFD5	OB@L=1BYFA010166
M835D 6 AJ% 4J	O GY DBDDAJD DB	DDA4|D9IH YN DY)	DY BVJ8F;@DDA4	KFH EFHFED HODAN	HDAJ'7:MFA010167
M835: F AJ=DAJ	= AJ"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA NKDFA010168
M832 6 AM BHQ	EFH8 A<5F;MAF;D	BIC:B' AF/M.B+N	"BH&CD *G&PMFCGM	FF;M&F+N?CHH FOQ	$AOQO*HHFA010169

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
M83@6 6 AMKGH&	>FH$?FH8E AMCE>I	DBJM$BH-PGH8DD *	HB+N>C_C&F(G'B+'	F(.8B)HB YN DY)	G4UVEZ&FA010170
M83'% 6 AMUF;@	DD44XB¬<DD9IH85Y	"CH*EBN@1F58OBH$	-GH*;B)HDDAM2 G	YFHR-FHHO M.CC4.	D <¬"#0@FA010171
M83=S 6 AM6 JM	8F@<AG<&GG*<&8/M	@B)&BDMHCDDHD A4	7F(G=F)HCGEJCBI%	AGH*$G4VFF;@DBV@	1F54,52%FA010172
M83"Q 6 ANHB'7	"DAM1FH E MCGF(.	8B4)EB)HBBN'J G	YB+' F||#F;@AFHQ	+GH8GB+8|B;8- A4	'FH F5.@FA010173
M84 + 6 ANEFHF	EG4CGB4GFD@$" 1N	ZAVID 4)Y 4RTFH*	AF)HCBV'JF55&B'7	'DANJF4RTD /0 DC	EE<MGQY%FA010174
M84AD 6 AN% 1N	Z /NY 4RZ AN-BH	A 8Q<DZDEC4CJDAN	9FH 8Q<DZDEDMC	JFHF DGR DBR DF	J ZYE2:4FA010175
M84A: F AN=D8Q	HC_C&&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA P8*FA010176
M84H 6 AQ FH-	DF.G=FHD A7NAD4	<CHHHBH& BHP=BH/	%DA9*GU5< AR.DAC	#FH&ABHMADA:7 ZY	FFHF 19DFA010177
M84H6 6 AQKBHH	FHM BH- V&WFH	DAES 4Q$8)K AQ	: 4D¬F4*4FH-A AR	AD4*PFHP" AQ:DMC	FDMGG9O*FA010178
M84I% 6 AQUF@Q	AC@;&BH ADAESD4*	,B@C" AQ9 %BADJQ	6FH DMCFF@CA 4Q	)FHHAB)K F||'FH-	B ARA6L8FA010179
M84HS 6 AQ@ 4Q	XBHMAB)K FHHAFHK	F%C"C@& G<&DG<H	DC<MDB¬<BC.4BB+(	B.4 AG(ZYEBH	* MBEEHUFA010180
M84.Q 6 ARH DB	HB*UHC45<F;' DA?	>D ; F*USF)DCB)(	-DAJAF(G'B+' F(.	8B)HBF5ZQDANHF(G	=B+' ;-DFA010181
M84<+ 6 AREF)H	CGEJ)DANS YN DY)	D9¬+F<X=FVJUF;@	DB*UA ,8 F;= GH*	$FV'DB55,B'7"DAM	1D59>¬2MFA010182
M84(D 6 AR% G	YDAM1F;@-DAM%BHF	BFH C MFO UF& MB	P MBQDMBEDDB$G5J	@BHMA DFEC_C&DDF	&C_C&)SMFA010183
M84(: F AR= AR	=DAR"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA PI4FA010184
M84M 6 A* B<?	7BH8BFHM FHQ BH-	QDMSE DSFD>8BDJ*	+ A*2B<?7BH-Q MT	EDDTFBH& BH* BMQ	KB@&AO-8FA010185
M84M6 6 A*KBM@	MB@*AF%P"B%L"C<M	+C*&G /*)B%L"F%P	"B*E A*-F@MAC*&	&F<Q¬B<E¬C4&TB*R	CH8F7Y@FA010186
M84N% 6 A*UBH$	, AODCH8EFHE<' AO	DFHE|FH8IDAOCA>I	EBJ*18H-QCH8ED *	HBH8HFHE| AODBH&	; DLHKK@FA010187
M84OS 6 A*6B@¬	E MS+AMS|BH*QDM¬	+DD¬|BHED AODA6I	/AWID <OG J)DBH&	ID *GDMTDG4TEF@M	AC*&&#R4FA010188
M84PQ 6 A)H8DJ	. AG4C*ZB MSD DS	E <OGBJ)/BHG5BHE	D AODA6IQF@ AC*D	&B/)JFH-*D *H8OI	* AG4LL&FA010189
M84Q+ 6 A)EGHD	C AI:DWIRFHE|BH8	DDA+5 & B<?= AG	4FH-- DTDC*JCDDS	DD D¬B<?7BH/-BH*	$ AUHN9-FA010190
M84RD 6 A)%BH¬	YBH&;DDLFGH&FGD_	=D F GEI6F@$= ME	) ME;F@$DFHE|BH:	CDA+5CH SF< GDDE	AV4',MFA010191
M84R: F A)=DA-	A)"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA Q#QFA010192
M84- 6 A- B<?	7FHPYFH BV&FF@B	G* & ZYE MLF ZY	FDDBFF@MAB/-D ZY	EBH- FHD F.DDBH&	FHMQ2 8FA010193
M84-6 6 A-K ?	; AG.DA:7DAC#D D	¬DMGBG4GCD4H$F4<	)FH-D ADD MCBC4C	CD@H?GN&S @.;F/-	, J-$OD8FA010194
M84/% 6 A-UBH-	/ DTH M-, @|8CN&	DDa|> /-$ @|% /-	$FI* B'*_Fa.H /-	>F'¬#F@HFB/-1G<H	BG<HB'K-FA010195
M84SS 6 A-6GI-	BG<HBG<HBC<HQC<<	BFIT"F'-AF@|4 /-	@B@<<G<<CBIQ G(*	PC)Q&G(*QC)Q&CI-	CC5RI"EHFA010196
M84TQ 6 A/HB*(	BH-QDMSP DSCG(*	PC)QOF'T4D//KB'-	< A/MF'*AC)Q&C4'	OF'-ADDFO MBPG4B	QCNJ$82-FA010197
M84U+ 6 A/E E	.C_C& DGDDMCEC4C	CFHQ BHH GUJUBHH	RFHQ<C4JXFHI<BHQ	&F@HIB@PSD//X@B.	'B@MH$.<FA010198
M84VD 6 A/%F//	DG<MEG<QEG<MEG<Q	EGD(3F@QDCM(5F@Q	BGU(7F@QAF@."B@H	AF@$% //8B@QMDDF	&DMBB4/QFA010199
M84V: F A/=G4B	FC)C&&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA E-%FA010200
M84Z 6 AU A%	Z AYYDA%Q AUCDA%	DAZ3 A%¬DAUGEU%	F*%BF+N=G_A& 8$	< AGR 8Q<B+"7CI-	CIUAJ2UFA010201
M84%6 6 AUKCIY	DCI%EBIO CI4>CI8	SCI@WB(=|DAG)GI*	HCQQGB<*GFH-AB@*	AAD*SG<-H AU;A4Q	VCIOH"8-FA010202
M84_% 6 AUUDAU	Z DQYGIDHDAU?GIH	HCDQ,8)DBGMQ_8)D	ACUQ?@)I D8QH (D	&BJU3 |-DAO 8Q	<CHH+6, FA010203

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
M84>S 6 AU6CHQ	|DAXRCIMBGIQFFHE	|BH:CDA+5CH SF<	GG)I FH ;DDCHB@-	DG4TMGMTLDZDECI	*DDS&O-<FA010204
M847Q 6 AVH AG	RB@-H DS B@-HFDS	ZYEG5AOF@-KDMT	BG4TFF@T>DAXRGI4	BCI8FGQ PF< GEAU	D8CH534FA010205
M840+ 6 AVEANJ	W 8Q<CHMFB<Q"F@$	4C*HBF/VSB*M-F<P	-FDRVB@Q<C*$EGHM	B 8Q<BH."BMR%FHI	MF@MA4T*FA010206
M841D 6 AV%B@H	AF@P'D/V%B@MCG<M	EG<MEB<Q|C<EEEFI	8B@$"BH BDDE DA-	DAV9DAV: AV$DAV	@ AV'J3YFA010207
M841: F AV= AV	=DAV"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA NAHFA010208
M848 6 AY E-	ID5H&DN-KANYN V-	E (-& JYWFIQRC)¬	PFIEJCI*MB(¬@ JY	HFIEKF(G=GI;JBIE	&GI;KP2%FA010209
M8486 6 AYKFIQ	&B(&CGI;MBIQJFI¬	" EYHB(ZOCI;EGI*	&B(*|BIQK E HFIQ	NDN HFIQODV HFIQ	LBI*A$84FA010210
M849% 6 AYU E	HCR;PBIQMCI;*CH&	EBHEDDA+5CI-SFHE	|BH:CDA+5GIUSBH9	CDA+5GIYSBH8TDA+	5CI%S4:8FA010211
M84:S 6 AY6BH8	.DA+5GIOSDZDEFDS	Q ZYEFIH D_*EDJZ	GBH ADDCBFHB@DMC	FDAXRGI&BGIMF AZ	&FHEI1HYFA010212
M84#Q 6 AZHDA+	5CI&SB(&CFHQDBH8	ADA+5G)JSBIM FHQ	DBH8BDA+5CIDSFHE	|FH8CDA+5GI<SBH8	LDA+5OQ&FA010213
M84@+ 6 AZEGI	SB(<DCMV;F)+ _*	K JZ/GIHDDAD FVA	?FH&AA4SD DTD %&	NDJZZFH&&FMSD AG	4FH*¬6ZDFA010214
M84'D 6 AZ%DD¬	FC*RB D;FB@-&DZD	EDDS& A%ZBH D MC	* DC)B@-H MS*DMS	)DMSQ MSR MSEDUS	$ A%DR$ FA010215
M84': F AZ= AZ	=DAZ"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA NROFA010216
M85D 6 A% B@-	+FH)I MSG DSP8@T	1GHHPD8QHFHBBFH<	ED%IA J%|FED|FH<	FBV&|FH CB@H-D/%	ZEZYCP9HFA010217
M85D6 6 A%KDDC	G ZYE MSGF@B G*	&DA%|GI%TGIOXDZD	E DSQGI8?GI@3DA%	XDZDEF@-MDDTMADS	DDDT;J9%FA010218
M85E% 6 A%U DS	FF@TY DSMB@-H DS	;D8QH ZYEBH8DFHE	|DA+5FH8<DA+5BH:	BHQIDA+5B;6 F+5	*DD%@=D&FA010219
M85FS 6 A%6GU%	#GUO:C4O:F<X7 V	JDA)%FH ;DDCHFHD	&DD/AFHE AU/CG<D	AGQHAD GDG4_H8H%	A< @1 FA010220
M85GQ 6 A_HBH%	B+O" AHBFH S MC	AG4CBCH<"D<<|FJ_	TF*|OG<EC <D|FJ_	V8@D&C*H&B/_YGQD	AFHC"N.8FA010221
M85H+ 6 A_ECH-	AF@ AG<-HB/_$ AG	8BH>AFH-*BH*CDAI	+BHD A_XB<<|GHD	CBHH DMBAC4BBC_C	&FH CR3<FA010222
M85ID 6 A_%BHF	BDA/* 'XXD/_3F<"	=F(T= A_5B*@AB)-	ABH DDDCBF*HAA5/	:B<.= DBBGI |B(	¬BH$,=I<FA010223
M85I: F A_=GH8	& AMC&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA LYDFA010224
M85& 6 AO GHQ	*B*V DAODGHQ&FVD	2CV&GDA-$DA?>D ;	A: A44<F<-CCHH	H A7NG44JBH/DDA9	*DALMQI*FA010225
M85&6 6 AOKB)H	-F)DCB*U-D9.+B)(	-F)IDDAJDBH-/ DT	HED-VED4-C4@/FH-	B ADDC4@;D(P- JO	%CEH;5 *FA010226
M85J% 6 AOUDAO	%FH-E MS&DDS&AD4	,DA?ODAO%DA?3FHB	DDUB& DB&BIU BIO	CVD5BH- FH; DAU	HAV&F4D&FA010227
M85KS 6 AO6B(P	TGHQ&D ; A: CHH	H A7NFH/,DA9*D H	DALMB)H-D9.+A45	LEM5LF)EG&*U-F5V	JF)<-:#-FA010228
M85LQ 6 A1HB)I	F'X"B;4A |-BHE	D AODE6I& |-DAJ	.F_D<DAJ.F)E.C45	KBH EDMC) DC;CI@	NF(@C7C%FA010229
M85M+ 6 A1EFEN	;FI4 BI9> A1VBNN	SFI4 BI#H A1VFVN	VBI4AFI8)FH FHF	MB)DMF;DMB+C4F	|BH9I& OFA010230
M85ND 6 A1%A)5	;FJ19BH."D'9(A)4	BD/14FH#IDA19BH|	=D'#9E)4C /19F)=	GUB¬FH*HB)D&D9G	+LHQ|=1YFA010231
M85N: F A1=DAJ	+DA1"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA RYOFA010232
M85* 6 A4 B(G	3B+' DEHOBE@E G	,B(@¬ + BHQ|BH9	)A5H.BH9_GV<(FH9	'D9G+B)D& YM-DY*	- DQ 12-FA010233
M85*6 6 A4KBH*	<F'HAFHL= *<BE@	Q GYB(@¬ + FH8	)E5H)FH8_F;@ADA4	KF(G'F+"OF(.8B)H	8 YN ;/%FA010234
M851% 6 A4UDY)	F44% DY F<X=FV&	?B*UAF;@D A4?C4U	>F;@DB¬<DD9.+B5Y	"CH*EFN@5 59& G	,BHQ-E 4FA010235
M85;S 6 A46BHQ	|GH8GB+8|G;9FF;O	C4*'B%UAF@¬"DA4	MF(G=F)HCGEJIDNE	DDANS YM-DY*-DDQ	#FH*A;8&FA010236
M85¬Q 6 A5H A5	HGH*$G4V<F;@DFV@	5F543B'7"DA45BHQ	|BH$-GH*;B)HD A4	7A4/= Z:FD,9"B.<	&D9)$'&YFA010237

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
M85-+ 6 A5ECU/	*B¬<AFVJSB¬(GM/	SF|+"B¬<AB.D MV	@BH*9 A ;BVJ=CM/	=GHQ#F||'F.4AB+(	B.4 89HFA010238
M85/D 6 A5%F¬<	/FHD B.D FH*# A	;B.<&FHD F.G' ,8	BH*: A ; ZYFBHB	DDBF ZYEDA5=B¬<	HFH<&&Z%FA010239
M85/: F A5=C_C	& A5"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 4:%FA010240
M85V 6 A8 BHH	C5&CFHHACH<$EUO	GGE&GBH<AGHMEG<<	EC*H&CHMCCH&BBH-	F4Q; %$"DJ8NC4&	NBHL"7EDFA010241
M85Y6 6 A8KBHP	=FH-HDA8OFH*AA<R	GBJ8EG<MCC*&BG<<	CC*HBG<*GB/8OD4&	X 4MSFH-ADA8OD%M	A J8_7TOFA010242
M85Z% 6 A8UFH-	BFHM DA8O @L"DJ8	% 4M_FH-DDA8_FH-	HF@P= /8OF@L"D+<	&DJ84GHDDG.DEC_C	&FH MMZUFA010243
M85DS 6 A86 A8	#FH KB@P"D/8#F@L	"DMCFDDCGC<*EG*Q	DE%IFFJ9HFE(C A	YBH-UGH&5CH ,CHD	ZD *HL$MFA010244
M85,Q 6 A9HE%(	G J9AC_C&DA?ODVE	+DAO2 5ZJEVJJA5J	KDA-$AVVJC5VJGV1	JC51JGHQ&D ; A:	CHHH#OUFA010245
M85%+ 6 A9E A7	NFH/_E4I;CUI-BHM	A A9SF@MBC*&& AG	.DA:7G.4EB+(C.4	DB¬<B AG(EA8H AO	JDAO=*2<FA010246
M85_D 6 A9% AQ	HF)MDDALMB)H-D9.	+F)EGB*U-F)<-F'X	"B)I DA1HDA97DA9	8 A99 A9:DA9# A9	@DA9';&-FA010247
M85_: F A9=DA9	= A9"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA MRHFA010248
M1MA &DA &DA &DA	&DA &DA &DA &DA	&IH=P49 &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA *L@FA010249
E"#!*E7*=¬DC"PH$	="7M&F| | C	F% ASC R A	SO Q	13020630751	21075=YYFA010999

LAST PAGE

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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                         2       OPTION    XREF
                         3       PRINT     GEN
                         4       RELIN     PN=4247635
                         5       RELIN     EC=827785
0000                     6       ORG       X'0000'
                         7       COPY      EQUATES
                         8 *
                         9 *       EXTERNAL REGISTER ASSIGNMENT -- SENSE TYPE
                        10 *
0035                    11 FTI       DER   21         FILE TAG IN
002B                    12 HES       DER   11         HARDWARE ERROR SENSE
0029                    13 ADS       DER    9         ADAPTOR DIAGNOSTIC SENSE
0022                    14 FBI       DER    2         FILE BUS IN
0038                    15 CO2       DER   27         CHANNEL OUT REGISTER_2
                        16 *
                        17 *       EXTERNAL REGISTER ASSIGNMENT -- CONTROL TYPE
                        18 *
0033                    19 DXC       DER   19         DATA TRANSFER CONTROLS
0025                    20 FTG       DER    5         FILE TAG GATE
002D                    21 FTR       DER   13         FILE TRAP RESET
002F                    22 SCN       DER   15         SCAN OP CONTROLS
0027                    23 FHF       DER    7         FILE HARDWARE FLAGS
0023                    24 DST       DER    3         DEVICE STATUS
002E                    25 FBO       DER   14         FILE BUS OUT
0026                    26 FTO       DER    6         FILE TAG OUT
0036                    27 FCT       DER   22         FILE BYTE COUNTER
0021                    28 CCH       DER    1         CHANNEL BUFFER COUNTER HI
0031                    29 CCL       DER   17         CHANNEL BUFFER COUNTER LOW
003F                    30 SBO       DER   31         SENSE BYTE 0
0037                    31 SB1       DER   23         SENSE BYTE 1
003D                    32 BOO       DER   29         CHANNEL IN REG_0
002A                    33 FI1       DER   10         FILE IN REG_1
                        34 *
                        35 *       LOCAL REGISTER ASSIGNMENT
                        36 *
0000                    37 L0        DLR    0<0>      WORK REGISTER
0001                    38 L1        DLR    1<0>      WORK REGISTER
0002                    39 L2        DLR    2<0>      WORK REGISTER
0003                    40 L3        DLR    3<0>      WORK REGISTER
0004                    41 L4        DLR    4<0>      WORK REGISTER
0005                    42 L5        DLR    5<0>      WORK REGISTER
0006                    43 L6        DLR    6<0>      WORK REGISTER
0007                    44 L7        DLR    7<0>      WORK REGISTER
0008                    45 L8        DLR    8<0>      WORK REGISTER
0009                    46 GEN1      DLR    9<0>      GENERAL MARKS REG_1
000A                    47 UNCK      DLR   10<0>      UNIT CHECK MARKS
000B                    48 STAT      DLR   11<0>      STATUS BYTE
000C                    49 QBYT      DLR   12<0>      Q-BYTE
000D                    50 RBYT      DLR   13<0>      R-BYTE
000E                    51 PAC       DLR   14<0>      PHYSICAL ADDR HIGH
000F                    52 PAH       DLR   15<0>      PHYSICAL ADDR LOW
                        53 *
                        54 *
0010                    55 ZER       DLR    0<1>      WORK REGISTER CONTAINS ZERO
0011                    56 CEB1      DLR    1<1>      COMMAND XEQ BYTE 1
0012                    57 CEB2      DLR    2<1>      COMMAND XEQ BYTE 2
0013                    58 MSC1      DLR    3<1>      MISC UPGM MARKS REG_1
0014                    59 MSC2      DLR    4<1>      MISC UPGM MARKS REG_2
0015                    60 FLAG      DLR    5<1>      FLAG BYTE--FROM DDCF
0016                    61 CHI       DLR    6<1>      CYLINDER HIGH--FROM DDCF (3340)
0017                    62 CLO       DLR    7<1>      CYLINDER LOW--FROM DDCF (3340)
0018                    63 HEAD      DLR    8<1>      HEAD LOW--FROM DDCF (3340)
0019                    64 REC       DLR    9<1>      RECORD NUMBER--FROM DDCF
001A                    65 KCNT      DLR   10<1>      KEY LENGTH--FROM DDCF
001B                    66 DCNT      DLR   11<1>      DATA LENGTH LOW--FROM DDCF
001C                    67 NREC      DLR   12<1>      NUMBER OF RECORD--FROM DDCF
001D                    68 SDH       DLR   13<1>      SKIP DISPLACEMENT HIGH
001E                    69 SDL       DLR   14<1>      SKIP DISPLACEMENT LOW
001F                    70 FFLG      DLR   15<1>      FLAG BYTE--FROM FILE
                        71 *
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0010                    72 W0        DLR    0<1>      WORK REGISTER 0
0011                    73 W1        DLR    1<1>      WORK REGISTER 1
0012                    74 W2        DLR    2<1>      WORK REGISTER 2
0013                    75 W3        DLR    3<1>      WORK REGISTER 3
0014                    76 W4        DLR    4<1>      WORK REGISTER 4
0015                    77 W5        DLR    5<1>      WORK REGISTER 5
0016                    78 W6        DLR    6<1>      WORK REGISTER 6
0017                    79 W7        DLR    7<1>      WORK REGISTER 7
0018                    80 W8        DLR    8<1>      WORK REGISTER 8
0019                    81 W9        DLR    9<1>      WORK REGISTER 9
001A                    82 W10       DLR   10<1>      WORK REGISTER 10
001B                    83 W11       DLR   11<1>      WORK REGISTER 11
001C                    84 W12       DLR   12<1>      WORK REGISTER 12
001D                    85 W13       DLR   13<1>      WORK REGISTER 13
001E                    86 W14       DLR   14<1>      WORK REGISTER 14
001F                    87 W15       DLR   15<1>      WORK REGISTER 15
                        88 *
                        89 *       EXTERNAL REGISTER        FTO
                        90 *
0001                    91 SETUNSUP  EQU   X'01'       SET UNSUPPRESSIBLE REG
0082                    92 POLLDEV   EQU   X'82'       POLL DEVICE
0002                    93 POLLCNTL  EQU   X'02'       POLL CONTROLLER
0083                    94 SELDEV    EQU   X'83'       SELECT DEVICE
0003                    95 SELCNTL   EQU   X'03'       SELECT CONTROLLER
0084                    96 RDSTATUS  EQU   X'84'       READ STATUS
0085                    97 SETRDWR   EQU   X'85'       SET READ/WRITE
0004                    98 RDERROR   EQU   X'04'       READ ERROR BYTES
0005                    99 RSTRDWR   EQU   X'05'       RESET READ/WRITE
0008                   100 ECCCNTL   EQU   X'08'       ECC CONTROL
0009                   101 XMITCNTL  EQU   X'09'       TRANSMIT CONTROL
000A                   102 RDCNTL    EQU   X'0A'       READ CONTROL
000C                   103 DISPCEHI  EQU   X'0C'       DISPLAY CE LAMPS HIGH
000D                   104 DISPCELO  EQU   X'0D'       DISPLAY CE LAMPS LOW
000E                   105 READOP    EQU   X'0E'       READ OP
000F                   106 WRITEOP   EQU   X'0F'       WRITE OP
0089                   107 SNSINFC   EQU   X'89'       SENSE INTERFACE
008A                   108 DIAGSET   EQU   X'8A'       DIAGNOSTIC SET
008B                   109 SETHAR    EQU   X'8B'       SET HAR REG
008C                   110 SETDIFF   EQU   X'8C'       SET DIFFERENCE REG
008F                   111 CONTROL   EQU   X'8F'       CONTROL TAGS
                       112 *
                       113 *       EXTERNAL REGISTER        FBO--UNDER RD ERROR BYTES TAG
                       114 *
0080                   115 ECCLOW    EQU   X'80'       READ ECC LOW
0040                   116 ECCHI     EQU   X'40'       READ ECC HIGH
0010                   117 PHYADDR   EQU   X'10'       READ PHYSICAL ADDRESS
0002                   118 CTLRERR1  EQU   X'02'       READ CONTROLLER ERROR BYTE 1
0001                   119 CTLRERR2  EQU   X'01'       READ CONTROLLER ERROR BYTE 2
                       120 *
                       121 *       EXTERNAL REGISTER        FBO--UNDER READ OP TAG
                       122 *
0010                   123 CLKG3     EQU   X'10'       CLOCK G3
0020                   124 CLKG2     EQU   X'20'       CLOCK G2
0030                   125 RDG4      EQU   X'30'       READ G4
0040                   126 RDG1      EQU   X'40'       READ G1
0050                   127 RDG3      EQU   X'50'       READ G3
0060                   128 RDG2      EQU   X'60'       READ G2
0070                   129 RDG3AM    EQU   X'70'       READ G3 AM SEARCH
00E0                   130 SPRDG2    EQU   X'E0'       SPECIAL READ G2
                       131 *
                       132 *       EXTERNAL REGISTER        FBO--UNDER WRITE OP TAG
                       133 *
0020                   134 WRG2      EQU   X'20'       WRITE G2
0040                   135 FMTG1     EQU   X'40'       FORMAT G1
0050                   136 FMTG3     EQU   X'50'       FORMAT G3
0060                   137 FMTG2     EQU   X'60'       FORMAT G2
0070                   138 FMTERASE  EQU   X'70'       FORMAT ERASE
0080                   139 WRG4      EQU   X'80'       WRITE G4
00C0                   140 SPFMTG1   EQU   X'C0'       SPECIAL FORMAT G1
00E0                   141 SPFMTG2   EQU   X'E0'       SPECIAL FORMAT G2
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       142 *
                       143 *       EXTERNAL REGISTER          FBO--UNDER SET HAR TAG
                       144 *
0080                   145 FORWARD  EQU   X'80'      DIRECTION BIT FOR SEEK
0040                   146 DIFF256  EQU   X'40'      DIFFERENCE COUNT 256 BIT
                       147 *
                       148 *       EXTERNAL REGISTER          FBO--UNDER CONTROL TAG (X'8F')
                       149 *
0008                   150 SKSTART  EQU   X'08'      SEEK START
0004                   151 RSTATTN  EQU   X'04'      RESET ATTENTION
000C                   152 CHKRST   EQU   X'0C'      CHECK RESET
0002                   153 REZERO   EQU   X'02'      REZERO
0009                   154 SNSDIFF  EQU   X'09'      SENSE DIFF REG
0005                   155 SNSHAR   EQU   X'05'      SENSE HAR
0003                   156 SENSTAT0 EQU   X'03'      SENSE STATUS BYTE 0
0083                   157 SENSTAT1 EQU   X'83'      SENSE STATUS BYTE 1
0043                   158 SENSTAT2 EQU   X'43'      SENSE STATUS BYTE 2
0023                   159 SENSTAT3 EQU   X'23'      SENSE STATUS BYTE 3
0013                   160 SENSTAT4 EQU   X'13'      SENSE STATUS BYTE 4
0008                   161 SNSRDWR  EQU   X'08'      SENSE RD/WR
0007                   162 RWCTRL   EQU   X'07'      READ/WRITE CONTROL
0040                   163 WRGATE   EQU   X'40'      WRITE GATE
0020                   164 UNSQELCH EQU   X'20'
0010                   165 RDGATE   EQU   X'10'
0080                   166 AMSRCH   EQU   X'80'      AM SEARCH
                       167 *
                       168 *       EXTERNAL REGISTER          FTI
                       169 *
0080                   170 SELACT   EQU   X'80'      SELECT ACTIVE
0040                   171 TAGVALID EQU   X'40'      TAG VALID
0020                   172 CHKEND   EQU   X'20'      CHECK END
0010                   173 CEALERT  EQU   X'10'      CE ALERT
0008                   174 NORMEND  EQU   X'08'      NORMAL END
0004                   175 SYNCIN   EQU   X'04'      SYNC IN
0002                   176 INDEX    EQU   X'02'      INDEX
0001                   177 ERRALERT EQU   X'01'      ERROR ALERT
                       178 *
                       179 *       EXTERNAL REGISTER          FBI -- DUMMY REGISTER FOR GATING FIO
                       180 *
0000                   181 DUMMY    EQU   L0
                       182 *
                       183 *       EXTERNAL REGISTER          FBI -- UNDER RD STATUS TAG
                       184 *
0080                   185 CTLRCHK  EQU   X'80'      CONTROLLER CHECK
0040                   186 INFCHK   EQU   X'40'      INTERFACE CHECK
0020                   187 DRVCHK   EQU   X'20'      DRIVE CHECK
0010                   188 RWCHK    EQU   X'10'      READ/WRITE CHECK
0008                   189 ONLINE   EQU   X'08'      ON LINE
0004                   190 ATTN     EQU   X'04'      ATTENTION
0002                   191 BUSY     EQU   X'02'      BUSY
0001                   192 SKDONE   EQU   X'01'      SEEK COMPLETE
                       193 *
                       194 *       EXTERNAL REGISTER          FBI -- UNDER RD/WR TAG
                       195 *
0002                   196 IDXMK    EQU   X'02'      INDEX MARK
0001                   197 ACTRK    EQU   X'01'      ACTIVE TRACK
                       198 *
                       199 *       EXTERNAL REGISTER          FBI -- UNDER RD/WR ON TAG VALID
                       200 *
0020                   201 LOSTORT  EQU   X'20'      LOST ORIENTATION
0008                   202 STATOVN  EQU   X'08'      STATUS OVERRUN
0002                   203 RG1UNORT EQU   X'02'      READ G1 UNORIENTED
0001                   204 ACTRACK  EQU   X'01'      ACTIVE TRACK
                       205 *
                       206 *       EXTERNAL REGISTER          FBI -- UNDER RD/WR ON CHECK END
                       207 *
0080                   208 CMDOVN   EQU   X'80'      READ/WRITE -- COMMAND OVERRUN
0040                   209 DATAOVN  EQU   X'40'      READ/WRITE -- DATA OVERRUN
0010                   210 DATACHK  EQU   X'10'      READ ONLY  -- DATA CHECK
0008                   211 NOAM     EQU   X'08'      "          -- NO AM FOUND
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0004                   212 NOSYNC   EQU   X'04'      "          -- NO SYNC BYTE FOUND
0002                   213 DATAFND  EQU   X'02'      "          -- DATA FOUND
0010                   214 TRKOVN   EQU   X'10'      WRITE ONLY -- TRACK OVERRUN
                       215 *
                       216 *       EXTERNAL REGISTER          FTG
                       217 *
0080                   218 TAGATE   EQU   X'80'      TAG GATE
0040                   219 SELHOLD  EQU   X'40'      SELECT HOLD
0020                   220 FORCERYC EQU   X'20'      FORCE RECYCLE
0008                   221 RESPONSE EQU   X'08'      RESPONSE GATE
0004                   222 FOTOFI   EQU   X'04'      DIAGNOSTIC GATE FO REG TO FI REG
0002                   223 DSYNCIN  EQU   X'02'      DIAGNOSTIC SYNC IN
0001                   224 ALLOWFBI EQU   X'01'      ALLOW FBI PARITY CHECK
                       225 *
                       226 *       EXTERNAL REGISTER          OST
                       227 *
0080                   228 IOPBUSY  EQU   X'80'      ATTACHMENT BUSY
0040                   229 CHOUTVAL EQU   X'40'      CHANNEL OUT REG VALID
0040                   230 DIFFZERO EQU   X'40'      DIFFERENCE COUNTER EQUAL ZERO
0020                   231 ENDCHXFR EQU   X'20'      END OF CHANNEL DATA XFER
0010                   232 ALWCHXFR EQU   X'10'      ALLOW CHANNEL DATA XFER
                       233 *
                       234 *       EXTERNAL REGISTER          SCN
                       235 *
0080                   236 SCANRD   EQU   X'80'      SCAN READ OR CMD
0040                   237 SCANHI   EQU   X'40'      SCAN HIGH OR EQUAL
0020                   238 SCNSPLIT EQU   X'20'      SCAN SPLIT FIELD
0010                   239 LASTREC  EQU   X'10'      LAST RECORD
0008                   240 ALWFXFR  EQU   X'08'      ALLOW FILE XFER
0004                   241 FILEODD  EQU   X'04'      FILE ODD XFER
0002                   242 TOFILE   EQU   X'02'      DATA TO FILE
0001                   243 NFILEXFR EQU   X'01'      INHIBIT FILE TO CS XFER
                       244 *
                       245 *       EXTERNAL REGISTER          FTR
                       246 *
0080                   247 ADTCKRST EQU   X'80'      ADAPTER CHECK RESET
0040                   248 IOATTN   EQU   X'40'      I/O ATTENTION LIGHT
0020                   249 DMATTN   EQU   X'20'      DATA MODULE ATTENTION--CAUSES AN INTERRUPT
0010                   250 IOCONB   EQU   X'10'      I/O CONDITION B
0008                   251 ERRTRAP  EQU   X'08'      DISABLE ERROR TRAP
0002                   252 INVPRTY  EQU   X'02'      INVERT PARITY
0001                   253 ALLOWIDX EQU   X'01'      INDEX ENABLE/RESET
                       254 *
                       255 *       EXTERNAL REGISTER          FHF
                       256 *
0080                   257 SPRESET  EQU   X'80'      SYSTEM/PWR ON RESET
0040                   258 CHKRESET EQU   X'40'      CHECK RESET CHANNEL
0020                   259 ERRMODE  EQU   X'20'      FORCE ERROR MODE
0008                   260 ENDTRAP  EQU   X'08'      END OF TRAP COUNT
0004                   261 SCNSAT   EQU   X'04'      SCAN SATISFIED
0002                   262 SCNEQ    EQU   X'02'      SCAN EQUAL
0001                   263 ENDFILEX EQU   X'01'      END OF FILE DATA XFER
                       264 *
                       265 *       EXTERNAL REGISTER          CO2
                       266 *
0001                   267 DDOLD    EQU   X'01'      ODD ADDRESS BIT
                       268 *
                       269 *       EXTERNAL REGISTER          DXC
                       270 *
0080                   271 DATACHAN EQU   X'80'      DATA TO/FROM CHANNEL
0040                   272 CHANODD  EQU   X'40'      CHANNEL ODD XFER
0020                   273 LSRCSR   EQU   X'20'      LSR CYCLE STEAL REQUEST
0010                   274 LSRSELDR EQU   X'10'      LSR SELECT DDDR
0008                   275 ALOWCHAN EQU   X'08'      ALLOW DIFF COUNTER CHANNEL
0004                   276 ALOWFILE EQU   X'04'      ALLOW DIFF COUNTER FILE
0002                   277 SUBTRACT EQU   X'02'      SUBTRACT
0001                   278 CHNL1BYT EQU   X'01'      CHANNEL ONE BYTE XFER
                       279 *
                       280 *       EXTERNAL REGISTER          MES
                       281 *
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0080                   282 CSOVRUN  EQU   X'80'     CYCLE STEAL OVERRUN
0040                   283 CICHECK  EQU   X'40'     CIO/CI1 PARITY CHECK
0010                   284 CHANXCHK EQU   X'10'     CHANNEL TRANSFER CHECK
0008                   285 ADAPTCHK EQU   X'08'     ADAPTER CHECK
0001                   286 RCSCHK   EQU   X'01'     RCS PARITY CHECK
                       287 *
                       288 *       EXTERNAL REGISTER        ADS
                       289 *
0080                   290 SYNCOUT  EQU   X'80'     SYNC OUT
0040                   291 RECYCLE  EQU   X'40'     RECYCLE
0020                   292 TIMEOUT  EQU   X'20'     TIMER OVERFLOWS
0010                   293 FILEXCHK EQU   X'10'     FILE TRANSFER CHECK
0008                   294 FBOCHK   EQU   X'08'     FBO PARITY CHECK
0004                   295 FTOCHK   EQU   X'04'     FTO PARITY CHECK
0002                   296 FBICHK   EQU   X'02'     FBI PARITY CHECK
0001                   297 EXTARCHK EQU   X'01'     EXTERNAL ADDRESS CHECK
                       298 *
                       299 *       LOCAL REGISTER           GEN1
                       300 *
0080                   301 STACKCMD EQU   X'80'     STACK CMD PENDING
0040                   302 FINCHXFR EQU   X'40'     FINISH CHAN XFER
0020                   303 FIXDDCF  EQU   X'20'     RESTORE DDCF
0010                   304 XFRHACNT EQU   X'10'     TRANSFER HA AND COUNT
0008                   305 XFRDDDF  EQU   X'08'     TRANSFER DDDF
0004                   306 SETRWON  EQU   X'04'     SET RD/WR TAG ON
0002                   307 UPDTRDUS EQU   X'02'     UPDATE READ USAGE COUNTER
0001                   308 DDDXFER  EQU   X'01'     FILE DDD XFER SWITCH
                       309 *
                       310 *       LOCAL REGISTER           UNCK
                       311 *
0080                   312 INTREQD1 EQU   X'80'     INTERVENTION REQD -- DRIVE 1
0040                   313 INTREQD2 EQU   X'40'     INTERVENTION REQD -- DRIVE 2
0020                   314 INTREQD3 EQU   X'20'     INTERVENTION REQD -- DRIVE 3
0010                   315 INTREQD4 EQU   X'10'     INTERVENTION REQD -- DRIVE 4
0008                   316 CTROFLD1 EQU   X'08'     USAGE COUNTER OVERFLOW -- DRIVE 1
0004                   317 CTROFLD2 EQU   X'04'     USAGE COUNTER OVERFLOW -- DRIVE 2
0002                   318 CTROFLD3 EQU   X'02'     USAGE COUNTER OVERFLOW -- DRIVE 3
0001                   319 CTROFLD4 EQU   X'01'     USAGE COUNTER OVERFLOW -- DRIVE 4
                       320 *
                       321 *       LOCAL REGISTER           STAT
                       322 *
0080                   323 ERRRETUN EQU   X'80'     ERROR RETURN
0040                   324 SCANEQUL EQU   X'40'     SCAN EQUAL
0010                   325 OPEND    EQU   X'10'     OP END
0008                   326 NOOP     EQU   X'08'     NO OP
0002                   327 UNITCHK  EQU   X'02'     UNIT CHECK
0001                   328 SKCMPL   EQU   X'01'     SEEK COMPLETE
                       329 *
                       330 *       LOCAL REGISTER           CEB1
                       331 *
0080                   332 ROCTODF  EQU   X'80'     RD RO COUNT FIELD TO DDDF
0040                   333 FMTWR    EQU   X'40'     FORMAT WRITE COMMAND
0020                   334 WRENABLE EQU   X'20'     WRITE ENABLED
0010                   335 PADTOIDX EQU   X'10'     PADDING
0008                   336 PROCRO   EQU   X'08'     PROCESS RO COUNT FIELD
0004                   337 PROCNT   EQU   X'04'     PROCESS COUNT FIELD
0002                   338 PROCKEY  EQU   X'02'     PROCESS KEY FIELD
0001                   339 PROCDAT  EQU   X'01'     PROCESS DATA FIELD
                       340 *
                       341 *       LOCAL REGISTER           CEB2
                       342 *
0080                   343 READ     EQU   X'80'     READ COMMAND
0040                   344 SRCH     EQU   X'40'     SEARCHING
0020                   345 WRITE    EQU   X'20'     WRITE COMMAND
0008                   346 WHAOK    EQU   X'08'     SD BYTES IN CONTROL STORE VALID
0000                   347 ENDHA    EQU   X'00'     END OF HA
0001                   348 ENDROCNT EQU   X'01'     END OF RO COUNT
0002                   349 ENDKEY   EQU   X'02'     END OF KEY
0003                   350 ENDDAT   EQU   X'03'     END OF DATA
0004                   351 ENDCNT   EQU   X'04'     END OF COUNT
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0006                   352 ENDKEY1  EQU   X'06'     END OF FIRST SEGMENT KEY
0007                   353 ENDDAT1  EQU   X'07'     END OF FIRST SEGMENT DATA
                       354 *
                       355 *       LOCAL REGISTER           MSC1
                       356 *
0080                   357 RDSNS    EQU   X'80'     READ DIAG SENSE CMD
0040                   358 MUTRK    EQU   X'40'     MULTIPLE TRACK OP
0020                   359 MUREC    EQU   X'20'     MULTIPLE RECORD OP
0008                   360 IDXP2    EQU   X'08'     INDEX PASSED TWICE
0004                   361 IDXP1    EQU   X'04'     INDEX PASSED ONCE
0002                   362 ERASE    EQU   X'02'     ERASE TO INDEX
0001                   363 TRKOFL   EQU   X'01'     TRACK OVERFLOW
                       364 *
                       365 *       LOCAL REGISTER           MSC2
                       366 *
0080                   367 SCANSW   EQU   X'80'     BYTE TRANSFER COUNT MARK FOR SCAN OP
0040                   368 DDCRODD  EQU   X'40'     DDCR ON ODD ADDR BOUNDARY
0020                   369 DDDRODD  EQU   X'20'     DDDR ON ODD ADDR BOUNDARY
0008                   370 DL0      EQU   X'08'     DATA LENGTH EQUAL ZERO
0004                   371 SIZE12   EQU   X'04'     12MB DATA MODULE
0002                   372 KDGT256  EQU   X'02'     KL+DL GREATER THAN 256 / BYTEREAD OVERFLOW
0001                   373 DL256    EQU   X'01'     DATA LENGTH 256 BIT
                       374 *
                       375 *       LOCAL REGISTER           FLAG/FFLG
                       376 *
0080                   377 DEFCNT   EQU   X'80'     DEFECT IN COUNT FIELD
0040                   378 DEFKEY   EQU   X'40'     DEFECT IN KEY FIELD
0020                   379 DEFDAT   EQU   X'20'     DEFECT IN DATA FIELD
0004                   380 CMPDAT   EQU   X'04'     COMPRESSED DATA FMT  (S/3 ONLY)        -<CD>-
0002                   381 DEFTRK   EQU   X'02'     DEFECTIVE TRACK
0001                   382 ALTTRK   EQU   X'01'     ALTERNATE TRACK
                       383 *
                       384 *       MISCELLANEOUS
                       385 *
00FF                   386 FF       EQU   X'FF'
0080                   387 ALOW12   EQU   X'80'     ALLOW OPERATION ON 12MB DATA MODULE
0040                   388 ALOWSKCE EQU   X'40'     ALLOW SEEK TO CE TRACKS
0020                   389 FORCERST EQU   X'20'     FORCE SYSTEM RESET
0008                   390 ALWRTHA  EQU   X'08'     ALLOW WRITE HA SVP OPTION
0002                   391 SVPREQ   EQU   X'02'     SVP REQUEST LATCH
                       392 *
                       393 *       A L S   &   Z L S    ASSIGNMENT
                       394 *
0001                   395 INDEXB   DABR  1         INDEX FOR BASE
0003                   396 INDEXCH  DABR  3         INDEX FOR CHANNEL TRAP
0005                   397 INDEXF1  DABR  5         INDEX FOR FILE TRAP 1ST
0007                   398 INDEXF2  DABR  7         INDEX FOR FILE TRAP 2ND
0009                   399 INDEXE1  DABR  9         INDEX FOR EXTERNAL TRAP 1ST
0008                   400 INDEXE2  DABR  11        INDEX FOR EXTERNAL TRAP 2ND
000D                   401 INDEXE3  DABR  13        INDEX FOR EXTERNAL TRAP 3RD
000F                   402 INDEXE4  DABR  15        INDEX FOR EXTERNAL TRAP 4TH
001F                   403 INDEXIT  DADR  31        INDEX FOR MASKING TRAPS
                       404 *
0018                   405 MIARBB   DABR  24        MIAR BLOCK FOR BASE LEVEL
0018                   406 MIARBD   DADR  24        MIAR DISPL FOR BASE LEVEL
0014                   407 MIAREB   DABR  20        MIAR BLOCK FOR EXTERNAL LEVEL
0014                   408 MIARED   DADR  20        MIAR DISPL FOR EXTERNAL LEVEL
                       409 *
001E                   410 BLOCKCH  DABR  30        BLOCK ADDR FOR CHANNEL TRAP
001E                   411 DISPCH   DADR  30        DISPL ADDR FOR CHANNEL TRAP
0006                   412 BLOCKFC  DABR  6         BLOCK ADDR FOR FILE (DDCF) TRAP
0006                   413 DISPFC   DADR  6         DISPL ADDR FOR FILE (DDCF) TRAP
000A                   414 BLOCKFD  DABR  10        BLOCK ADDR FOR FILE (DDDF) TRAP
000A                   415 DISPFD   DADR  10        DISPL ADDR FOR FILE (DDDF) TRAP
001A                   416 BLOCKB   DABR  26        BLOCK ADDR FOR BASE
0016                   417 BLOCKE   DABR  22        BLOCK ADDR FOR EXTERNAL TRAP
                       418 *
0006                   419 ZLSLOCB  DZR   6         LOCAL ZONE FOR BASE
0005                   420 ZLSLOCE  DZR   5         LOCAL ZONE FOR EXTERNAL TRAP
0007                   421 ZLSLOC7  DZR   7         ZLS LOCATION 7
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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

000E                   422 ZLSEXTB  DZR   14          EXTERNAL ZONE FOR BASE
000D                   423 ZLSEXTE  DZR   13          EXTERNAL ZONE FOR EXTERNAL TRAP
0009                   424 ZLSEXTFC DZR    9          EXTERNAL ZONE FOR FILE DDCF TRAP
000A                   425 ZLSEXTFD DZR   10          EXTERNAL ZONE FOR FILE DDDF TRAP
000F                   426 ZLSEXTC  DZR   15          EXTERNAL ZONE FOR CHANNEL TRAP
0017                   427 ZLSCH    DZR   23          ZONE FOR CHANNEL TRAP
0011                   428 ZLSFC    DZR   17          ZONE FOR FILE (DDCF) TRAP
0012                   429 ZLSFD    DZR   18          ZONE FOR FILE (DDDF) TRAP
                       430 *
                       431 *       EQUATES FOR LOADING ZLS
                       432 *
004A                   433 ZLSRFILE EQU   X'4A'       READ DATA FROM FILE
00CE                   434 ZLSWFILE EQU   X'CE'       WRITE DATA TO FILE
005B                   435 ZLSFCHAN EQU   X'5B'       FETCH DATA FROM CHANNEL
00DD                   436 ZLSSCHAN EQU   X'DD'       STORE DATA TO CHANNEL
                       437 *
0020                   438 IDXDDCF  EQU   X'20'       DDCF INDEX
0040                   439 IDXDDDF  EQU   X'40'       DDDF INDEX
                       441         END COPY-MEMBER EQUATES
                       442       COPY      TIL
                       443 *-------------------------------------------------------*
                       444 *                                                       *
                       445 *   TIL -- 3340 DISK IPL MICROCODE                      *
                       446 *                                                       *
                       447 *-------------------------------------------------------*
                       448 *
                       449 *--------  INITIALIZATION OF IOP  ----------------------
                       450 *
0000 299880  169880    451 TILENTRY SMODE 0,24              SETUP
0001 289800  129800    452         SABI  MIARBB,B(TILSTART)   ALS FOR
0002 288807  128807    453         SADI  MIARBD,D(TILSTART)     PGM 6
0003 0A2D80  08AD80    454         LBI   FTR,ADTCKRST       ADAPTER CHECK RESET &
0004 0A2D08  08AD08    455         LBI   FTR,ERRTRAP          DISABLE ERROR TRAPS
0005 28BFC0  12BFC0    456         SADI  INDEXIT,X'C0'      SWITCH TO PGM 6 AND
0006 000112  000112    457         B     TILERR01             SETUP PGM 5
0007 08BF8F  02BFBF    458 TILSTART SADI  INDEXIT,X'8F'      RESTORE PGM 5 POINTER
                       459 *
                       460 *--------  INITIALIZE ALS  -----------------------------
                       461 *
0008 089A06  029A06    462         SABI  BLOCKB,X'06'       SET BASE BLOCK TO CS BUFFER
0009 08AA00  02AA00    463         SADI  DISPFD,X'00'       RESET FILE/DDDF ALS-D
000A 08BE00  02BE00    464         SADI  DISPCH,X'00'       RESET CHANNEL ALS-D
                       465 *
                       466 *--------  GET RECORD ID VIA HANDSHAKE  ----------------
                       467 *
000B 28EC00  13AC00    468         SLKI  12,0               RESET SVP/SET PCR
000C 2AE100  1BA100    469         LLKR  L0,1               FETCH SVP REQUEST FL
000D 27800C  1E400C    470         TBOFF 6,L0,*-1           WAIT FOR SVP REQUEST
000E 0AE017  0BA017    471         LLKR  CL0,0              GET CAR
000F 28EC00  13AC00    472         SLKI  12,0               RESET SVP/SET PCR
0010 2AE100  1BA100    473         LLKR  L0,1               FETCH SVP REQUEST FL
0011 078010  0E4010    474         TBOFF 6,L0,*-1           WAIT FOR SVP REQUEST
0012 0AE018  0BA018    475         LLKR  HEAD,0             GET HAR
0013 28EC00  13AC00    476         SLKI  12,0               RESET SVP/SET PCR
0014 2AE100  1BA100    477         LLKR  L0,1               FETCH SVP REQUEST FL
0015 278014  1E4014    478         TBOFF 6,L0,*-1           WAIT FOR SVP REQUEST
0016 2AE00D  1BA00D    479         LLKR  RBYT,0             GET PEC
0017 2A0500  188500    480         LBI   L5,00              RESET NORMAL END CHECK FLAG
                       481 *
                       482 *--------  SELECT & SEEK TO FUNCTIONAL MICROCODE IF INITIAL ENTRY ----
                       483 *
0018 0C8D01  02CD01    484         TEORI RBYT,1             CHECK FOR INITIAL ENTRY
0019 224115  190115    485         BZ    TILSEL               GO IF YES
                       486 *
                       487 *--------  RESET CONTROLLER FROM THE READ/WRITE MODE  ---------
                       488 *
001A 0A2605  08A605    489         LBI   FTO,RSTRDWR        SETUP RESET READ/WRITE TAG
001B 000181  000181    490         BU    TILNOCK            ISSUE TAG
                       491 *
                       492 *--------  SET HEAD ADDRESS REGISTER IN CONTROLLER  ----------
```



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LOC.  OBJECT CODE      STM       SOURCE STATEMENT

                       493 *
001C 0A268B  08A68B    494 TILSTHAR LBI   FTO,SETHAR        SETUP SET
001D 0B2E18  0CAE18    495         NV    F80,HEAD             HAR TAG
001E 000181  000181    496         BU    TILNOCK            ISSUE TAG
                       497 *
                       498 *--------  CONDITION CONTROLLER TO READ AND WRITE  ----------
                       499 *
001F 2A2685  18A685    500         LBI   FTO,SETRDWR        SETUP SET READ/WRITE TAG
0020 000181  000181    501         BU    TILNOCK            ISSUE TAG
0021 20018A  10018A    502         BU    TILNOSCN           WAIT FOR NORMAL END & ISSUE RESPONSE
                       503 *
                       504 *--------  SET UP CHANNEL TRANSFER CONTROLS TO READ 512 BYTES  --------
                       505 *
0022 0A2101  08A101    506         LBI   CCH,1              SET CHANNEL COUNTER
0023 2A31FE  18B1FE    507         LBI   CCL,254              FOR 512 BYTE XFER
0024 0A3398  08B398    508         LBI   DXC,DATACHAN+LSRSELDR+ALOWCHAN DATA TO CHANNEL WITH DDDR
0025 2A2310  18A310    509         LBI   DST,ALWCHXFR       ALLOW CHANNEL TRANSFER
                       510 *
                       511 *--------  ORIENT ON HOME ADDRESS  ---------------------------
                       512 *
0026 2A260E  18A60E    513         LBI   FTO,READOP         SET READ TAG
0027 0A2E49  08AE49    514         LBI   F80,RDG1+9           TO READ HA
0028 000181  000181    515         BU    TILNOCK            ISSUE TAG
0029 0A2F09  08AF09    516         LBI   SCN,ALWFXFR+NFILEXFR INHIBIT DATA XFER FOR ORIENTING
002A 0A3608  08B608    517         LBI   FCT,8              SET FILE COUNTER FOR FIELD LENGTH
002B 20018A  10018A    518         BU    TILNOSCN           WAIT FOR NORMAL END & ISSUE RESPONSE
002C 0A2D01  08AD01    519         LBI   FTR,ALLOWIDX       ALLOW INDEX DETECTION
                       520 *
                       521 *--------  READ A COUNT FIELD INTO CS  -----------------------
                       522 *
002D 2A2E7D  13AE7D    523 TILRDCNT LBI   F80,RDG3AM+13      SET TAG TO READ A COUNT FIELD
002E 000181  000181    524         BU    TILNOCK            ISSUE TAG
002F 2A2F08  18AF08    525         LBI   SCN,ALWFXFR        ALLOW FILE TRANSFER
0030 2A360C  18860C    526         LBI   FCT,12             SET FILE COUNTER TO FIELD LENGTH
0031 20018A  10018A    527         BU    TILNOSCN           WAIT FOR NORMAL END & ISSUE RESPONSE
0032 08AA00  02AA00    528         SADI  DISPFD,X'00'       RESET FILE/DDDF ALS-D
                       529 *
                       530 *--------  UNLOAD COUNT FIELD INTO DLS  ----------------------
                       531 *
0033 2A0000  188000    532         LBI   L0,X'00'           LOAD BUFFER
0034 2A0180  188180    533         LBI   L1,X'80'             DISPLACEMENTS
0035 2440DD  1140DD    534         LINC  SDH,L0,1           FETCH SDH
0036 0441DE  0141DE    535         LINC  SDL,L1,1                 SDL
0037 0440CE  0140CE    536         LINC  PAC,L0,1                 PAC
0038 24C1CF  1341CF    537         LINC  PAH,L1,3                 PAH
0039 2400D5  1040D5    538         LINC  FLAG,L0,0                FLAG
003A 0401D9  0041D9    539         LINC  REC,L1,0                 REC
                       540 *
                       541 *--------  CHECK PHYSICAL ADDRESS AGAINST SEEK ARGUMENTS  ----------
                       542 *
003B 2D8E57  16CE57    543         TEOR  PAC,CL0            COMPARE PHYSICAL CLYINDER
003C 004113  010113    544         BNZ   TILERR02             GO IF NOT EQUAL
003D 0D8F58  06CF58    545         TEOR  PAH,HEAD           COMPARE PHYSICAL HEAD
003E 004113  010113    546         BNZ   TILERR02             GO IF NOT EQUAL
                       547 *
                       548 *--------  CHECK FOR RECORD = R-BYTE  ------------------------
                       549 *
003F 0D994D  06D94D    550         TEOR  REC,RBYT           COMPARE RECORD
0040 22404B  19004B    551         BZ    TILRECO1             GO IF EQUAL
                       552 *
                       553 *--------  CHECK FOR RECORD + 2 =  R-BYTE  -------------------
                       554 *
0041 0ED902  0BD902    555         ADDI  REC,2              BUMP REC BY 2
0042 0D994D  06D94D    556         TEOR  REC,RBYT           COMPARE RECORD
0043 00402D  01002D    557         BNZ   TILRDCNT             GO IF NOT EQUAL
                       558 *
                       559 *--------  SKIP FIRST 2 DATA FIELDS & ANY G4 GAP IF NECESSARY  --------
                       560 *
0044 269548  1A5548    561         TIBOF DEFDAT,FLAG,TILSKIP2 CHECK FOR DEFECT, GO IF NONE
0045 059D48  065D48    562         TBON  6,SDH,TILSKIP2     CHECK FOR SDH = 2 OR 3, GO IF YES
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 LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0046 0E15DF   08D5DF   563          ANDI  FLAG,FF-DEFDAT      RESET DEFECT
0047 2000ED   1000ED   564          BU    TILCLKG4            SKIP A G4 GAP
0048 0000E3   0000E3   565 TILSKIP2 BU    TILCLKG2            SKIP 2 G2 GAPS
0049 0000E3   0000E3   566          BU    TILCLKG2              AND 2 DATA FIELDS
004A 20004D   10004D   567          B     TILCOMMO            GO TO COMMON POINT
                       568 *
                       569 *--------  PREPARE TO TRANSFER DATA FIELDS TO CHANNEL  ----------------
                       570 *
004B 279D4D   1E5D4D   571 TILRECO1 TBOFF 6,SDH,TILCOMMO      CHECK FOR DEFECT IN LAST 2 FIELDS
004C 0E15DF   08D5DF   572          ANDI  FLAG,FF-DEFDAT      RESET DEFECT
004D 0E7304   09F304   573 TILCOMMO ORI   DXC,ALOWFILE        ALLOW FILE DIFFERENCE COUNTER
004E 06955D   0A555D   574          TIBOF DEFDAT,FLAG,TILNODEF CHECK FOR DEFECT, GO IF NONE
004F 27DD58   1F5D58   575          TBOFF 7,SDH,TILRECO2      CHECK FOR SDH = 0 OR 2, GO IF YES
0050 26DE55   1B5E55   576          TBOFF 3,SDL,TILMV13       CHECK FOR MOVED 1 OR 3, GO IF YES
0051 0000EF   0000EF   577          BU    TILRDG2             READ A G2 GAP AND DATA FIELD
0052 0000F2   0000F2   578          BU    TILSRDG2            READ A G2 GAP & FIRST SEGMENT
                       579 *                                   OF SPLIT DATA FIELD
0053 2000E7   1000E7   580          BU    TILRDG4             READ A G4 GAP & SECOND SEGMENT
                       581 *                                   OF A SPLIT FIELD
0054 20005F   10005F   582          B     TILEXIT             GO TO EXIT ROUTINE
0055 0000EF   0000EF   583 TILMV13  BU    TILRDG2             READ A G2 GAP AND DATA FIELD
0056 2000ED   1000ED   584          BU    TILCLKG4            SKIP A G4 GAP BEFORE MOVED FIELD
0057 00005E   00005E   585          B     TILRDG22            GO READ SECOND DATA FIELD
0058 26DE5C   1B5E5C   586 TILRECO2 TBOFF 3,SDL,TILMVO2       CHECK FOR MOVED 0 OR 2, GO IF YES
0059 0000F2   0000F2   587          BU    TILSRDG2            READ A G2 GAP & FIRST SEGMENT OF
                       588 *                                   A SPLIT DATA FIELD
005A 2000E7   1000E7   589          BU    TILRDG4             READ A G4 GAP & SECOND SEGMENT OF
                       590 *                                   A SPLIT DATA FIELD
005B 00005E   00005E   591          B     TILRDG22            GO READ SECOND DATA FIELD
005C 2000ED   1000ED   592 TILMVO2  BU    TILCLKG4            SKIP A G4 GAP BEFORE MOVED FIELD
005D 0000EF   0000EF   593 TILNODEF BU    TILRDG2             READ A G2 GAP AND DATA FIELD
005E 0000EF   0000EF   594 TILRDG22 BU    TILRDG2             READ A G2 GAP AND DATA FIELD
005F 26A35F   1A635F   595 TILEXIT  TIBOF ENDCHXFR,DST,*       WAIT FOR END OF CHANNEL XFER
0060 28EC00   13AC00   596          SLKI  12,0                RESET SVP REQUEST/SET PCR REQUEST
0061 0A2300   08A300   597          LBI   DST,0               RESET ALLOW CHANNEL XFER
0062 000062   000062   598          B     *                 ********** SPIN ON SUCCESS **********
                       600 *
                       601 *--------  FILE I/O OPERATIONS  ---------------------------------------
                       602 *
                       603 *
                       604 *--------  SETUP TAG AND COUNT FOR CLOCK G2  ---------------------------
                       605 *
0063 0A2E20   08AE20   606 TILCLKG2 LBI   FBO,CLKG2            SET TAG BUS TO CLOCK OVER G2 & DATA
0064 0A07FF   0887FF   607          LBI   L7,255              SET COUNT FOR 256 BYTE FIELD
0065 2A2F01   18AF01   608 TILCOMM1 LBI   SCN,NFILEXFR        INHIBIT FILE TO CS TRANSFER
0066 000100   000100   609          B     TILCHK              GO ISSUE TAG/WAIT FOR NE
                       610 *
                       611 *--------  SETUP TAG AND COUNT FOR READ G4  ----------------------------
                       612 *
0067 2E9EFF   1ADEFF   613 TILRDG4  EORI  SDL,FF              FORM LENGTH OF
0068 2EDE01   1BDE01   614          ADDI  SDL,1                 SECOND SEGMENT
0069 27DE6B   1F5E6B   615          TBOFF 7,SDL,*+2           SET FILE ODD XFER IF
006A 2E6F04   19EF04   616          ORI   SCN,FILEODD           SECOND SEGMENT IS ODD
006B 2A0630   188630   617          LBI   L6,RDG4             SETUP FOR READ G4 TAG
006C 000073   0C0073   618          B     TILCOMM2            GO TO COMMON POINT
                       619 *
                       620 *--------  SET UP TAG AND COUNT FOR CLOCK G4  --------------------------
                       621 *
006D 2A2E30   18AE30   622 TILCLKG4 LBI   FBO,RDG4            SET TAG BUS TO READ G4 GAP
006E 200065   100065   623          B     TILCOMM1            GO SET SCN AND ISSUE YAG
                       624 *
                       625 *--------  SET UP TAG AND COUNT FOR READ G2  ---------------------------
                       626 *
006F 2A2E60   18AE60   627 TILRDG2  LBI   FBO,RDG2            SET TAG FOR READ G2
0070 0A07FF   0887FF   628          LBI   L7,255              SET COUNT FOR 256 BYTE FIELD
0071 000100   000100   629          B     TILCHK              GO ISSUE TAG/WAIT FOR NE
                       630 *
                       631 *--------  SET UP TAG AND COUNT FOR SPECIAL READ G2  --------------------
                       632 *
0072 0A06E0   0886E0   633 TILSRDG2 LBI   L6,SPRDG2           SETUP FOR SPECIAL READ G2 TAG
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```
 LOC.  OBJECT CODE      STM       SOURCE STATEMENT

0073 0B2E1E   0CAE1E   634 TILCOMM2 MV    FBO,SDL             PUT MODULO 16 SEGMENT
0074 0E2E0F   08EE0F   635          ANDI  FBO,15                LENGTH IN FBO
0075 2F6E46   1DEE46   636          OR    FBO,L6              OR IN TAG
0076 2B071E   1C871E   637          MV    L7,SDL              MOVE SEGMENT LENGTH TO L7
0077 2EC7FF   1BC7FF   638          ADDI  L7,-1               FORM COUNT
0078 000100   000100   639          B     TILCHK              GO ISSUE TAG/WAIT FOR NE
                       640          MBLOK
0079 000079   000079   641+         B     *                   UNUSED ::::::::::::
007A 00007A   00007A   642+         B     *                   UNUSED ::::::::::::
007B 20007B   10007B   643+         B     *                   UNUSED ::::::::::::
007C 00007C   00007C   644+         B     *                   UNUSED ::::::::::::
007D 20007D   10007D   645+         B     *                   UNUSED ::::::::::::
007E 20007E   10007E   646+         B     *                   UNUSED ::::::::::::
007F 00007F   00007F   647+         B     *                   UNUSED ::::::::::::
0100                   648+         DS    <0>8
                       649 *
                       650 *--------  ISSUE TAG  -------------------------------------------------
                       651 *
0100 0A0580   088580   652 TILCHK   LBI   L5,X'80'             SET MARK FOR CHECKING NE
0101 2E6580   19E580   653 TILNOCK  ORI   FTG,TAGATE           RAISE TAG GATE
0102 0ED020   0BD020   654          ADDI  ZER,32                WAIT FOR
0103 228102   1A0102   655          BNC   *-1                   7.6 MICROSECONDS
0104 2E6510   19E510   656          ORI   FTG,X'10'            GATE BUS IN TO FI
0105 0E256E   08E56E   657          ANDI  FTG,X'6E'           DROP TAG GATE, RESET FBI CHECK
0106 0B2200   0CA200   658          MV    FBI,DUMMY           GATE FI TO FBI
0107 260511   184511   659          TBOFF 0,L5,TILRETRN       RETURN IF MARK IS OFF
                       660 *
                       661 *--------  LOAD SCN AND FCT FOR DATA TRANSFER  ------------------------
                       662 *
0108 2E5F08   19EF08   663          ORI   SCN,ALWFXFR         ALLOW FILE TRANSFER
0109 2B3607   1C8607   664          MV    FCT,L7              SET FILE COUNTER TO FIELD LENGTH
                       665 *
                       666 *--------  WAIT FOR NORMAL END & ISSUE RESPONSE TO CONTROLLER  ---------
                       667 *
010A 05B514   067514   668 TILNOSCN TIBON INDEX,FTI,TILERR03   CHECK FOR INDEX
0103 07350A   0C750A   669          TIBOF NORMEND,FTI,*-1       WAIT FOR NORMAL END
010C 2E6508   19E508   670          ORI   FTG,RESPONSE          GENERATE RESPONSE
010D 0E25F7   08E5F7   671          ANDI  FTG,FF-RESPONSE         TO CONTROLLER
010E 0A2F00   08AF00   672          LBI   SCN,0                 RESET ALLOW FILE TRANSFER
010F 042B0F   00B80F   673          TIBON CSOVRUN,HES,*         HANG ON CS OVERRUN
0110 0F6750   0DE750   674          OR    FHF,ZER               RESET END OF FILE TRANSFER & RETURN
0111 0B0590   0C8590   675 TILRETRN MVU   L5,ZER                 RESET MARK
0112 000112   000112   676 TILERR01 B     *                     HANG ON ERROR TRAP
0113 200113   100113   677 TILERR02 B     *                     HANG ON SEEK CHECK
0114 000114   000114   678 TILERR03 B     *                     HANG ON INDEX CHECK
                       679 *
                       680 *--------  SEEK TO FUNCTIONAL MICROCODE  ------------------------------
                       681 *
                       682 ************************************************************************
                       683 *    THIS INSTRUCTION IS NEEDED TO MAINTAIN COMPATIBILITY BETWEEN      *
                       684 *    ROS EC 441203 AND ROS EC 441204.                                  *
0115 0A2500   08A500   685 TILSEL   LBI   FTG,0                 DROP SELECT HOLD
                       686 ************************************************************************
0116 2A2683   18A683   687          LBI   FTO,SELDEV            SELECT DRIVE TAG
0117 2A2E00   18AE00   688          LBI   FBO,0                 SET BUS FOR DRIVE 1
0118 2FAE10   1EEE10   689          ADDE  FBO,ZER               ADD IN EXTERNAL CARRY
0119 0EAE01   0AEE01   690          EORI  FBO,1                 INVERT EXTERNAL CARRY LOGIC
011A 2E6540   19E540   691          ORI   FTG,SELHOLD           RAISE SELECT HOLD
011B 000181   000181   692          BU    TILNOCK               ISSUE TAG TO SELECT DRIVE
011C 0A268B   08A68B   693          LBI   FTO,SETHAR            SETUP SET
011D 0B2E18   0CAE18   694          MV    FBO,HEAD                HAR TAG
011E 0E6E80   09EE80   695          ORI   FBO,X'80'             SET IN/OUT BIT TO IN
011F 000181   000181   696          BU    TILNOCK               ISSUE TAG
0120 2A268C   18A68C   697          LBI   FTO,SETDIFF           SETUP SET
0121 0B2E17   0CAE17   698          MV    FBO,CLD                 DIFF TAC
0122 000181   000181   699          BU    TILNOCK               ISSUE TAG
0123 0ED020   0BD020   700          ADDI  ZER,32                WAIT FOR
0124 228123   1A0123   701          BNC   *-1                     7.6 MICROSECONDS
0125 2A268F   18A68F   702          LBI   FTO,CONTROL           SETUP TAG TO
0126 0A2E08   08AE08   703          LBI   FBO,SKSTART             START SEEK
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LOC.  OBJECT CODE      STM      SOURCE STATEMENT

0127 000181   000181   704         BU    TILNOCK          ISSUE TAG
0128 0A2684   08A684   705         LBI   FTO,RDSTATUS     SETUP TAG TO READ STATUS
0129 000181   000181   706         BU    TILNOCK          ISSUE TAG
012A 0CA209   02E209   707         TEORI FB1,ONLINE+SKDONE CHECK FOR ONLINE & SEEK COMPLETE
012B 004129   010129   708         BNZ   *-2                IF NOT REISSUE TAG AND WAIT
012C 00001C   00001C   709         B     TILSTHAR         &RETURN
012D 00012D   00012D   710         B     *                UNUSED  ::::::::::::
012E 00012E   00012E   711         B     *                UNUSED  ::::::::::::
012F 20012F   10012F   712         B     *                UNUSED  ::::::::::::
0130 000130   000130   713         B     *                UNUSED  ::::::::::::
0131 200131   100131   714         B     *                UNUSED  ::::::::::::
0132 200132   100132   715         B     *                UNUSED  ::::::::::::
0133 000133   000133   716         B     *                UNUSED  ::::::::::::
                       717         END COPY-MEMBER TIL
      634448A2         718   END
```


CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
ACTRACK	0001	0204		
ACTRK	0001	0197		
ADAPTCHK	0008	0285		
ADS	0029	0013		
ADTCKRST	0080	0247		0454
ALLOWFBI	0001	0224		
ALLOWIOX	0001	0253		0519
ALOWCHAN	0008	0275		0508
ALOWFILE	0004	0276		0573
ALOWSKCE	0040	0388		
ALOW12	0080	0387		
ALTTRK	0001	0382		
ALWCHXFR	0010	0232		0509
ALWFXFR	0008	0240		0516 0525 0663
ALWRTHA	0008	0390		
AMSRCH	0080	0166		
ATTN	0004	0190		
BLOCKB	001A	0414		0462
BLOCKCH	001E	0410		
BLOCKE	0016	0417		
BLOCKFC	0006	0412		
BLOCKFD	000A	0414		
BOO	003D	0032		
BUSY	0002	0191		
CCH	0021	0028		0506
CCL	0031	0029		0507
CEALERT	0010	0173		
CEB1	0011	0056		
CEB2	0012	0057		
CHANODD	0040	0272		
CHANXCHK	0010	0284		
CHI	0016	0061		
CHKEND	0020	0172		
CHKRESET	0040	0258		
CHKRST	000C	0152		
CHNLJBYT	0001	0278		
CHOUTVAL	0040	0229		
CICHECK	0040	0283		
CLKG2	0020	0124		0606.
CLKG3	0010	0123		
CLO	0017	0062		0471 0543 0698
CMDOVN	0080	0208		
CMPDAT	0004	0380		
CONTROL	008F	0111		0702
CO2	0038	0015		
CSOVRUN	0080	0282		0673
CTLRCHK	0080	0185		
CTLRERR1	0002	0118		
CTLRERR2	0001	0119		
CTROFLD1	0008	0316		
CTROFLD2	0004	0317		
CTROFLD3	0002	0318		
CTROFLD4	0001	0319		
DATACHAN	0080	0271		0508
DATACHK	0010	0210		
DATAFND	0002	0213		
DATAOVN	0040	0209		
DCNT	001B	0066		
DDCRODD	0040	0368		
DDDRODD	0020	0369		
DDODD	0001	0267		
DEFCNT	0080	0377		
DEFDAT	0020	0379		0561 0563 0572 0574
DEFKEY	0040	0378		
DEFTRK	0002	0381		
DIAGSET	008A	0108		
DIFFZERO	0040	0230		
DIFF256	0040	0146		

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
DISPCEHI	000C	0103		
DISPCELO	000D	0104		
DISPCH	001E	0411		0464
DISPFC	0006	0413		
DISPFD	000A	0415		0463 0528
DLO	0008	0370		
DL256	0001	0373		
DMATTN	0020	0249		
DRVCHK	0020	0187		
DST	0023	0024		0509 0595 0597
DSYNCIN	0002	0223		
DUMMY	0000	0181		0658
DXC	0033	0019		0508 0573
ECCCNTL	0008	0100		
ECCHI	0040	0116		
ECCLOW	0080	0115		
ENDCHXFR	0020	0231		0595
ENDCNT	0004	0351		
ENDDAY	0003	0350		
ENDDAT1	0007	0353		
ENDFILEX	0001	0263		
ENDHA	0000	0347		
ENDKEY	0002	0349		
ENDKEY1	0006	0352		
ENDROCNT	0001	0348		
ENDTRAP	0008	0260		
ERASE	0002	0362		
ERRALERT	0001	0177		
ERRMODE	0020	0259		
ERRRETUN	0080	0323		
ERRTRAP	0008	0251		0455
EXTARCHK	0001	0297		
FBI	0022	0014		0658 0707
FBICHK	0002	0296		
FBO	002E	0025		0495 0514 0523 0606 0622 0627 0634 0635 0636 0688 0689 0690 0694 0695 0698 0703
FBOCHK	0008	0294		
FCT	0036	0027		0517 0526 0664
FF	00FF	0386		0563 0572 0613 0671
FFLG	001F	0070		
FHF	0027	0023		0674
FILEODD	0004	0241		0616
FILEXCHK	0010	0293		
FINCHXFR	0040	0302		
FIXDDCF	0020	0303		
FI1	002A	0033		
FLAG	0015	0060		0538 0561 0563 0572 0574
FMTERASE	0070	0138		
FMTG1	0040	0135		
FMTG2	0060	0137		
FMTG3	0050	0136		
FMTWR	0040	0333		
FORCERST	0020	0389		
FORCERYC	0020	0220		
FORWARD	0080	0145		
FOTOFI	0004	0222		
FTG	0025	0020		0653 0656 0657 0670 0671 0685 0691
FTI	0035	0011		0668 0669
FTO	0026	0026		0489 0494 0500 0513 0687 0693 0697 0702 0705
FTOCHK	0004	0295		
FTR	002D	0021		0454 0455 0519
GEN1	0009	0046		
HEAD	0018	0063		0475 0495 0545 0694
HES	0028	0012		0673
IDXDDCF	0020	0438		
IDXDDDF	0040	0439		
IDXMK	0002	0196		
IDXP1	0004	0361		

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
IDXP2	0008	0360		
INDEX	0002	0176		0668
INDEXB	0001	0395		
INDEXCH	0003	0396		
INDEXE1	0009	0399		
INDEXE2	000B	0400		
INDEXE3	000D	0401		
INDEXE4	000F	0402		
INDEXF1	0005	0397		
INDEXF2	0007	0398		
INDEXIT	001F	0403		0456 0458
INFCHK	0040	0186		
INTREQD1	0080	0312		
INTREQD2	0040	0313		
INTREQD3	0020	0314		
INTREQD4	0010	0315		
INVPRTY	0002	0252		
IOATTN	0040	0248		
IOCONB	0010	0250		
IOPBUSY	0080	0228		
KCNT	001A	0065		
KDGT256	0002	0372		
LASTREC	0010	0239		
LOSTORT	0020	0201		
LSRCSR	0020	0273		
LSRSELDR	0010	0274		0506
L0	0000	0037		0181 0469 0470 0473 0474 0477 0478 0532 0534 0536 0538
L1	0001	0038		0533 0535 0537 0539
L2	0002	0039		
L3	0003	0040		
L4	0004	0041		
L5	0005	0042		0480 0652 0659 0675
L6	0006	0043		0617 0633 0636
L7	0007	0044		0607 0628 0637 0638 0664
L8	0008	0045		
MIARBB	0018	0405		0452
MIARBD	0018	0406		0453
MIAREB	0014	0407		
MIARED	0014	0408		
MSC1	0013	0058		
MSC2	0014	0059		
MUREC	0020	0359		
MUTRK	0040	0358		
NFILEXFR	0001	0243		0516 0608
NOAM	0008	0211		
NOOP	0008	0326		
NORMEND	0008	0174		0669
NOSYNC	0004	0212		
NREC	001C	0067		
ODDXFER	0001	0308		
ONLINE	0008	0189		0707
OPEND	0010	0325		
PAC	000E	0051		0536 0543
PADTOIDX	0010	0335		
PAH	000F	0052		0537 0545
PHYADDR	0010	0117		
POLLCNTL	0002	0093		
POLLDEV	0082	0092		
PROCDAT	0001	0339		
PROCKEY	0002	0338		
PROCNT	0004	0337		
PROCRO	0008	0336		
QBYT	000C	0049		
RBYT	000D	0050		0479 0484 0550 0556
RCSCHK	0001	0286		
RDCNTL	000A	0102		
RDERROR	0004	0098		
RDGATE	0010	0165		

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
RDG1	0040	0126		0514
RDG2	0060	0128		0627
RDG3	0050	0127		
RDG3AH	0070	0129		0523
RDG4	0030	0125		0617 0622
RDSNS	0080	0357		
RDSTATUS	0084	0096		0705
READ	0080	0343		
READOP	000E	0105		0513
REC	0019	0064		0539 0550 0555 0556
RECYCLE	0040	0291		
RESPONSE	0008	0221		0670 0671
REZERO	0002	0153		
RG1UNORT	0002	0203		
RSTATTN	0004	0151		
RSTRDWR	0005	0099		0489
RWCHK	0010	0188		
RWCTRL	0007	0162		
ROCTODF	0080	0332		
SB0	003F	0030		
SB1	0037	0031		
SCANEQUL	0040	0324		
SCANHI	0040	0237		
SCANRD	0080	0236		
SCANSW	0080	0367		
SCN	002F	0022		0516 0525 0608 0616 0663 0672
SCNEQ	0002	0262		
SCNSAT	0004	0261		
SCNSPLIT	0020	0238		
SDH	001D	0068		0534 0562 0571 0575
SDL	001E	0069		0535 0576 0586 0613 0614 0615 0634 0637
SELACT	0080	0170		
SELCNTL	0003	0095		
SELDEV	0083	0094		0687
SELHOLD	0040	0219		0691
SENSTAT0	0003	0156		
SENSTAT1	0083	0157		
SENSTAT2	0043	0158		
SENSTAT3	0023	0159		
SENSTAT4	0013	0160		
SETDIFF	008C	0110		0697
SETHAR	0088	0109		0494 0693
SETRDWR	0085	0097		0500
SETRWON	0004	0306		
SETUNSUP	0001	0091		
SIZE12	0004	0371		
SKCMPL	0001	0328		
SKDONE	0001	0192		0707
SKSTART	0008	0150		0703
SNSDIFF	0009	0154		
SNSHAR	0005	0155		
SNSINFC	0089	0107		
SNSRDWR	000B	0161		
SPFMTG1	00C0	0140		
SPFMTG2	00E0	0141		
SPRDG2	00E0	0130		0633
SPRESET	0080	0257		
SRCH	0040	0344		
STACKCMD	0080	0301		
STAT	0008	0048		
STATOVN	0008	0202		
SUBTRACT	0002	0277		
SVPREQ	0002	0391		
SYNCIN	0004	0175		
SYNCOUT	0080	0290		
TAGATE	0080	0218		0653
TAGVALID	0040	0171		
TILCHK	0100	0652		0609 0629 0639

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
TILCLKG2	0063	0606		0565 0566
TILCLKG4	006D	0622		0564 0584 0592
TILCOMM0	004D	0573		0567 0571
TILCOMM1	0065	0608		0623
TILCOMM2	0073	0634		0618
TILENTRY	0000	0451		
TILERR01	0112	0676		0457
TILERR02	0113	0677		0544 0546
TILERR03	0114	0678		0668
TILEXIT	005F	0595		0582
TILMV02	005C	0592		0586
TILMV13	0055	0583		0576
TILNOCK	0101	0653		0490 0496 0501 0515 0524 0692 0696 0699 0704 0706
TILNODEF	005D	0593		0574
TILNOSCN	010A	0668		0502 0518 0527
TILRDCNT	002D	0523		0557
TILRDG2	006F	0627		0577 0583 0593 0594
TILRDG22	005E	0594		0585 0591
TILRDG4	0067	0613		0580 0589
TILRECO1	004B	0571		0551
TILRECO2	0058	0586		0575
TILRETRN	0111	0675		0659
TILSEL	0115	0685		0485
TILSKIP2	0048	0565		0561 0562
TILSRDG2	0072	0633		0578 0587
TILSTART	0007	0458		0452 0453
TILSTHAR	001C	0494		0709
TIMEOUT	0020	0292		
TOFILE	0002	0242		
TRKOFL	0001	0363		
TRKOVN	0010	0214		
UNCK	000A	0047		
UNITCHK	0002	0327		
UNSOELCH	0020	0164		
UPDTRDUS	0002	0307		
WHAOK	0008	0346		
WRENABLE	0020	0334		
WRGATE	004C	0163		
WRG2	0020	0134		
WRG4	0080	0139		
WRITE	0020	0345		
WRITEOP	000F	0106		
W0	0010	0072		
W1	0011	0073		
W10	001A	0082		
W11	001B	0083		
W12	001C	0084		
W13	001D	0085		
W14	001E	0086		
W15	001F	0087		
W2	0012	0074		
W3	0013	0075		
W4	0014	0076		
W5	0015	0077		
W6	0016	0078		
W7	0017	0079		
W8	0018	0080		
W9	0019	0081		
XFRDDDF	0008	0305		
XFRHACNT	0010	0304		
XMITCNTL	0009	0101		
ZER	0010	0055		0654 0674 0675 0689 0700
ZLSCH	0017	0427		
ZLSEXTB	000E	0422		
ZLSEXTC	000F	0426		
ZLSEXTE	000D	0423		
ZLSEXTFC	0009	0424		
ZLSEXTFD	000A	0425		

IBM CONFIDENTIAL UNTIL FIRST CUSTOMER SHIP

CROSS-REFERENCE

SYMBOL	VAL.	DEFN	REMARK	CALLS
ZLSFC	0011	0428		
ZLSFCHAN	005B	0435		
ZLSFD	0012	0429		
ZLSLOCB	0006	0419		
ZLSLOCE	0005	0420		
ZLSLOC7	0007	0421		
ZLSRFILE	004A	0433		
ZLSSCHAN	00DD	0436		
ZLSWFILE	00CE	0434		

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
OPTIONS IN EFFECT: BYTEMODE,XREF,NORELOC,NOCARDS,DECK,NODUPE,NOCONTR,NOERRONLY,NODCF3,FL1=OFF,NORLDP
14 CARD-IMAGES OBJECT OUTPUT

LAST P

IBM CONFIDENTIAL UNTIL FIRST CUSTOMER SHIP

OBJECT CARD LISTING

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

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
M80 6 EZS	DZ- D,-GBH6 BH4	HD,= DK ,=" ZY	F DY ,8 D:0 F:D	GU <B: PD:0 F:D	CU &LZHFA600001
M80 6 6 KB:	QD:0 F:D GU MF:	(FHH 24AF&DNBHQ	E FABHE.CH8Q F	AFHEE FAD FHBHD	AF G=RLOFA600002
M80A% 6 UB.+	QFH<&FHQ+BH9I F	ABH@1B.QHD FHBH4	AFH9' FAFH@HF.Q	<D FH DY FH FHF	DMC)J -FA600003
M80BS 6 6 MG	; MC+D4G)DDCN DG	RE%9P &DLA%'Q &D	LA_V(F&A.B'UBA_V	(& _FVNHAV5HB(P	¬D C_=AOFA600004
M80CQ 6 AH C	T CTD A(GV5(B(P	¬8¬<DBVN)G55QF59	N C? C2D CXD A	¬ C?D C_ A:F59	* C2KQ<HA600005
M80D+ 6 AED C	X A:D C_ C? C	?FW(¬D:0 BH< A	SBH8-BH¬"FH@A D	F_#"F'8AG59,F:@	DFHQ03L%FA600006
M80ED 6 A% A	3FH80D AVFH9-BH¬	" D BH$-CH8;B+8	)G;9FGH*;F@¬" D	A9 A:D A# A	@D A'*,*FA600007
M80E: F A=D A	= A"&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA 50DFA600008
M80< 6 D BHO	F:O B' -F-DBF;M	&B+N>CHH FDMJF;@	HG.QG&XMMCGMHF;M	HB+P7BH@ F%)C:)	&CHO&RBUFA600009
M80<6 6 DK D	KD DL DMBHM FHE	CFH8 G>8&B>8AF;N	FABHE.CH8QB::	FAFHE<CH8P F	AB' -7/%FA600010
M80(% 0 DUF-D	TFHE)BH8H FABHE	D FA >HI &DZ	* D_ D>D D? D	OD D:D D2 D3&DA	&DA 2LDFA600011
M1MA &DA &DA &DA	&DA &DA &DA &DA	&F(DKHI &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA :&MFA600012
E"'*%E7*=¬DC"PH$	="7M&F) I C	F% ASC R A	SO Q	16040608730	93075=Y%FA600999

LAST PAGE

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                            2 *
   0000                     3 BEGIN  START 0
                            4        DECK  4
                            5        SEQ   0
                            6        TREP
                    0001    7 XR1    EQU   1
                    0002    8 XR2    EQU   2
                    0008    9 ARR    EQU   8
                    0010   10 IAR    EQU   16
```

INDEX REGISTER 1.
INDEX REGISTER 2.
ADDRESS RECALL REGISTER.
INSTRUCTION ADDRESS REGISTER.


```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                           12 *
                           13 *------ LOADER PROGRAM ----------------------------------------
                           14 *
                           15        ORG   X'3000'
                           16 *
                           17 *------ INITIALIZATION ------------------------------------------
                           18 *
   3000 C0 80 0000         19 LOADER BC    X'0000',X'80'     SET ARR DURING HARD IPL
   3004 35 01 0001         20        L     X'0001',XR1       SAVE LOCATION 0
   3008 34 10 0001         21        ST    X'0001',IAR       PUT IAR IN LOCATION 0
                           22
                   300C    23        USING LOADPT,XR2        ESTABLISH INITIAL BASE REGISTER
                           24
   300C 35 02 0001         25 LOADPT L     X'0001',XR2       LOAD BASE REGISTER
   3010 34 01 0001         26
                           27        ST    X'0001',XR1       RESTORE LOCATION 0
                           28
                   3036    29        USING LOAD02,XR1        ESTABLISH SECOND BASE REGISTER
                           30
   3014 E2 01 2A           31        LA    LOAD02(,XR2),XR1  LOAD BASE REGISTER
   3017 74 02 69           32
                           33        ST    SAVXR2(,XR1),XR2  SAVE LOAD POINT VALUE
                           34
                   0002    35        DROP  XR2               DROP INITIAL BASE REGISTER
                   3135    36        USING LOAD02+255,XR2    ESTABLISH FINAL BASE REGISTER
                           37
   301A D2 02 FF           38        LA    LOAD02+255(,XR1),XR2 LOAD BASE REGISTER
                           39
   301D B4 08 81           40        ST    RETURN(,XR2),ARR  SAVE IPL RETURN ADDRESS
                           41
   3020 9E 01 6F 69        42        ALC   MIC@(2,XR2),SAVXR2(,XR1) ADJUST
   3024 9E 01 71 69        43        ALC   EMIC@(2,XR2),SAVXR2(,XR1)  ADDRESS
   3028 9E 01 75 69        44        ALC   DDDR(2,XR2),SAVXR2(,XR1)     CONSTANTS
   302C 9E 01 73 69        45        ALC   DDCR(2,XR2),SAVXR2(,XR1)
                           46
   3030 74 02 69           47        ST    SAVXR2(,XR1),XR2  SAVE BASE
   3033 B4 01 8D           48        ST    SAVXR1(,XR2),XR1    REGISTERS
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              50 *
                              51 *------  MAIN 'LOADER' PROGRAM ----------------------------------------
                              52 *
  3036 B1 C5 92               53 LOAD02 LIO   HLTIOP(,XR2),X'C5'    HALT IOP
  3039 B1 C5 CA               54        LIO   SERMOD(,XR2),X'C5'    SET SERVICE MODE
                              55
  303C B5 01 6F               56 LOAD03 L     MICA(,XR2),XR1        XR1 --> CURRENT MICRO WORD
  303F 9C 02 87 02            57        MVC   EWORD(3,XR2),2(,XR1)  MOVE NEXT WORD TO EWORD
  3043 B5 01 8D               58        L     SAVXR1(,XR2),XR1      RESTORE XR1
                              59
  3046 AC 00 93 85            60        MVC   STC(1,XR2),EWORD-2(,XR2)
  304A AC 00 95 86            61        MVC   STCR(1,XR2),EWORD-1(,XR2) MOVE WORD TO STORE CMDS
  304E AC 00 97 87            62        MVC   STY(1,XR2),EWORD(,XR2)
                              63
  3052 B1 C5 9A               64        LIO   CSAR9+1(,XR2),X'C5'   LOAD CSAR VALUE
  3055 B1 C5 9C               65        LIO   CSAR8+1(,XR2),X'C5'     IN OPREG
  3058 B1 C5 9E               66        LIO   YTOD(,XR2),X'C5'      Y FIELD -> A REG -> D REG
  305B B1 C5 A0               67        LIO   STCSAR(,XR2),X'C5'    R FIELD & D REG -> CSAR
  305E B8 60 93               68        SBF   STC(,XR2),X'60'       RESET INVERT & UNUSED BITS
  3061 B1 C5 94               69 LOAD04 LIO   STC+1(,XR2),X'C5'     LOAD C FIELD IN OPREG
  3064 B1 C5 96               70        LIO   STCR+1(,XR2),X'C5'    LOAD CR FIELD IN OPREG
  3067 B1 C5 98               71        LIO   STY+1(,XR2),X'C5'     LOAD Y FILED IN OPREG
  306A B1 C5 A2               72        LIO   STLEFT(,XR2),X'C5'    STORE OPREG LEFT
  306D B1 C5 A4               73        LIO   STRIGH(,XR2),X'C5'    STORE OPREG LEFT
  3070 B1 C5 A6               74        LIO   RDCS(,XR2),X'C5'      FETCH CS TO OPREG
  3073 B1 C7 98               75        LIO   STY+1(,XR2),X'C7'     SET LAC TO SENSE OPREG Y FIELD
  3076 B0 C7 8B               76        SNS   RWORD(,XR2),X'C7'     SENSE Y FIELD
  3079 B1 C7 96               77        LIO   STCR+1(,XR2),X'C7'    SET LAC TO SENSE OPREG CR FIELD
  307C B0 C7 8A               78        SNS   RWORD-1(,XR2),X'C7'   SENSE CR FIELD
  307F B1 C7 94               79        LIO   STC+1(,XR2),X'C7'     SET LAC TO SENSE OPREG C FIELD
  3082 B0 C7 89               80        SNS   RWORD-2(,XR2),X'C7'   SENSE C FIELD
                              81
  3085 B8 E0 85               82        SBF   EWORD-2(,XR2),X'E0'   RESET
  3088 B8 E0 89               83        SBF   RWORD-2(,XR2),X'E0'     UNUSED BITS
                              84
  308B AD 02 87 8B            85        CLC   EWORD(3,XR2),RWORD(,XR2) CHECK RESULTS
  308F F2 81 0E               86        JE    LOAD05                GO IF RESULTS MATCH
                              87
  3092 B9 A0 93               88        TBF   STC(,XR2),X'A0'       CHECK FOR DATA MODE OR INVERT ON
  3095 E0 90 12               89        BF    ERROR(,XR2)             GO IF EITHER ON
                              90
  3098 BA 20 93               91        SBN   STC(,XR2),X'20'       SET INVERT BIT
  3098 D0 87 2B               92        B     LOAD04(,XR1)          GO RETRY STORE TO CS
                              93
                              94 *
                              95 *------  CONSTANTS IN XR1 CSECT ---------------------------------------
                              96 *
  309E 0000          309F     97 SAVXR2 DC    XL2'000'
                              98
  30A0 AE 00 99 67            99 LOAD05 ALC   CSARD(1,XR2),I1(,XR2) BUMP CSAR-D
  30A4 BD 80 99              100        CLI   CSARD(,XR2),X'80'     CHECK FOR END OF BLOCK
  30A7 F2 82 13              101        JL    LOAD06                  GO IF NOT
                             102
  30AA BC 00 99              103        MVI   CSARD(,XR2),X'00'     SET CSAR-D TO X'00'
  30AD AE 00 9B 67           104        ALC   CSARB(1,XR2),I1(,XR2) BUMP CSAR-D
  30B1 BD 20 9B              105        CLI   CSARB(,XR2),X'20'     CHECK FOR END OF CS
  30B4 F2 82 06              106        JL    LOAD06                  GO IF NOT
                             107
  30B7 BC 02 90              108        MVI   FLAG(,XR2),2          SET FUNCTIONAL CODE LOADED FLAG
  30BA BC 00 9B              109        MVI   CSARB(,XR2),X'00'     SET CSAR-B TO X'00'
                             110
  30BD AE 01 6F 6B           111 LOAD06 ALC   MICA(2,XR2),I3(,XR2)  UPDATE MICRO WORD POINTER
  30C1 AD 01 6F 71           112        CLC   MICA(2,XR2),EMICA(,XR2) CHECK FOR END OF MICRO WORDS
  30C5 D0 04 06              113        BNH   LOAD03(,XR1)            GO IF NOT
                             114
  30C8 B5 01 6F              115        L     MICA(,XR2),XR1        XR1 --> UNUSED PART OF MICRO WORD
  30CB 9C 02 84 02           116        MVC   WORK(3,XR2),2(,XR1)   SAVE UNUSED PART OF MICRO WORD
  30CF AE 01 6F 6D           117        ALC   MICA(2,XR2),IM512(,XR2) MOVE POINTER BACK 512 BYTES
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  30D3 B5 01 6F              118        L     MICA(,XR2),XR1        XR1 --> NEW POSITION
  30D6 6C 02 02 84           119        MVC   2(3,XR1),WORK(,XR2)   MOVE UNUSED PART OF MICRO WORD
                             120
  30DA E2 01 A9              121        LA    START(,XR2),XR1       XR1 --> START IOP STRING
  30DD E0 87 4E              122        B     SVPXEQ(,XR2)            EXECUTE STRING
                             123
  30E0 B1 C7 69              124        LIO   TEST2(,XR2),X'C7'     SET LAR TO X'02'
  30E3 90 C7 8F              125        SNS   SENSE(,XR2),X'C7'     GET ATTACHMENT SENSE
  30E6 B8 02 8F              126        TBN   SENSE(,XR2),X'02'     CHECK FOR IOP NOT STARTED
  30E9 E0 10 12              127        BT    ERROR(,XR2)             GO IF NOT
                             128
  30EC BD 02 90              129 STEPTP CLI   FLAG(,XR2),2          CHECK FUNCTIONAL CODE LOADED
  30EF F2 81 5C              130        JE    LOAD10                  GO IF YES
                             131
  30F2 BD 00 90              132        CLI   FLAG(,XR2),0          CHECK FOR INITIAL ENTRY FLAG
  30F5 F2 01 06              133        JNE   LOAD07                  GO IF NOT
  30F8 BC 2A 99              134        MVI   CSARD(,XR2),X'2A'     RESET CSAR-D TO 170 MICRO INST'S
  30FB BC 01 9D              135        MVI   FLAG(,XR2),1          RESET FLAG
  30FE E2 01 EB              136 LOAD07 LA    CARREQ(,XR2),XR1      XR1 --> CAR REQUEST STRING
  3101 E0 87 32              137        B     PCRXEQ(,XR2)          WAIT FOR PCR/SET SVP & CAR TO X-REG
                             138
  3104 E2 01 ED              139        LA    HARREQ(,XR2),XR1      XR1 --> HAR REQUEST STRING
  3107 E0 87 32              140        B     PCRXEQ(,XR2)          WAIT FOR PCR/SET SVP & HAR TO X-REG
                             141
  310A B1 C4 75              142        LIO   DDDR(,XR2),X'C4'      LOAD DDDR
  310D B0 C4 8F              143        SNS   SENSE(,XR2),X'C4'     FETCH DDDR
  3110 AD 01 75 8F           144        CLC   DDDR(2,XR2),SENSE(,XR2) CHECK THAT DDDR WAS LOADED
  3114 E0 01 12              145        BNE   ERROR(,XR2)             GO IF NOT
                             146
  3117 E2 01 EF              147        LA    RECREQ(,XR2),XR1      XR1 --> REC REQUEST STRING
  311A E0 87 32              148        B     PCRXEQ(,XR2)          WAIT FOR PCR/SET SVP & REC TO X-REG
                             149
  311D AE 00 EF 69           150        ALC   RECREQ(1,XR2),I2(,XR2) BUMP RECORD NUMBER
  3121 BD 19 EF              151        CLI   RECREQ(,XR2),25       CHECK FOR END OF EVEN TRACK
  3124 F2 01 03              152        JNE   LOAD08                  GO IF NOT
  3127 BA 01 ED              153        SBN   HARREQ(,XR2),X'01'    SET HAR TO ODD TRACK
                             154
  312A AC 01 84 65           155 LOAD08 MVC   WORK(2,XR2),IO(,XR2)  RESET TIMER
  312E AE 01 84 69           156 LOAD09 ALC   WORK(2,XR2),I2(,XR2)  BUMP TIMER
  3132 E0 81 12              157        BZ    ERROR(,XR2)           GO IF TIMER TIMES OUT
  3135 B1 C7 69              158        LIO   PCRREQ(,XR2),X'C7'    FETCH PCR
  3138 B0 C7 8F              159        SNS   SENSE(,XR2),X'C7'       REQUEST
  313B B8 01 8F              160        TBN   SENSE(,XR2),X'01'     CHECK FOR PCR REQUEST
  313E D0 10 F8              161        BT    LOAD09(,XR1)            GO IF NOT
  3141 B1 C5 67              162        LIO   PCRRST(,XR2),X'C5'    RESET PCR REQUEST
  3144 D0 87 00              163        B     LOAD02(,XR1)          CONTINUE
                             164
  3147 AD 01 81 65           165 ERROR  CLC   RETURN(,XR2),IO(,XR2) CHECK FOR HARD IPL
  314B E0 81 26              166        BE    ERRHLT(,XR2)          GO TO ERROR HALT IF YES
                             167
  314E AD 01 81 65           168 LOAD10 CLC   RETURN(,XR2),IO(,XR2) CHECK FOR HARD IPL
  3152 F2 81 D9              169        JE    LOAD11                  GO IF YES
  3155 B5 01 81              170        L     RETURN(,XR2),XR1      XR1 --> SOFT IPL RETURN POINT
  3158 D0 87 00              171        B     0(,XR1)               RETURN TO SOFT IPL
                             172
  315B E2 01 D3              173 ERRHLT LA    STOP(,XR2),XR1        SET UP TO RESET ATTACHMENT
  315E E0 87 4E              174        B     SVPXEQ(,XR2)          BUSY IF ERROR HALT OCCURS
                             175
  3161 F0 03 10              176        HPL   X'10',X'03'           HALT '1-' ON HARD IPL ERROR
  3164 E0 87 2C              177        B     *-3(,XR2)             LOOP ON '1-' HALT
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          179 *
                          180 *------  PCR REQUEST EXECUTOR ----------------------------------------
                          181 *
3167 B4 08 4D             182 PCRXEQ ST    PCRRTN+3(,XR2),ARR     SAVE RETURN ADDRESS
316A B1 C7 69             183 PCR01  LIO   PCRREQ(,XR2),X'C7'    FETCH PCR
                          184        SNS   SENSE(,XR2),X'C7'      REQUEST
316D B0 C7 8F             185        TBN   SENSE(,XR2),X'01'    CHECK FOR PCR REQUEST
3170 B8 01 8F             186        BT    PCR01(,XR2)            GO IF NOT
3173 E0 10 35             187        LIO   1(,XR1),X'C5'        RESET PCR & DATA TO X-REG
3176 71 C5 01             188        LIO   SVPREQ(,XR2),X'C5'   SET SVP REQUEST
3179 81 C5 6B             189        L     SAVXR1(,XR2),XR1     RESTORE XR1
317C 85 01 8D             190 PCRRTN B     *-*                  RETURN
317F C0 87 0000           191 *
                          192 *------  SVP EXECUTOR ------------------------------------------------
                          193 *
3183 B4 08 63             194 SVPXEQ ST    SVPRTN+3(,XR2),ARR     SAVE RETURN ADDRESS
                          195
3186 71 C5 01             196 SVP01  LIO   1(,XR1),X'C5'          EXECUTE DIAG LIO-1
3189 78 80 01             197        TBN   1(,XR1),X'80'          CHECK FOR END OF TABLE
318C D2 01 02             198        LA    2(,XR1),XR1            BUMP POINTER
318F E0 90 51             199        BF    SVP01(,XR2)            CONTINUE
                          200
3192 85 01 8D             201        L     SAVXR1(,XR2),XR1       RESTORE XR1
3195 C0 87 0000           202 SVPRTN B     *-*                    RETURN
                          203 *
                          204 *------  CONSTANTS ---------------------------------------------------
                          205 *
3199 0000           319A  206 I0       DC    IL2'0'
3198 0001           319C  207 I1       DC    IL2'1'
319D 0002           319E  208 I2       DC    IL2'2'
319F 0003           31A0  209 I3       DC    IL2'3'
31A1 FE00           31A2  210 IM512    DC    IL2'-512'
31A3 0288           31A4  211 MIC@     DC    AL2(PRIMIC-LOADPT)
31A5 04A1           31A6  212 EMIC@    DC    AL2(MIC+509-LOADPT)
31A7 019F           31A8  213 DDCR     DC    AL2(DDCF-LOADPT)
31A9 02A4           31AA  214 DDDR     DC    AL2(MIC-LOADPT)
                    31AB  215 DDCF     EQU   *
31AB 00C0000000300001 31B4 216         DC    XL10'00C0000000300001000'
31B3 0000                 216
31B5 0000           31B6  217 RETURN   DC    XL2'0000'
31B7                31B9  218 WORK     DS    XL3
31BA 000000         31BC  219 EWORD    DC    XL3'000000'
31BD 00000000       31C0  220 RWORD    DC    XL4'00000000'
31C1 0000           31C2  221 SAVXR1   DC    XL2'0000'
31C3 0000           31C4  222 SENSE    DC    XL2'0000'
                    319E  223 TEST2    EQU   I2
31C5 00             31C5  224 FLAG     DC    XL1'00'
31C6 8802           31C7  225 HLTIOP   DC    XL2'8802'
31C8 00             31C8  226 STC      DC    XL1'00'
31C9 08             31C9  227          DC    XL1'08'
31CA 00             31CA  228 STCR     DC    XL1'00'
31CB 0A             31CB  229          DC    XL1'0A'
31CC 00             31CC  230 STY      DC    XL1'0C'
31CD 0B             31CD  231          DC    XL1'0B'
31CE 00             31CE  232 CSARD    DC    XL1'00'
31CF 0B             31CF  233          DC    XL1'0B'
31D0 00             31D0  234 CSARB    DC    XL1'00'
31D1 0A             31D1  235          DC    XL1'0A'
31D2 020F           31D3  236 YTOD     DC    XL2'020F'
31D4 080D           31D5  237 STCSAR   DC    XL2'080D'
31D6 AE0E           31D7  238 STLEFT   DC    XL2'AE0E'
31D8 CE0E           31D9  239 STRIGH   DC    XL2'CE0E'
31DA 0E0E           31DB  240 RDCS     DC    XL2'0E0E'
31DC 8001           31DD  241 RD12MB   DC    XL2'8001'
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          243 *
                          244 *------  START IOP STRING --------------------------------------------
                          245 *
31DE 1208           31DE  246 START  EQU   *
31E0 8F0A           31DF  247        DC    XL2'1208'          C=X'12'
31E2 8F08           31E1  248        DC    XL2'8F0A'          CR=X'BF'      SADI  INDEXIT,X'BF'
31E4 8802           31E3  249        DC    XL2'8F08'          Y=X'BF'
31E6 000F           31E5  250        DC    XL2'8802'          RESET SERVICE MODE
31E8 A802           31E7  251        DC    XL2'000F'          EXECUTE INSTRUCTION
31EA 880E           31E9  252        DC    XL2'A802'          SET SERVICE MODE
31EC 1208           31EB  253        DC    XL2'880E'          INDEX=X'BF'
31EE 940A           31ED  254        DC    XL2'1208'          C=X'12'
31F0 0008           31EF  255        DC    XL2'940A'          CR=X'94'      SABI  MIAREB,X'00'
31F2 8802           31F1  256        DC    XL2'0008'          Y=X'00'
31F4 000F           31F3  257        DC    XL2'8802'          RESET SERVICE MODE
31F6 A802           31F5  258        DC    XL2'000F'          EXECUTE INSTRUCTION
31F8 840A           31F7  259        DC    XL2'A802'          SET SERVICE MODE
31FA 8802           31F9  260        DC    XL2'840A'          CR=X'84'      SADI  MIARED,X'00'
31FC 000F           31FB  261        DC    XL2'8802'          RESET SERVICE MODE
31FE A802           31FD  262        DC    XL2'000F'          EXECUTE INSTRUCTION
3200 0C0E           31FF  263 SERMOD DC    XL2'A802'          SET SERVICE MODE
3202 0002           3201  264        DC    XL2'0C0E'          RESET EXT ADR CHECK/READ 1 INSTRUCTION
3204 0001           3203  265        DC    XL2'0002'          RESET K REG
3206 008E           3205  266        DC    XL2'0001'          RESET X REG
                    3207  267        DC    XL2'008E'          START IOP/END OF STRING
                          268 *
                          269 *------  STOP IOP AND DE-ACTIVATE ATTACHMENT BUSY ON ERROR CONDITION --
                          270 *
3208 A802           3208  271 STOP   EQU   *
320A 1808           3209  272        DC    XL2'A802'          SERVICE MODE AND HALT IOP
320C A30A           320B  273        DC    XL2'1808'          C=X'18'
320E 800B           320D  274        DC    XL2'A30A'          CR=X'A3'      LBI TO DST REG
3210 8802           320F  275        DC    XL2'800B'          Y=X'80'
3212 008F           3211  276        DC    XL2'8802'          RESET SERVICE MODE
                    3213  277        DC    XL2'008F'          EXECUTE LBI INST TO RESET ATT BUSY
                                                              AND HALT THE IOP/END OF STRING
                          278 *
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          280 *
                          281 *------  SET PCR REQUEST  ----------------------------------------
                          282 *
                    319E  283 PCRREQ EQU   I2                  FETCH PCR REQUEST
                          284 *
                          285 *------  RESET PCR REQUEST  --------------------------------------
                          286 *
                    319C  287 PCRRST EQU   I1                  RESET PCR REQUEST
                          288 *
                          289 *------  SET SVP REQUEST  ----------------------------------------
                          290 *
                    31A0  291 SVPREQ EQU   I3                  SET SVP REQUEST
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                          293 *-------------------------------------------------------------------*
                          294 *                                                                   *
                          295 *     WARNING:  THE 3340 DISK IPL FORMATTER (PID=FC2) DEPENDS       *
                          296 *               ON CARREQ AND HARREQ BEING AT THIS SPECIFIC         *
                          297 *               LOCATION.                                           *
                          298 *                                                                   *
                          299 *-------------------------------------------------------------------*
                          300         ORG   LOADER+X'0220'
                          301 *
                          302 *------  CAR REQUEST STRING  -------------------------------------
                          303 *
                    3220  304 CARREQ EQU   *
                    3221  305         DC    XL2'0001'            RESET PCR/SET X-REG FOR CYLINDER 0
                          306 *
                          307 *------  HAR REQUEST STRING  -------------------------------------
                          308 *
                    3222  309 HARREQ EQU   *
                    3223  310         DC    XL2'0401'            RESET PCR/SET X-REG FOR HEAD 2
                          311 *
                          312 *------  REC REQUEST STRING  -------------------------------------
                          313 *
                    3224  314 RECREQ EQU   *
                    3225  315         DC    XL2'0101'            RESET PCR/SET X-REG FOR RECORD
```

3220

3220 0001

3222 0401

3224 0101

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         317 *
                         318 *------  HARD IPL  ----------------------------------------
                         319 *
                         320          ORG   LOAD02+255+249
                  0001   321          DROP  XR1                 DROP LOADER BASE REGISTER
                         322
                  322E   323          USING LOAD11,XR1          ESTABLISH HARD IPL BASE REGISTER
                         324
  322E E2 01 F9          325 LOAD11   LA    LOAD11(,XR2),XR1   LOAD NEW BASE REGISTER
  3231 AC 01 75 65       326          MVC   DDDR(2,XR2),IO(,XR2) SET DDDR TO LOCATION 0
  3235 B1 C4 75          327          LIO   DDDR(,XR2),X'C4'   LOAD DDDR
  3238 B1 C6 73          328          LIO   DDCR(,XR2),X'C6'   LOAD DDCR
  323B B0 C4 8F          329          SNS   SENSE(,XR2),X'C4'  SENSE DDDR
  323E B0 C6 8D          330          SNS   SENSE-2(,XR2),X'C6' SENSE DDCR
  3241 AD 03 75 8F       331          CLC   DDDR(4,XR2),SENSE(,XR2) CHECK THAT REGISTERS WERE LOADED
  3245 E0 01 26          332          BNE   ERRHLT(,XR2)       GO TO ERROR HALT IF NOT
                         333
  3248 7C C1 50          334          MVI   DRIVE1+1(,XR1),X'C1' SETUP
  324B 7C 07 51          335          MVI   DRIVE1+2(,XR1),X'07'   RD DIAG SNS SIO
                         336
  324E D0 87 49          337          B     DRVXEQ(,XR1)       EXECUTE SIO
                         338
  3251 39 07 0002        339          TBF   X'0002',X'07'      TEST FOR 12 MB DATA MODULE
  3255 F2 90 06          340          JF    LOAD12               GO IF NOT 12 MB
                         341
  3258 B1 C5 A8          342          LIO   RD12MB(,XR2),X'C5' SET OPTION BYTE FOR 12 MB
  325B B1 C5 68          343          LIO   SVPREQ(,XR2),X'C5'   AND SET SVP REQUEST FL
                         344
  325E B1 C4 75          345 LOAD12   LIO   DDDR(,XR2),X'C4'     RESTORE DDDR
                         346
  3261 7C C0 5C          347          MVI   DRIVE1+1(,XR1),X'C0' SETUP
  3264 7C 01 51          348          MVI   DRIVE1+2(,XR1),X'01'   RECAL SIO
                         349
  3267 D0 87 49          350          B     DRVXEQ(,XR1)       EXECUTE SIO
                         351
  326A 7C C1 50          352          MVI   DRIVE1+1(,XR1),X'C1' SETUP
  326D 7C 00 51          353          MVI   DRIVE1+2(,XR1),X'00'   RDKD SIO
                         354
  3270 D0 87 49          355          B     DRVXEQ(,XR1)       EXECUTE SIO
                         356
  3273 C0 87 0000        357 LOADX    B     X'0000'              CONTINUE IPL AT LOCATION X'0000'
                         358
  3277 74 08 66          359 DRVXEQ   ST    DRVRTN+3(,XR1),ARR SAVE RETURN ADDRESS
  327A E1 C0 26          360          TIO   ERRHLT(,XR2),X'C0' ERROR HALT IF UNIT CHECK/NOT READY
                         361
  327D F3 00 00          362 DRIVE1   SIO   *-*,*-*             EXECUTE SIO
                         363
  3280 AC 01 84 65       364          MVC   WORK(2,XR2),IO(,XR2) RESET TIMER
  3284 AE 01 84 67       365          ALC   WORK(2,XR2),I1(,XR2) BUMP TIMER
  3288 E0 81 26          366          BZ    ERRHLT(,XR2)       ERROR HALT IF TIMER RUNS OUT
  328B D1 C2 56          367          TIO   *-7(,XR1),X'C2'    GO IF ATTACHMENT BUSY STILL ON
  328E E1 C0 26          368          TIO   ERRHLT(,XR2),X'C0' ERROR HALT IF UNIT CHECK/NOT READY
                         369
  3291 C0 87 0000        370 DRVRTN   B     *-*                RETURN
                         371
```



```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         373 *
                         374 *------  MINI MICRO LOADER  -------------------------------
                         375 *
                         376          ORG   LOADER+660
  3294                   377 PRIMIC   EQU   *
  32AF                   378          DS    28XL1
  32B0                   379 MIC      EQU   *
  34AF                   380          DS    512XL1
  0000                   381          END   BEGIN
```

FA71 3340 DISK IPL LOADER PROGRAM--MOD 12

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
ARR	C	001	0008	0009	0040 0182 0194 0359
BEGIN	A	001	0000	0003	0381
CARREQ	A	001	3220	0304	0136
CSARB	A	001	31D0	0234	0065 0104* 0105 0109*
CSARD	A	001	31CE	0232	0064 0099* 0100 0103* 0134*
DDCF	A	001	31AB	0215	0213
DDCR	A	002	31A8	0213	0045* 0328
DDDR	A	002	31AA	0214	0044* 0142 0144 0326* 0327 0331 0345
DRIVE1	A	003	327D	0362	0334* 0335* 0347* 0348* 0352* 0353*
DRVRTN	A	004	3291	0370	0359*
DRVXEQ	A	003	3277	0359	0337 0350 0355
EMIC@	A	002	31A6	0212	0043* 0112
ERRHLT	A	003	315B	0173	0166 0332 0360 0366 0368
ERROR	A	004	3147	0165	0089 0127 0145 0157
EWORD	A	003	31BC	0219	0057* 0060 0061 0062 0082* 0085
FLAG	A	001	31C5	0224	0108* 0129 0132 0135*
HARREQ	A	001	3222	0309	0139 0153*
HLTIOP	A	002	31C7	0225	0053
IAR	C	001	0010	0010	0021
IM512	A	002	31A2	0210	0117
I0	A	002	319A	0206	0155 0165 0168 0326 0364
I1	A	002	319C	0207	0099 0104 0287 0365
I2	A	002	319E	0208	0150 0156 0223 0283
I3	A	002	31A0	0209	0111 0291
LOADER	A	004	3000	0019	0300 0376
LOADPT	A	004	300C	0025	0023 0211 0212 0213 0214
LOADX	A	004	3273	0357	
LOAD02	A	003	3036	0053	0029 0031 0036 0038 0163 0320
LOAD03	A	003	303C	0056	0113
LOAD04	A	003	3061	0069	0092
LOAD05	A	004	30A0	0099	0086
LOAD06	A	004	30BD	0111	0101 0106
LOAD07	A	003	30FE	0136	0133
LOAD08	A	004	312A	0155	0152
LOAD09	A	004	312E	0156	0161
LOAD10	A	004	314E	0168	0130
LOAD11	A	003	322E	0325	0169 0323 0325
LOAD12	A	003	325E	0345	0340
MIC	A	001	32B0	0379	0212 0214
MIC@	A	002	31A4	0211	0042* 0056 0111* 0112 0115 0117* 0118
PCRREQ	A	002	319E	0283	0158 0183
PCRRST	A	002	319C	0287	0162
PCRRTN	A	004	317F	0190	0182*
PCRXEQ	A	003	3167	0182	0137 0140 0148
PCR01	A	003	316A	0183	0186
PRIMIC	A	001	3294	0377	0211
RDCS	A	002	31DB	0240	0074
RD12MB	A	002	31DD	0241	0342
RECREQ	A	001	3224	0314	0147 0150* 0151
RETURN	A	002	3186	0217	0040* 0165 0168 0170
RWORD	A	004	31C0	0220	0076* 0078* 0080* 0083* 0085
SAVXR1	A	002	31C2	0221	0048* 0058 0189 0201
SAVXR2	A	002	309F	0097	0033* 0042 0043 0044 0045 0047*
SENSE	A	002	31C4	0222	0125* 0126 0143* 0144 0159* 0160 0184* 0185 0329* 0330* 0331
SERMOD	A	002	31FF	0263	0054
START	A	001	31DE	0246	0121
STC	A	001	31C8	0226	0060* 0068* 0069 0079 0088 0091*
STCR	A	001	31CA	0228	0061* 0070 0077
STCSAR	A	002	31D5	0237	0067
STEPTP	A	0C3	30EC	0129	
STLEFT	A	002	31D7	0238	0072
STOP	A	001	3208	0271	0173
STRIGH	A	002	31D9	0239	0073
STY	A	001	31CC	0230	0062* 0071 0075
SVPREQ	A	002	31A0	0291	0188 0343
SVPRTN	A	004	3195	0202	0194*

FA71 3340 DISK IPL LOADER PROGRAM--MOD 12

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SVPXEQ	A	003	3183	0194	0122 0174
SVP01	A	003	3186	0196	0199
TEST2	A	002	319E	0223	0124
WORK	A	003	31B9	0218	0116* 0119 0155* 0156* 0364* 0365*
XR1	C	001	0001	0007	0020* 0027 0029 0031* 0033 0038 0042 0043 0044 0045 0047 0048
					0056* 0057 0058* 0092 0113 0115* 0116 0118* 0119 0121* 0136* 0139*
					0147* 0161 0163 0170* 0171 0173* 0187 0189* 0196 0197 0198 0198*
					0201* 0321 0323 0325* 0334 0335 0337 0347 0348 0350 0352 0353
					0355 0359 0367
XR2	C	001	0002	0008	0023 0025* 0031 0033 0035 0036 0038* 0040 0042 0043 0044 0045
					0047 0048 0053 0054 0056 0057 0058 0060 0060 0061 0061 0062
					0062 0064 0065 0066 0067 0068 0069 0070 0071 0072 0073 0074
					0075 0076 0077 0078 0079 0080 0082 0083 0085 0085 0088 0089
					0091 0099 0099 0100 0103 0104 0104 0105 0108 0109 0111 0111
					0112 0112 0115 0116 0117 0117 0118 0119 0121 0122 0124 0125
					0126 0127 0129 0132 0134 0135 0136 0137 0139 0140 0142 0143
					0144 0144 0145 0147 0148 0150 0150 0151 0153 0155 0155 0156
					0156 0157 0158 0159 0160 0162 0165 0165 0166 0168 0168 0170
					0173 0174 0177 0182 0183 0184 0185 0186 0188 0189 0194 0199
					0201 0325 0326 0326 0327 0328 0329 0330 0331 0331 0332 0342
					0343 0345 0360 0364 0364 0365 0365 0366 0368
YTOD	A	002	31D3	0236	0066

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

IBM MAINTENANCE DIAGNOSTIC PROGRAM

FA71 3340 DISK IPL LOADER PROGRAM--MOD 12

OBJECT CARD LISTING

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

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

•GBK•GBD̄•••PN•42  47636•EC•827827•  3340•DISK•IPL•LO  ADER•----•MOD•12  84@@84@@••••••••  ••••••••FA710000
T+T•:OH•••CMA••D  4D••A(&H••L&A••G  S•KZ4•WXK•?=4BHF  ;•O'ZX-E1ĒR¢A)OW  ;•P(Z)•IZ_•F(%*O  K%*M•¬&%FA710001
T+TA52,MA$90B/OH̄  5•Q6%•I+E,•BN/D̄O  •V8;11RD̄11R211R:  11ĒB#QI+11RK11RĒ  11RS11ĒH̄11ĒK11ĒĒ  119-•#1MFA710002
T+TBO%<;.%*;O%<;  H̄%*;M%<;I>=BE>=B  I,&H̄GS"H̄AC,H-U=B  &D,Y-U'BGH̄O••,-B  RR#6•W¬H̄BD#O•WE8  •W6*•3,4FA710003
T+TC,?KB$@YHF?•H̄  &?•B$,-E?Ē:4A$7G  &A•Ē5•O=*•Y&B,-E  ?$$MA$60B•YLS•ĒX  -/4:116W018=8•Y"  -DAH•ĒO@FA710004
T+TDW?&H̄&@YE*?&B  &@-DF?BD̄R?•F&8-G  ,8H*28-G_8H*2%*J  5%<K|,&E5T=•AD>H  A#=BG<D̄8•#6W'F:"  2•&<•2&*FA710005
T+TE/>-G_,•FDRĒ8  A/FX--JH̄116W018=  8•Q"&D|S11O¬&/0B  _•QEV8HDW,&F¢R¬H̄  A6$MA-)BG•+HA4=B  GL?••:ZHFA710006
T+TF*•1C-/224BD6  116W018=8•Q"-DCN  11&F11O>5•Q7•/O•  ••_•/T**MA;H•A4-D  B8IAJ_&F(OH*••••  •••D•@&<FA710007
TFLF6••H••"8••Y-  DY&F¬•D̄&••••••C•  ••&•••••••••••••  ••••••••••••••••  ••••••••••••••••  •••••:AQFA710008
T+TG4•••••••••••  •••••S•H•B••H̄••%  •BO•H̄•-@HCĒ8+3-8  +CY•AD-S"B,@.S•H  •C:-BSO8KBI&H̄••>  H•-••&H8FA710009
TGTHLC:-B_•D̄H•-•  |D̄•H<C-•B••D•TD̄-  BF•STBY•.S•H•TO•  ••••••••••••••••  ••••••••••••••••  •••••@IHFA710010
TALHV••DD•&DA•••  ••••••••••••••••  ••••••••••••••••  ••••••••••••••••  ••••••••••••••••  •••••@C-FA710011
T+TIY8-G9,•E5R$G  D)$GF*#CDT#CFTĒ4  C)Q"-•KR@ONA@A5G  &/4U9AO•B@Z•F%*O  Y%*N,%*J5¬<A&¬•E  J4H*•KH̄8FA710012
TH̄3H̄MKP3AMGO•M)B  GK*bG••A4BF$/OB$  3••B%•QJV,-FDR=8  AI_GBN>G•I%BG•••  ••••••••••••••••  •••••RTDFA710013
E••A*E7*=¬DC"PH$  ="7M&F|•••|•••C•  ••F%•••ASC•••R•A  SO•••Q••••••••••  •••••12330630750  112762•@FA710014
```

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

DATE 21AUG75 05NOV75
EC NO. 827785 827827

```
FC21      3340 IPL FORMAT PROGRAM        --MODEL 12

ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                 2 *                                                       LAST CHG:12 02 75
                                 3          DECK  4
                                 4          SEQ   0
    0000                         5 FC2      START 0
                                 6          TREP
    0A00                         7          ORG   X'A00'
                                 8
                                 9 ************ SECTION PREFACE  ****************************************
                                10
    0A00 FC21             0A01  11          DC    XL2'FC21'           PROGRAM ID
    0A02 00               0A02  12          DC    XL1'0'              SECTION FLAGS
    0A03 00               0A03  13          DC    XL1'0'              CURRENT ROUTINE NUMBER
    0A04 0000             0A05  14          DC    XL2'0'              RESERVED
    0A06 0A3A             0A07  15          DC    AL2(RTN1)           ADDRESS OF FIRST ROUTINE PREFIX
    0A08 FFFF             0A09  16          DC    XL2'FFFF'           RESERVED
    0A0A C15000           0A0C  17 SPUT     DC    XL3'C15000'         SPUT
    0A0D                  0A18  18          DS    XL12
    0A19 00               0A19  19 COM      DC    XL1'00'
    0A1A                  0A1A  20          DS    XL1
    0A1B                  0A1C  21 LDRID    DS    AL2
    0A1D                  0A1E  22 AMOPID   DS    AL2
    0A1F                  0A20  23 FAOID    DS    AL2
                                24 *
    0A21                  0A39  25 SVFFC    DS    XL25                SECTION PREFACE SAVE AREA
```



```
FC21      3340 IPL FORMAT PROGRAM        --MODEL 12

ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                                27 *              ROUTINE NO. 01. UPDATE CYLINDER 0 WITH 3340 MICRO-CODE.
                                28 *                              THIS MICRO INCLUDES FA0. FA6. AND FA7.
                                29 *                              THE UPDATES RESIDE IN THE NORMAL PROGRAM
                                30 *                              AREA OF THE CE DATA MODULE. THIS PROGRAM
                                31 *                              WILL UPDATE CYLINDER 0 OF ANY DATA MODULE
                                32 *                              WITH ANY OR ALL OF THESE PARTS OF THE
                                33 *                              3340 MICRO-CODE.
                                34 *
                                35 *
                                36
                                36
    0A3A 01               0A3A  37 RTN1     DC    XL1'01'             ROUTINE NUMBER
    0A3B 00               0A3B  38          DC    XL1'0'              ROUTINE FLAGS
    0A3C FFFF             0A3D  39          DC    XL2'FFFF'           LAST ROUTINE
                                40
                                41 *
                                42 *        GIVE INFORMATIONAL DISPLAY
                                43 *        *     *                   *
    0A3E 35 01 1A95             44          L     X203.XR1            GET ADDRESS OF CORE SIZE
    0A42 4D 01 00 1A93          45          CLC   0(2.XR1).X8000      IS THIS A 32K MACHINE
    0A47 F2 81 10               46          JE    GO                  YES. DON'T MODIFY FA0 LOCATION
    0A4A 3C 8F 1288             47          MVI   MOD1+2.X'8F'        MODIFY--FA0 NEW LOCATION
    0A4E 3C BF 128A             48          MVI   MOD1+4.X'BF'          "      "    "        "
    0A52 3C 91 16AE             49          MVI   BUFF1@-1.X'91'        "      "    "        "
    0A56 3C 8F 16BC             50          MVI   BUFF2@-1.X'8F'        "      "    "        "
    0A5A C0 87 021A             51 GO       B     PRINT               PRINT RTN
    0A5E 01               0A5E  52          DC    XL1'01'             FLAG
    0A5F 52               0A5F  53          DC    AL1(DISP1A-DISP1)   LENGTH
    0A60 210E             0A61  54          DC    AL2(DISP1A)         @ OF MESSAGE
    0A62 C0 87 021A             55          B     PRINT               PRINT RTN
    0A66 01               0A66  56          DC    XL1'01'             FLAG
    0A67 51               0A67  57          DC    AL1(DISP1B-DISP11)  LENGTH
    0A68 215F             0A69  58          DC    AL2(DISP1B)         @ OF MESSAGE
    0A6A C0 87 021A             59          B     PRINT               PRINT RTN
    0A6E 01               0A6E  60          DC    XL1'01'             FLAG
    0A6F 29               0A6F  61          DC    AL1(DISP1C-DISP12)  LENGTH
    0A70 2188             0A71  62          DC    AL2(DISP1C)         @ OF MESSAGE
    0A72 C0 87 021A             63          B     PRINT               PRINT RTN
    0A76 01               0A76  64          DC    XL1'01'             FLAG
    0A77 28               0A77  65          DC    AL1(DISP1D-DISP13)  LENGTH
    0A78 21B0             0A79  66          DC    AL2(DISP1D)         @ OF MESSAGE
    0A7A C0 87 021A             67          B     PRINT               PRINT RTN
    0A7E 06               0A7E  68          DC    XL1'06'             FLAG
    0A7F 63               0A7F  69          DC    AL1(DISP1E-DISP14)  LENGTH
    0A80 2213             0A81  70          DC    AL2(DISP1E)         @ OF MESSAGE
    0A82 C0 87 021A             71          B     PRINT               PRINT RTN
    0A86 01               0A86  72          DC    XL1'01'             FLAG
    0A87 50               0A87  73          DC    AL1(DISP2A-DISP21)  LENGTH
    0A88 2263             0A89  74          DC    AL2(DISP2A)         @ OF MESSAGE
    0A8A C0 87 021A             75          B     PRINT               PRINT RTN
    0A8E 01               0A8E  76          DC    XL1'01'             FLAG
    0A8F 55               0A8F  77          DC    AL1(DISP2B-DISP22)  LENGTH
    0A90 22B8             0A91  78          DC    AL2(DISP2B)         @ OF MESSAGE
    0A92 C0 87 021A             79          B     PRINT               PRINT RTN
    0A96 01               0A96  80          DC    XL1'01'             FLAG
    0A97 56               0A97  81          DC    AL1(DISP2C-DISP23)  LENGTH
    0A98 230E             0A99  82          DC    AL2(DISP2C)         @ OF MESSAGE
    0A9A C0 87 021A             83          B     PRINT               PRINT RTN
    0A9E 01               0A9E  84          DC    XL1'01'             FLAG
    0A9F 4E               0A9F  85          DC    AL1(DISP2D-DISP24)  LENGTH
    0AA0 235C             0AA1  86          DC    AL2(DISP2D)         @ OF MESSAGE
    0AA2 C0 87 021A             87          B     PRINT               PRINT RTN
    0AA6 06               0AA6  88          DC    XL1'06'             FLAG
    0AA7 5B               0AA7  89          DC    AL1(DISP2E-DISP25)  LENGTH
    0AA8 23B7             0AA9  90          DC    AL2(DISP2E)         @ OF MESSAGE
    0AAA C0 87 0222             91          B     HALT                WAIT FOR DRIVE DATA TO BE ENTER
    0AAE C1E1             0AAF  92          DC    XL2'C1E1'
                                93 *
```

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                           94 *      READ DRIVE # SELECTED INTO 'DRIVE#'
                           95 *
 0AB0 30 00 17D3           96 WTRD#  SNS   WORK,X'00'          SENSE DATA SWITCHES FOR DATA
 0AB4 0C 00 146B 17D3      97        MVC   DRIVE#(1),WORK      MOVE IN SELECTED DRIVE
                           98 *
                           99 *      NOW CHECK FOR A VALID DRIVE (D1OR D2) SELECTED
                          100 *
 0ABA C2 01 16A2          101        LA    DRIVES,XR1
 0ABE 4D 00 00 1468       102 CKDR#  CLC   0(1,XR1),DRIVE#    IS ONE ENTERED IN THE TABLE?
 0AC3 F2 81 1C            103        JE    CK
 0AC6 D2 01 01            104        LA    1(,XR1),XR1        KEEP CHECKING
 0AC9 7D FF 00            105        CLI   0(,XR1),X'FF'
 0ACC C0 01 0ABE          106        BNE   CKDR#
 0AD0 C0 87 021A          107        B     PRINT              DISPLAY 'ER' IF NOT VALID ENTRY
 0AD4 06            0AD4  108        DC    XL1'06'            FLAG
 0AD5 0B            0AD5  109        DC    IL1'11'            LENGTH
 0AD6 1465          0AD7  110        DC    AL2(ERROR)         @ OF MESSAGE
 0AD8 C0 87 0^22          111        B     HALT               DISPLAY HALT
 0ADC C133          0ADD  112        DC    XL2'C133'          ER
 0ADE C0 87 0AB0          113        B     WTRD#              GO BACK AND WAIT FOR VALID ENTRY
                    0AE2  114 OK     EQU   *
                          115 *
                          116 *      WRITE DISPLAY ASKING FOR THE IDS TO BE ENTERED
                          117 *
 0AE2 C0 87 021A          118        B     PRINT              PRINT
 0AE6 01            0AE6  119        DC    XL1'01'            FLAG
 0AE7 50            0AE7  120        DC    AL1(DISP3A-DISP31) LENGTH
 0AE8 2407          0AE9  121        DC    AL2(DISP3A)        @ OF MESSAGE
 0AEA C0 87 021A          122        B     PRINT              PRINT
 0AEE 01            0AEE  123        DC    XL1'01'            FLAG
 0AEF 51            0AEF  124        DC    AL1(DISP3B-DISP32) LENGTH
 0AF0 2458          0AF1  125        DC    AL2(DISP3B)        @ OF MESSAGE
 0AF2 C0 87 021A          126        B     PRINT              PRINT
 0AF6 01            0AF6  127        DC    XL1'01'            FLAG
 0AF7 4F            0AF7  128        DC    AL1(DISP3C-DISP33) LENGTH
 0AF8 24A7          0AF9  129        DC    AL2(DISP3C)        @ OF MESSAGE
 0AFA C0 87 021A          130        B     PRINT              PRINT
 0AFE 01            0AFE  131        DC    XL1'01'            FLAG
 0AFF 54            0AFF  132        DC    AL1(DISP3D-DISP34) LENGTH
 0B00 24FB          0B01  133        DC    AL2(DISP3D)        @ OF MESSAGE
 0B02 C0 87 021A          134        B     PRINT              PRINT
 0B06 01            0B06  135        DC    XL1'01'            FLAG
 0B07 56            0B07  136        DC    AL1(DISP3E-DISP35) LENGTH
 0B08 2551          0B09  137        DC    AL2(DISP3E)        @ OF MESSAGE
 0B0A C0 87 021A          138        B     PRINT              PRINT
 0B0E 06            0B0E  139        DC    XL1'06'            FLAG
 0B0F 29            0B0F  140        DC    AL1(DISP3F-DISP36) LENGTH
 0B10 257A          0B11  141        DC    AL2(DISP3F)        @ OF MESSAGE
 0B12 3C 40 16A0          142        MVI   SVUPDT,X'40'       INITILIZE PROGRAM ID AREA
 0B16 0C 04 169F 16A0     143        MVC   SVUPDT-1(5),SVUPDT  "      "      "   "
 0B1C C2 02 169B          144        LA    SVUPDT-5,XR2       RESTORE THE @ FOR RESTART
 0B20 34 02 17D3          145        ST    WORK,XR2           SAVE THE @
 0B24 0C 01 0B58 17D3     146        MVC   CKIDS1+3(2),WORK   OF PROGRAM IN THE INSTRUCTIONS
 0B2A 0C 01 0B8B 17D3     147        MVC   XXX1+3(2),WORK     THAT HAVE BEEN PREVIOUS MODIFIED.
 0B30 C2 02 169C          148        LA    SVUPDT-4,XR2       SAME AS ABOVE
 0B34 34 02 17D3          149        ST    WCRK,XR2           SAVE THE @
 0B38 0C 01 0BA2 17D3     150        MVC   WTIDS1+3(2),WCRK    "   "   "
 0B3E 38 FF 1449          151        SBF   SWITCH,FF          RESET FIRST TIME SWITCH
 0B42 CC 87 0222          152 WTICS  B     HALT               HALT UNTIL DATA IS ENTERED
 0B46 C1E2          0B47  153        DC    XL2'C1E2'
                          154 *
                          155 *      READ IDS INTO 'SVUPDT'
                          156 *
 0B48 30 00 17D3          157        SNS   WCRK,X'00'         SENSE DATA SWITCHES FOR PGM IDS
 0B4C 0D 01 17D3 1448     158        CLC   WORK(2),FFF        ARE THEY ALL DONE ENTERING PGMS
 0B52 F2 81 66            159        JE    DOPACK             YES,GO PROCESS
                          160 *
                          161 *      NOW CHECK FOR VALID IDS ENTERED
```


FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
                          162 *
 0B55 C2 02 16SB          163 CKIDS1 LA    SVUPDT-5,XR2       XR2 POINTS TO IDS ENTERED BY CE
 0B59 C2 01 16A5          164        LA    IDS,XR1            XR1 POINTS TO VALID POSSIBILITIES
 0B5D 4D 01 01 17D3       165 CKIDS  CLC   1(2,XR1),WORK      IS IT A VALID ENTRY
 0B62 F2 81 1C            166        JE    CKCOMA             IF IT IS, GO CHECK FOR MORE
 0B65 D2 01 02            167        LA    2(,XR1),XR1
 0B68 7D FF 00            168        CLI   0(,XR1),X'FF'
 0B6B C0 01 0B5D          169        BNE   CKIDS              KEEP CHECKING FOR VALID ENTRIES
                          170 *
                          171 *      DISPLAY ERROR IF NOT VALID ENTRY
                          172 *
 0B6F C0 87 021A          173 DISPER B     PRINT              PRINT
 0B73 06            0B73  174        DC    XL1'06'            FLAG
 0B74 0B            0B74  175        DC    IL1'11'            LENGTH
 0B75 1465          0B76  176        DC    AL2(ERROR)         @ OF MESSAGE
 0B77 C0 87 0222          177        B     HALT               PRINT HALT
 0B7B C133          0B7C  178        DC    XL2'C133'          ER
 0B7D C0 87 0B42          179        B     WTIDS               GO WAIT FOR ANOTHER ENTRY
 0B81 38 FF 1449          180 CKCCMA TBN   SWITCH,FF          IF THIS IS THE FIRST ENTRY THEN
 0B85 F2 90 13            181        JF    XXX2               SKIP THIS CHECKING FOR DUP ENTRY
 0B88 C2 02 1698          182 XXX1   LA    SVUPDT-5,XR2       LOAD THE @ OF THE FIRST ENTRY
 0B8C 2D 01 17D3 01       183        CLC   WORK(2),1(,XR2)    COMPARE 1ST ENTRY TO THIS ENTRY
 0B91 C0 81 0B42          184        BE    WTIDS              IF EQUAL THEN RETURN FOR NEW ENTRY
 0B95 0E 00 0B8B 144A     185        ALC   XXX1+3(1),PLUS2    ADJ POINTER FOR NEXT ENTRY @
 0B9B 3A FF 1449          186 XXX2   SBN   SWITCH,FF          TURN ON SWITCH FOR 1ST ENTRY
 0B9F 0C 01 169C 17D3     187 WTICS1 MVC   SVUPDT-4(2),WORK   MOVE IN PGM IDS
 0BA5 0E 00 0BA2 144A     188        ALC   WTICS1+3(1),PLUS2  MODIFY THE INST. FOR NEXT ENTRY POS.
 0BAB 0E 00 0B58 144A     189        ALC   CKIDS1+3(1),PLUS2  MODIFY THE INST. FOR NEXT ENTRY POS.
 0BB1 C0 87 0222          190        B     HALT               ISSUE HALT TO ACKNOWLEDGE DATA
 0BB5 C1E3          0BB6  191        DC    XL2'C1E3'
 0BB7 C0 87 0B42          192        B     WTIDS
                          193 *
                          194 *      SETUP THE COMMANDS FOR THE DRIVE SELECTED
                          195 *
 0BBB 0C 00 0BC5 146B     196 DOPACK MVC   DRID(1),DRIVE#     MOVE IN DRIVE WANTED
 0BC1 C0 87 1B5B          197        B     SELDSK             THIS SUBROUTINE SETS THE COMMANDS
 0BC5 00                  198 DRID   DC    XL1'00'
 0BC6 C0 87 0BCA          199        B     *+4
                          200
 0BCA 0C 01 157A 1F95     201        MVC   HDRFA0+12(2),ZERO  CLEAR HEADER BUFFERS
 0BD0 0C 01 15DA 1F95     202        MVC   HDRFA6+12(2),ZERO
 0BD6 0C 01 163A 1F95     203        MVC   HDRFA7+12(2),ZERO
 0BDC 3C 40 2691          204        MVI   DISP4+279,X'40'    CLEAR DISPLAY 4 OUTPUT FIELD
 0BE0 0C 77 2690 2691     205        MVC   DISP4+278(120),DISP4+279
                          206 *
                          207 *      HANDLE HEADER CARDS HERE
                          208 *
 0BE6 38 80 0233          209        TBN   UTAE+1,X'80'       RUNNING FROM DISK?
 0BEA C0 90 0D65          210        BF    SKMSG              IF NOT, SKIP FOLLOWING DISPLAYS
                          211 *                               AND UPDATING OF R47
 0BEE C2 01 169B          212        LA    SVUPDT-5,XR1
 0BF2 4D 01 01 16A6       213 CKAGN  CLC   1(2,XR1),FA0       IS IT FA0?
 0BF7 F2 81 53            214        JE    HDFA0
 0BFA 4D 01 01 16AE       215        CLC   1(2,XR1),FA6       IS   IT FA6?
 0BFF F2 81 5B            216        JE    HDFA6
 0C02 C2 02 0232          217 HDFA7  LA    UTAE,XR2           IT IS FA7
 0C06 C0 87 022A          218        B     LOAD               NO--GET HEADER FROM PROGRAM AREA
 0C0A 20            0C0A  219        DC    XL1'20'
 0C0B DFA7          0C0C  220        DC    XL2'DFA7'
 0C0D 0C 5F 168D 08DF     221        MVC   HDRFA7+95(96),INREC+95
 0C13 F2 87 54            222        J     CKNXT
                          223
 0C16 2C 06 1642 14       224        MVC   HDRFA7+20(7),20(,XR2)  SAVE PN
 0C1B 2C 06 164D 1F       225        MVC   HDRFA7+31(7),31(,XR2)  SAVE EC
 0C20 2C 02 1688 07       226        MVC   HDRFA7+90(3),7(,XR2)   SAVE ID
 0C25 2C 00 1689 09       227        MVC   HDRFA7+91(1),9(,XR2)   SAVE LEVEL
 0C2A 0C 02 163B 1A8C     228        MVC   HDRFA7+13(3),PN      PUT PN IN FIELD
 0C30 0C 02 1646 1A8F     229        MVC   HDRFA7+24(3),EC      PUT EC IN FIELD
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FC21 3340 IPL FORMAT PROGRAM --MODEL 12

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0C36 F2 87 31              230         J     CKNXT                    GO CHECK FOR NEXT ONE
                              231
   0C39 C0 87 021A            232 NCTFND  B     PRINT                    INDICATE FA7 NOT ON PACK
   0C3D C6              0C3D  233         DC    XL1'C6'
   0C3E 37              0C3E  234         DC    XL1'55'
   0C3F 1902            0C40  235         DC    AL2(MSGFA7)
   0C41 C101            0C42  236         DC    XL2'C101'
   0C43 C0 87 0222            237         B     HALT
   0C47 C101            0C48  238         DC    XL2'C101'
   0C49 C0 87 0C43            239         B     *-6
                              240
   0C4D C0 87 022A            241 HDFA0   B     LOAD
   0C51 20              0C51  242         DC    XL1'20'
   0C52 DFA0            0C53  243         DC    XL2'DFA0'
   0C54 0C 5F 15CD 08DF       244         MVC   HDRFA0+95(96),INREC+95   SAVE FA0 HEADER CARD
   0C5A F2 87 0D              245         J     CKNXT
                              246
   0C5D C0 87 022A            247 HDFA6   B     LOAD
   0C61 20              0C61  248         DC    XL1'20'
   0C62 DFA6            0C63  249         DC    XL2'DFA6'
   0C64 0C 5F 162D 08DF       250         MVC   HDRFA6+95(96),INREC+95   SAVE FA6 HEADER CARD
   0C6A D2 01 02              251 CKNXT   LA    2(,XR1),XR1
   0C6D 7D FF 00              252         CLI   0(,XR1),X'FF'            END OF LIST?
   0C70 F2 81 0A              253         JE    CNTUE
   0C73 7D 40 00              254         CLI   0(,XR1),C' '             ANY MORE?
   0C76 F2 81 04              255         JE    CNTUE
   0C79 C0 87 0BF2            256         B     CKAGN
                              257 *
                              258 *       ALL NEW ECS AND PNS ARE OBTAINED
                              259 *       NOW GO SETUP FOR THE DISPLAY
                              260 *
                        0C7D  261 CNTUE   EQU   *
                              262 *
                              263 *       NOW CYL 0, TRACK 0, RECORD 47 MUST BE UPDATED
                              264 *
   0C7D 3C 2F 1454            265         MVI   R,47                     SETUP TO READ R47
   0C81 3C 00 1458            266         MVI   N,0
   0C85 C0 87 1BF7            267         B     STRTIO                   ISSUE THE SEEK
   0C89 00              0C89  268         DC    XL1'00'
   0C8A 00              0C8A  269         DC    XL1'00'
   0C8B 144F            0C8C  270         DC    AL2(DDCF)
   0C8D C0 87 1A96            271         B     SKBUSY                   CHECK SEEK BUSY
   0C91 C0 87 1C59            272         B     DEVERR                   ANY ERRORS
   0C95 C0 87 0C99            273         B     *+4
                              274
   0C99 0C 01 1DCA 168F       275         MVC   DFDR(2),ABFR47           SETUP DATA REGISTER
   0C9F C0 87 1BF7            276         B     STRTIO                   ISSUE READ KEY-DATA
   0CA3 01              0CA3  277         DC    XL1'01'
   0CA4 00              0CA4  278         DC    XL1'00'
   0CA5 144F            0CA6  279         DC    AL2(DDCF)
   0CA7 C0 87 1AE6            280         B     ATTBSY                   GO CHECK ATTACHMENT BUSY
   0CAB C0 87 1C59            281         B     DEVERR                   CHECK FOR ANY ERRORS
   0CAF C0 87 0CB3            282         B     *+4
                              283
   0CB3 3C 03 144C            284         MVI   COUNT,3
   0CB7 C2 01 261B            285         LA    DISP4+161,XR1            THIS POINTS TO DISPLAY 4
   0CBB 34 01 1691            286         ST    SDISP4,XR1
   0CBF C2 01 156E            287         LA    HDRFA0,XR1               THIS POINTS TO HDR BUFFERS
   0CC3 C2 02 146E            288         LA    BUFR47,XR2               THIS POINTS TO R47 BUFFER
                              289
   0CC7 7D 00 0C              290 CK00    CLI   12(,XR1),X'00'           WAS THIS PROGRAM UPDATED?
   0CCA F2 81 40              291         JE    SKMVC
   0CCD 9C 03 03 5B           292         MVC   3(4,XR2),91(,XR1)        YES--FIRST SAVE ID AND LEVEL
   0CD1 BC 00 04              293         MVI   4(,XR2),X'00'            PUT IN X'00' DELIMETER
   0CD4 2C 06 169A 1E         294         MVC   OLDEC(7),30(,XR2)        SAVE OLD EC
   0CD9 9C 09 0E 14           295         MVC   14(10,XR2),20(,XR1)      SAVE PN
   0CDD BC 05 14 1F95         296         MVC   20(6,XR2),ZERO           ZERO PART OF BUFFER
   0CE2 9C 09 1E 1F           297         MVC   30(10,XR2),31(,XR1)      SAVE EC
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0CE6 BC 00 4F              298         MVI   79(,XR2),X'00'           ZERO REST OF FIELD
   0CE9 AC 2F 4E 4F           299         MVC   78(48,XR2),79(,XR2)
                              300 *
                              301 *       NOW UPDATE MESSAGE TO BE DISPLAYED ON IDS THAT WERE UPDATED
                              302 *
   0CED 34 01 1693            303         ST    SAV1,XR1
   0CF1 35 01 1691            304         L     SDISP4,XR1               THIS WILL POINT TO CURRECT LOC
                              305 *                                      IN THE DISPLAY FIELD
   0CF5 6C 02 02 02           306         MVC   2(3,XR1),2(,XR2)         SAVE ID
   0CF9 4C 06 0C 169A         307         MVC   12(7,XR1),OLDEC          PUT IN OLD EC
   0CFE 6C 06 15 1E           308         MVC   21(7,XR1),30(,XR2)       PUT IN NEW EC
   0D02 D2 01 28              309         LA    40(,XR1),XR1             UPDATE FOR NEXT ENTRY
   0D05 34 01 1691            310         ST    SDISP4,XR1
   0D09 35 01 1693            311         L     SAV1,XR1
                              312
   0D0D D2 01 60              313 SKMVC   LA    96(,XR1),XR1
   0D10 E2 02 50              314         LA    80(,XR2),XR2
   0D13 0F 00 144C 1BED       315         SLC   COUNT(1),ONE             DONE?
   0D19 C0 01 0CC7            316         BNZ   CK00
   0D1D 3C 00 156D            317         MVI   BUFR47+255,0             CLEAR OUT REST OF FIELD
   0D21 0C 0E 156C 156D       318         MVC   BUFR47+254(15),BUFR47+255
                              319 *
                              320 *       NOW DISPLAY MESSAGE OF IDS TO BE UPDATED
                              321 *
   0D27 C0 87 021A            322         B     PRINT                    DISPLAY MESSAGE
   0D2B 01              0D2B  323         DC    XL1'01'                  FLAG
   0D2C 50              0D2C  324         DC    AL1(DISP4A-DISP4)        LENGTH
   0D2D 25CA            0D2E  325         DC    AL2(DISP4A)
   0D2F C0 87 021A            326         B     PRINT                    DISPLAY MESSAGE
   0D33 02              0D33  327         DC    XL1'02'                  FLAG
   0D34 28              0D34  328         DC    AL1(DISP4B-DISP41)       LENGTH
   0D35 25F2            0D36  329         DC    AL2(DISP4B)
   0D37 C0 87 021A            330         B     PRINT                    DISPLAY MESSAGE
   0D3B 01              0D3B  331         DC    XL1'01'                  FLAG
   0D3C 28              0D3C  332         DC    AL1(DISP4C-DISP42)       LENGTH
   0D3D 261A            0D3E  333         DC    AL2(DISP4C)
   0D3F C0 87 021A            334         B     PRINT                    DISPLAY MESSAGE
   0D43 01              0D43  335         DC    XL1'01'                  FLAG
   0D44 28              0D44  336         DC    AL1(DISP4D-DISP43)       LENGTH
   0D45 2642            0D46  337         DC    AL2(DISP4D)
   0D47 C0 87 021A            338         B     PRINT                    DISPLAY MESSAGE
   0D4B 01              0D4B  339         DC    XL1'01'                  FLAG
   0D4C 28              0D4C  340         DC    AL1(DISP4E-DISP44)       LENGTH
   0D4D 266A            0D4E  341         DC    AL2(DISP4E)
   0D4F C0 87 021A            342         B     PRINT                    DISPLAY MESSAGE
   0D53 06              0D53  343         DC    XL1'06'                  FLAG
   0D54 28              0D54  344         DC    AL1(DISP4F-DISP45)       LENGTH
   0D55 2692            0D56  345         DC    AL2(DISP4F)
   0D57 C0 87 0222            346         B     HALT                     GIVE TIME TO VERIFY EC'S #
   0D5B C2E4            0D5C  347         DC    XL2'C2E4'
   0D5D C0 87 021A            348         B     PRINT                    DISPLAY UPDATE IN PROCESS
   0D61 06              0D61  349         DC    XL1'06'
   0D62 28              0D62  350         DC    XL1'40'
   0D63 1940            0D64  351         DC    AL2(UPDATE)
                              352
   0D65 C2 01 169E            353 SKMSG   LA    SVUPDT-5,XR1             THIS POINTS TO THE CURRENT ID
   0D69 34 01 144E            354         ST    SAVPTR,XR1                BEING OPERATED ON
                              355
   0D6D 38 80 0233            356         TBN   UTAB+1,X'80'             RUNNING FROM DISK?
   0D71 F2 10 30              357         JT    CKFA0                    IS SO, CONTINUE ON
   0D74 4D 01 01 16A6         358         CLC   1(2,XR1),FA0             IF NOT, PRINT MESSAGE INDICATING
   0D79 F2 81 28              359         JE    CKFA0                     THAT IF 3340 MICRO NOT LOADED,
   0D7C C0 87 021A            360         B     PRINT                      FA0 MUST BE UPDATED FIRST BECAUSE
   0D80 41              0D80  361         DC    XL1'41'                     IT WILL FIRST LOAD CONTROL STORE
   0D81 28              0D81  362         DC    IL1'40'
   0D82 1A0E            0D83  363         DC    AL2(MGNOTE)
   0D84 C1F4            0D85  364         DC    XL2'C1F4'
   0D86 C0 87 021A            365         B     PRINT
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0D8A 01               0D8A  366        DC    XL1'01'
   0D8B 5B               0D8B  367        DC    IL1'91'
   0D8C 1A6S             0D8D  368        DC    AL2(MG1)
   0D8E C0 87 021A             369        B     PRINT
   0D92 06               0D92  370        DC    XL1'06'
   0D93 20               0D93  371        DC    IL1'32'
   0D94 1A89             0D95  372        DC    AL2(MG2)
   0D96 C0 87 0222             373        B     HALT
   0D9A C1F4             0D9B  374        DC    XL2'C1F4'
                               375
                               376 *
                               377 *      IF PROGRAM CONTINUES, SVP REQ LATCH MUST BE SET
                               378 *
   0D9C 31 C5 1BF4             379        LIO   XREG,X'C5'          THIS ALLOWS 12 MBYTE TO BE USED
   0DA0 31 C5 1BF6             380        LIO   SVPREQ,X'C5'
                               381
   0DA4 4D 01 01 16A6          382 CKFA0  CLC   1(2,XR1),FA0        IS IT FA0?
   0DA9 C0 81 0E98             383        BE    DOFA0
   0DAD C0 87 1BF7             384        B     STRTIO              NO--SETUP FOR FA6 OR FA7
   0DB1 00               0DB1  385        DC    XL1'00'             RECALIBRATE
   0DB2 01               0DB2  386        DC    XL1'01'
   0DB3 144F             0DB4  387        DC    AL2(DDCF)
   0DB5 C0 87 1A96             388        B     SKBUSY              CHECK SEEK BUSY
   0DB9 C0 87 1C59             389        B     DEVERR              CHECK FOR ERRORS
   0DBD C0 87 0DC1             390        B     *+4
                               391
   0DC1 3C 19 1454             392        MVI   R,25                SETUP TO READ RECORDS 25-29
   0DC5 3C 04 1458             393        MVI   N,4
   0DC9 0C 01 1DCA 1F8D        394        MVC   DFDR(2),ABUF
   0DCF C0 87 1BF7             395        B     STRTIO              READ
   0DD3 01               0DD3  396        DC    XL1'01'             KEY-DATA
   0DD4 00               0DD4  397        DC    XL1'00'
   0DD5 144F             0DD6  398        DC    AL2(DDCF)
   0DD7 C0 87 1AE6             399        B     ATTBSY              CHECK ATTACHMENT BUSY
   0DDB C0 87 1C59             400        B     DEVERR              ANY ERRORS
   0DDF C0 87 0DE3             401        B     *+4
                               402
   0DE3 35 01 144E             403        L     SAVPTR,XR1
   0DE7 4D 01 01 16A8          404        CLC   1(2,XR1),FA6        IS IT FA6?
   0DEC C0 81 0E26             405        BE    DOFA6
                               406
   0DF0 38 80 0233             407        TBN   UTAB+1,X'80'        RUNNING FROM DISK
   0DF4 F2 10 10               408        JT    LFA7
   0DF7 C0 87 021A             409        B     PRINT               INDICATE FA7 WILL NOW BE LOADED
   0DFB 46               0DFB  410        DC    XL1'46'
   0DFC 27               0DFC  411        DC    IL1'39'
   0DFD 1967             0DFE  412        DC    AL2(MGFA7)
   0DFF C1F3             0E00  413        DC    XL2'C1F3'
   0E01 C0 87 0222             414        B     HALT
   0E05 C1F3             0E06  415        DC    XL2'C1F3'
                               416
   0E07 C0 87 022A             417 LFA7   B     LOAD                NO--SO LOAD FA7
   0E0B 20               0E0B  418        DC    XL1'20'
   0E0C DFA7             0E0D  419        DC    XL2'DFA7'
   0E0E 38 80 0233             420        TBN   UTAB+1,X'80'        RUNNING FROM DISK
   0E12 F2 10 06               421        JT    *+9                 IF SO, SKIP NEXT INSTRUCTION
   0E15 0C 5F 168D 08DF        422        MVC   HDRFA7+95(96),INREC+95  SAVE HEADER CARD INFO
   0E1B C0 87 022A             423        B     LOAD                LOAD REST OF FA7
   0E1F 04               0E1F  424        DC    XL1'04'
   0E20 DFA7             0E21  425        DC    XL2'DFA7'
   0E22 C0 87 0EEC             426        B     WFA67               GO WRITE FA6 AND FA7
                               427
                         0E26  428 DOFA6  EQU   *
   0E26 38 80 0233             429        TBN   UTAE+1,X'80'        RUNNING FROM DISK
   0E2A F2 10 10               430        JT    LFA6
   0E2D C0 87 021A             431        B     PRINT               INDICATE FA6 WILL NOW BE LOADED
   0E31 46               0E31  432        DC    XL1'46'
   0E32 27               0E32  433        DC    IL1'39'
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0E33 198E             0E34  434        DC    AL2(MSGFA6)
   0E35 C1F2             0E36  435        DC    XL2'C1F2'
   0E37 C0 87 0222             436        B     HALT
   0E3B C1F2             0E3C  437        DC    XL2'C1F2'
                               438
   0E3D C0 87 022A             439 LFA6   B     LOAD                HANDLE FA6 HERE
   0E41 20               0E41  440        DC    XL1'20'             (MINI MICRO)
   0E42 DFA6             0E43  441        DC    XL2'DFA6'
   0E44 0C 07 143C 08DF        442        MVC   IDSEQ(8),INREC+95       SAVE HEADER ID & SEQ
   0E4A 38 80 0233             443        TBN   UTAB+1,X'80'        RUNNING FROM DISK
   0E4E F2 10 06               444        JT    FORM01              IF SO, SKIP NEXT INSTRUCTION
   0E51 0C 5F 162D 08DF        445        MVC   HDRFA6+95(96),INREC+95  SAVE HEADER CARD
   0E57 06 03 143C 1440        446 FORM01 AZ    IDSEQ(4),DEC1             ADD 1 TO SEQ
   0E5D C0 87 022A             447        B     LOAD                LOAD NEXT RECORD
   0E61 10               0E61  448        DC    XL1'10'
   0E62 0D 07 08CF 143C        449        CLC   INREC+79(8),IDSEQ   CHECK FOR NON-COMPRESSED CARD
   0E68 C0 01 1392             450        BNE   CMPRES              COMPRESS CARD IF NOT COMPRESSED
   0E6C 3D C5 0881             451        CLI   INREC+1,C'E'        CHECK FOR 'END' CARD
   0E70 C0 81 0EEC             452        BE    WFA67               GO WRITE DATA BACK
   0E74 C2 02 088A             453        LA    INREC+10,XR2        XR2 POINTS TO INPUT DATA BYTES
   0E78 C2 01 3294             454        LA    BUFFA6,XR1          XR1 POINTS TO BUFFER
   0E7C C0 87 13FE             455        B     COMPUT              COMPUTE FINAL VALUE OF POINTER
   0E80 0F 01 0886 1446        456 FORM02 SLC   INREC+6(2),I3       DECREMENT BYTE COUNT
   0E86 C0 82 0E57             457        BL    FORM01              GO IF COUNT IS NEGATIVE
   0E8A 6C 02 02 02            458        MVC   2(3,XR1),2(,XR2)    MOVE 3 BYTES
   0E8E D2 01 03               459        LA    3(,XR1),XR1         INCREMENT
   0E91 E2 02 03               460        LA    3(,XR2),XR2         COUNTERS
   0E94 C0 87 0E80             461        B     FORM02
                               462
                         0E98  463 DOFA0  EQU   *                  HANDLE FA0 HERE
   0E98 38 80 0233             464        TBN   UTAE+1,X'80'        RUNNING FROM DISK
   0E9C F2 10 18               465        JT    LFA0
                               466
   0E9F C0 87 021A             467        B     PRINT               INDICATE FA0 WILL NOW BE LOADED
   0EA3 41               0EA3  468        DC    XL1'41'
   0EA4 32               0EA4  469        DC    IL1'50'
   0EA5 19C0             0EA6  470        DC    AL2(MSGFA0)
   0EA7 C1F1             0EA8  471        DC    XL2'C1F1'
   0EA9 C0 87 021A             472        B     PRINT
   0EAD 06               0EAD  473        DC    XL1'06'
   0EAE 26               0EAE  474        DC    IL1'38'
   0EAF 19E6             0EB0  475        DC    AL2(MSGC17)
   0EB1 C0 87 0222             476        B     HALT
   0EB5 C1F1             0EB6  477        DC    XL2'C1F1'
                               478
   0EB7 0C 18 0A39 0A18        479 LFA0   MVC   SVPFC(25),COM-1       SAVE SECTION PREFACE
   0EBD C0 87 022A             480        B     LOAD
   0EC1 04               0EC1  481        DC    XL1'04'
   0EC2 DC17             0EC3  482        DC    XL2'DC17'
   0EC4 39 80 0233             483        TBF   UTAB+1,X'80'        RUNNING FROM CARD
   0EC8 F2 10 04               484        JT    *+7
   0ECB 3A 10 0A19             485        SBN   CCM,X'10'           SET FLAG WHEN RUNNING FROM DISK
                               486 *                                FLAG BYPASSES LOADING CONTROL STORE
   0ECF C0 87 6C02             487        B     X'6C02'
   0ED3 38 80 0233             488        TBN   UTAB+1,X'80'        RUNNING FROM DISK?
   0ED7 F2 10 0E               489        JT    GWRITE
   0EDA 0C 5F 15CD 755F        490        MVC   HDRFA0+95(96),X'755F'  PICK UP HEADER THAT C17 LEFT
                               491 *                                  IN MEMORY AT X'755F'
   0EE0 31 C5 1BF4             492        LIC   XREG,X'C5'          SET SVP REQ LATCH
   0EE4 31 C5 1BF6             493        LIO   SVPREQ,X'C5'          SO THAT 12 MBYTE MAY BE USED
   0EE8 C0 87 11E4             494 GWRITE B     WRFA0               GO WRITE DATA BACK
                               495 *
                               496 *      WRITE FA6 AND FA7 BACK ON TRACK 0 HERE
                               497 *
                         0EEC  498 WFA67  EQU   *
   0EEC 35 01 144E             499        L     SAVPTR,XR1
   0EF0 4D 01 01 16AA          500        CLC   1(2,XR1),FA7        IS IT FA7
   0EF5 C0 01 117C             501        BNE   WFA6                NO-
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                                 502 *
                                 503 *       DETERMINE IF 12 OR 70 MBYTE PACK
                                 504 *
   0EF9 0C 01 1DCA 1D3E          505         MVC   DFDR(2),ADIAG
   0EFF C0 87 1BF7               506         B     STRTIO                 DO DIAG READ
   0F03 01               0F03    507         DC    XL1'01'
   0F04 07               0F04    508         DC    XL1'07'
   0F05 1DD7             0F06    509         DC    AL2(RDFCF)
   0F07 C0 87 1AE6               510         B     ATTBSY                 CHECK ATTACHMENT BUSY
   0F0B C0 87 0F0F               511         B     *+4
                                 512
   0F0F 3C 00 16C3               513         MVI   CARSAV,X'00'           SETUP AS IF 70 MBYTE
   0F13 3C 04 16C2               514         MVI   HARSAV,X'04'
   0F17 39 03 1D27               515         TBF   DIAG+2,X'03'           12 MBYTE?
   0F1B F2 90 08                 516         JF    SKCYL0
   0F1E 3C 01 16C3               517         MVI   CARSAV,X'01'           SETUP FOR 12 MBYTE
   0F22 3C 00 16C2               518         MVI   HARSAV,X'00'
                                 519 *
                                 520 *       MUST NOW DETERMINE IF CYL0 TRACK 2 HAS AN ALTERNATE
                                 521 *
   0F26 0C 01 1DCA 17C5          522 SKCYL0  MVC   DFDR(2),ALTADR           COME HERE TO HANDLE FA7
   0F2C C0 87 1BF7               523         B     STRTIO                 SEEK TO CYL 0, TRACK 2
   0F30 00               0F30    524         DC    XL1'00'
   0F31 00               0F31    525         DC    XL1'00'
   0F32 1DCD             0F33    526         DC    AL2(WDFCF)
   0F34 C0 87 1A96               527         B     SKBUSY                 CHECK SEEK BUSY
   0F38 C0 87 1C59               528         B     DEVERR                 ANY ERRORS?
   0F3C C0 87 0F40               529         B     *+4
                                 530
   0F40 C0 87 1BF7               531         B     STRTIO                 NOW READ HA-R0
   0F44 01               0F44    532         DC    XL1'01'
   0F45 01               0F45    533         DC    XL1'01'
   0F46 1DD7             0F47    534         DC    AL2(RDFCF)
   0F48 C0 87 1AE6               535         B     ATTBSY
   0F4C C0 87 1C59               536         B     DEVERR
   0F50 C0 87 0F54               537         B     *+4
   0F54 39 02 1DD7               538         TBF   RDFCF,X'02'            DEFECTIVE?
   0F58 C0 10 115B               539         BT    NOTDEF                 NO
                                 540 *
                                 541 *       CALCULATE 3340 PHYSICAL ADDRESS HERE
                                 542 *
   0F5C C0 87 0F78               543         B     NXTONE
   0F60 0C 01 16CE 1F95          544         MVC   OUTREC+4(2),ZERO       *
   0F66 0C 01 16C6 1F95          545         MVC   OUTREC+2(2),ZERO       *
   0F6C C2 01 17E3               546 DCLCCP  LA    MSG3+7,XR1             * OMIT AFTER TESTING
   0F70 C2 02 185B               547         LA    MSG4+7,XR2             *
   0F74 3C 0A 17D6               548         MVI   PCOUNT,10              *
                                 549 *
                                 550 *       FIRST CALCULATE 3340 LOGICAL FROM SYS/3 LOGICAL
                                 551 *
   0F78 39 03 1D27               552 NXTONE  TBF   DIAG+2,X'03'           12 MBYTE?
   0F7C C0 10 103E               553         BT    CAL12                  IF SO, GO DO THOSE CALCULATIONS
   0F80 0C 01 17D3 1F95          554         MVC   WORK(2),ZERO
   0F86 0C 01 17C7 16C6          555         MVC   CL3(2),OUTREC+2        GET SYS/3 LOGICAL CYL
   0F8C 0C 01 17C9 16C8          556         MVC   HL3(2),OUTREC+4        GET SYS/3 LOGICAL HEAD
   0F92 3C 28 144C               557         MVI   CCUNT,40
   0F96 0E 01 17D3 17C7          558 MULT40  ALC   WORK(2),CL3            MULTIPLY CL3 BY 40
   0F9C 0F 00 144C 1BED          559         SLC   CCUNT(1),ONE
   0FA2 C0 01 0F96               560         BNZ   MULT40
                                 561
   0FA6 0E 01 17D3 17C9          562         ALC   WORK(2),HL3            NOW ADD 2(HL3) TO CL3
   0FAC 0E 01 17D3 17C9          563         ALC   WORK(2),HL3
                                 564 *
                                 565 *       DIVIDE ABOVE BY 12
                                 566 *
   0FB2 0C 01 144C 1F95          567         MVC   CCUNT(2),ZERO
   0FB8 0D 01 17D3 17D5          568         CLC   WORK(2),TWELVE         IF LESS THAN 12, DON'T DIVIDE
   0FBE F2 02 03                 569         JNL   DIV12
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   0FC1 F2 87 16                 570         J     SKD12
   0FC4 0F 01 17D3 17D5          571 DIV12   SLC   WORK(2),TWELVE
   0FCA 0E 01 144C 1BED          572         ALC   CCUNT(2),ONE
   0FD0 0D 01 17D3 17D5          573         CLC   WORK(2),TWELVE
   0FD6 C0 02 0FC4               574         BNL   DIV12
   0FDA 0C 01 17CB 144C          575 SKD12   MVC   CLW(2),COUNT           INTEGER PART IS 3340 LOGICAL CYL
   0FE0 0C 01 17CD 17D3          576         MVC   HLW(2),WORK            REMAINDER IS 3340 LOGICAL HEAD
                                 577 *
                                 578 *       NOW CALCULATE 3340 PHYSICAL FROM 3340 LOGICAL
                                 579 *
                                 580 *       FIRST, DIVIDE CLW BY 2
   0FE6 0C 01 144C 1F95          581         MVC   CCUNT(2),ZERO
   0FEC 0C 01 17D3 17CB          582         MVC   WORK(2),CLW
   0FF2 0D 01 17D3 1BEF          583         CLC   WORK(2),TWO            IF LESS THAN 2 DON'T DIVIDE
   0FF8 F2 02 03                 584         JNL   DIV02
   0FFB F2 87 16                 585         J     SKD02
   0FFE 0F 01 17D3 1BEF          586 DIV02   SLC   WORK(2),TWO
   1004 0E 01 144C 1BED          587         ALC   COUNT(2),ONE
   100A 0D 01 17D3 1BEF          588         CLC   WORK(2),TWO
   1010 C0 02 0FFE               589         BNL   DIV02
                                 590
   1014 0C 01 17CF 144C          591 SKD02   MVC   CPW(2),COUNT           3340 PHYSICAL CYL IS INTEGER
                                 592 *                                    PART OF ABOVE CALCULATION
                                 593 *
                                 594 *       REMAINDER OF ABOVE CALCULATION IS NOW MULTIPLIED BY 12
                                 595 *
   101A 3C 0C 144C               596         MVI   COUNT,12
   101E 0C 01 17D1 1F95          597         MVC   HPW(2),ZERO
   1024 0E 01 17D1 17D3          598 MULT12  ALC   HPW(2),WORK
   102A 0F 00 144C 1BED          599         SLC   COUNT(1),ONE
   1030 C0 01 1024               600         BNZ   MULT12
                                 601 *
                                 602 *       ADD HLW TO ABOVE TO GET 3340 PHYSICAL HEAD VALUE
                                 603 *
   1034 0E 01 17D1 17CD          604         ALC   HPW(2),HLW
   103A C0 87 10A7               605         B     OBYTE                  GO WRITE FA7 BACK ON DISK
                                 606 *
                                 607 *
                                 608 *       FOLLOWING IS USED TO CALCULATE PHYSICAL HEAD AND CYL
                                 609 *       FOR 12 MBYTE CE DATA MODULES
                                 610 *
                                 611 *
                          103E   612 CAL12   EQU   *
   103E 0C 01 17D3 1F95          613         MVC   WORK(2),ZERO
   1044 0C 01 17C7 16C6          614         MVC   CL3(2),OUTREC+2        GET SYS/3 LOGICAL CYL
   104A 0C 01 17C9 16C8          615         MVC   HL3(2),OUTREC+4        GET SYS/3 LOGICAL HEAD
   1050 3C 0A 144C               616         MVI   COUNT,10
   1054 0E 01 17D3 17C7          617 MULT10  ALC   WORK(2),CL3            MULTIPLY BY 10
   105A 0F 00 144C 1BED          618         SLC   COUNT(1),ONE
   1060 C0 01 1054               619         BNZ   MULT10
                                 620 *
                                 621 *       DIVIDE SYS/3 LOGICAL HEAD VALUE BY 2
                                 622 *
   1064 0C 01 144C 1F95          623         MVC   COUNT(2),ZERO
   106A 0D 01 17C9 1BEF          624         CLC   HL3(2),TWO
   1070 F2 02 03                 625         JNL   DV02
   1073 F2 87 16                 626         J     SKDV02
   1076 0F 01 17C9 1BEF          627 DV02    SLC   HL3(2),TWO
   107C 0E 01 144C 1BED          628         ALC   COUNT(2),ONE
   1082 0D 01 17C9 1BEF          629         CLC   HL3(2),TWO
   1088 C0 02 1076               630         BNL   DV02
   108C 0E 01 17D3 144C          631 SKDV02  ALC   WORK(2),COUNT          ADD QUOTIENT TO CL3*10
   1092 0C 01 17CF 17D3          632         MVC   CPW(2),WORK            SAVE 3340 PHYSICAL CYLINDER
                                 633 *
                                 634 *       IF REMAINCER OF ABOVE DIVISION IS 0, HPW = 0;
                                 635 *       IF REMAINDER IS 1, HPW = 2
                                 636 *
   1098 3C 00 17D1               637         MVI   HPW,0
```

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   109C 3D 00 17C9            638         CLI   HL3,X'00'          REMAINDER 07
   10A0 F2 81 04              639         JE    *+7
   10A3 3C 02 17D1            640         MVI   HPW,2
                              641 *
                              642 *       HOW CYLINDER VALUE MUST BE CONVERTED TO ONE BYTE FORMAT
                              643 *       FORMAT IS AS FOLLOWS:
                              644 *
                              645 *       CARSAV---CONTAINS CYLINDERS 00-FF
                              646 *       HARSAV--BITS  0   1   2   3   4   5   6   7
                              647 *                     0   1   0   |<-HEAD VALUES->|
                              648 *
                              649 *                     BITS 0 AND 2 ARE ALWAYS 0
                              650 *                     BIT 1 IS 1 ONLY WHEN CYL IS GREATER THAN X'FF'
                              651 *
                              652 *
   10A7 0C 00 16C3 17CF       653 OBYTE   MVC   CARSAV(1),CPW
   10AD 3B 40 16C2            654         SBF   HARSAV,X'40'
   10B1 0D 01 17CF 17D8       655         CLC   CPW(2),CKER         IS CYL GREATER THAN X'00FF'
   10B7 F2 84 03              656         JH    HERE
   10BA F2 87 04              657         J     *+7
   10BD 3A 40 16C2            658 HERE    SBN   HARSAV,X'40'        IF SO, SET BIT 1 ON
                              659
   10C1 08 03 16C2 17D1       660         MNR   HARSAV,HPW
   10C7 3B 10 16C2            661         SBF   HARSAV,X'10'
   10CB 3D 0F 17D1            662         CLI   HPW,X'0F'           IS 3340 HD GREATER THAN 'OF' ?
   10CF F2 84 03              663         JH    HERE1
   10D2 F2 87 04              664         J     *+7
   10D5 3A 10 16C2            665 HERE1   SBN   HARSAV,X'10'        IF SO, SET BIT 3 ON
                              666
                              667 *
                              668 *       FOLLOWING IS FOR DEBUG ONLY--WILL PRINT OUT ALL VALUES
                              669 *       CALCULATED BY ABOVE SUBROUTINE
                              670 *
   10D9 C0 87 115B            671         B     NOTDEF
   10DD 34 02 10ED            672         ST    UNP1,XR2
   10E1 34 01 10F6            673         ST    UNP2,XR1
   10E5 C0 87 021E            674         B     UNPACK
   10E9 01          10E9      675         DC    XL1'01'
   10EA 16C3        10EB      676         DC    AL2(CARSAV)
   10EC 0000        10ED      677 UNP1    DC    AL2(*-*)
   10EE C0 87 021E            678         B     UNPACK
   10F2 02          10F2      679         DC    XL1'02'
   10F3 16C6        10F4      680         DC    AL2(OUTREC+2)
   10F5 0000        10F6      681 UNP2    DC    AL2(*-*)
   10F7 7C 60 01              682         MVI   1(,XR1),C'-'
   10FA BC 60 01              683         MVI   1(,XR2),C'-'
                              684
   10FD D2 01 05              685         LA    5(,XR1),XR1
   1100 E2 02 05              686         LA    5(,XR2),XR2
   1103 34 02 1113            687         ST    UNP3,XR2
   1107 34 01 111C            688         ST    UNP4,XR1
   110B C0 87 021E            689         B     UNPACK
   110F 01          110F      690         DC    XL1'01'
   1110 16C2        1111      691         DC    AL2(HARSAV)
   1112 0000        1113      692 UNP3    DC    AL2(*-*)
   1114 C0 87 021E            693         B     UNPACK
   1118 02          1118      694         DC    XL1'02'
   1119 16C8        111A      695         DC    AL2(OUTREC+4)
   111B 0000        111C      696 UNP4    DC    AL2(*-*)
                              697
   111D 3D 13 16CC            698         CLI   OUTREC+4,19
   1121 F2 81 09              699         JE    ICYL
   1124 0E 00 16C8 1BED       700         ALC   OUTREC+4(1),ONE
   112A F2 87 0A              701         J     CKPRT
   112D 3C 00 16C8            702 ICYL    MVI   OUTREC+4,0
   1131 0E 00 16C6 1BED       703         ALC   OUTREC+2(1),ONE
   1137 D2 01 05              704 CKPRT   LA    5(,XR1),XR1
   113A E2 02 05              705         LA    5(,XR2),XR2
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FC21 3340 IPL FORMAT PROGRAM --MODEL 12

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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT
   113D 0F 00 17D6 18ED       706         SLC   PCOUNT(1),ONE
   1143 C0 01 0F78            707         BNZ   NXTONE
   1147 C0 87 021A            708         B     PRINT
   114B 01          114B      709         DC    XL1'01'
   114C 78          114C      710         DC    IL1'120'
   114D 1850        114E      711         DC    AL2(MSG3P)
   114F C0 87 021A            712         B     PRINT
   1153 02          1153      713         DC    XL1'02'
   1154 78          1154      714         DC    IL1'120'
   1155 18C8        1156      715         DC    AL2(MSGWP)
   1157 C0 87 0F6C            716         B     DOLOOP
                              717
                              717
   115B                       718 NOTDEF  EQU   *                 SETUP FA7 BUFFER
   115B 0C FF 28FF 30FF       719         MVC   BUFFER+255(256),BUFFA7+255
   1161 0C FF 29FF 31FF       720         MVC   BUFFER+511(256),BUFFA7+511
   1167 0C 93 2A93 3293       721         MVC   X'2A93'(148),ENDFA7
   116D 0C 00 2A20 16C3       722         MVC   CARREQ(1),CARSAV    PUT IN CORRECT PHYSICAL 3340 CYL
   1173 0C 00 2A22 16C2       723         MVC   HARREQ(1),HARSAV    PUT IN CORRECT PHYSICAL 3340 HEAD
   1179 F2 87 12              724         J     DOWRT
                              725
   117C                       726 WFA6    EQU   *                 SETUP FA6 BUFFER
   117C 0C FF 2B93 3393       727         MVC   BUFER6+255(256),BUFFA6+255
   1182 0C FF 2C93 3493       728         MVC   BUFER6+511(256),BUFFA6+511
   1188 0C FF 2D93 3593       729         MVC   BUFER6+767(256),BUFFA6+767
                              730
   118E 3C 19 1454            731 DOWRT   MVI   R,25                SETUP TO WRITE RECORDS 25-29
   1192 3C 04 1458            732         MVI   N,4
   1196 0C 01 1DCA 1F8D       733         MVC   DFCB(2),ABUF        SETUP DATA REGISTER
   119C C0 87 1BF7            734         B     STRTIO              ISSUE THE SEEK
   11A0 00          11A0      735         DC    XL1'00'
   11A1 00          11A1      736         DC    XL1'00'
   11A2 144F        11A3      737         DC    AL2(DDCF)
   11A4 C0 87 1A96            738         B     SKBUSY
   11A8 C0 87 1C59            739         B     DEVERR              ANY ERRORS?
   11AC C0 87 11B0            740         B     *+4
                              741
   11B0 C0 87 1BF7            742         B     STRTIO              ISSUE WRITE KEY DATA
   11B4 02          11B4      743         DC    XL1'02'
   11B5 00          11B5      744         DC    XL1'00'
   11B6 144F        11B7      745         DC    AL2(DDCF)
   11B8 C0 87 1AE6            746         B     ATTBSY              CHECK ATTACHMENT BUSY
   11BC C0 87 1C59            747         B     DEVERR              ANY ERRORS?
   11C0 C0 87 11C4            748         B     *+4
                              749
   11C4 3C 21 1454            750         MVI   R,33                SETUP FOR WRITING RECORDS
   11C8 3C 04 1458            751         MVI   N,4                  33-37 (SAME AS RECORDS 25-29)
   11CC C0 87 1BF7            752         B     STRTIO
   11D0 02          11D0      753         DC    XL1'02'             WRITE
   11D1 00          11D1      754         DC    XL1'00'             KEY-DATA
   11D2 144F        11D3      755         DC    AL2(DDCF)
   11D4 C0 87 1AE6            756         B     ATTBSY              CHECK ATTACHMENT BUSY
   11D8 C0 87 1C59            757         B     DEVERR              ANY ERRORS?
   11DC C0 87 11E0            758         B     *+4
                              759
   11E0 C0 87 12A4            760         B     DONE                CHECK FOR FINISHED
                              761 *
                              762 *       WRITE FA0 ON TRACK 2 (OR ITS ALTERNATE) HERE
                              763 *
   11E4                       764 WRFA0   EQU   *
   11E4 C0 87 1BF7            765         B     STRTIO              SEEK CYL0, TRACK 2
   11E8 00          11E8      766         DC    XL1'00'
   11E9 00          11E9      767         DC    XL1'0'
   11EA 1DCD        11EB      768         DC    AL2(WDFCF)
   11EC C0 87 1A96            769         B     SKBUSY              CHECK SEEK BUSY
   11F0 C0 87 1C59            770         B     DEVERR              ANY ERRORS?
   11F4 C0 87 11F8            771         B     *+4
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              772
                              773         MVC   DFDR(2),ALTADR
 11F8 0C 01 1DCA 17C8         774         B     STRTIO                READ HA-R0 TO DETERMINE IF DEFECT
 11FE C0 87 1BF7              775         DC    XL1'01'
 1202 01              1202    776         DC    XL1'01'
 1203 01              1203    777         DC    AL2(RDFCF)
 1204 1DD7            1205    778         B     ATTESY                CHECK ATTACHMENT BUSY
 1206 C0 87 1AE6              779         B     DEVERR                ANY ERRORS
 120A C0 87 1C59              780         B     *+6
 120E C0 87 1212              781
                              782         TBN   RDFCF,X'02'           CHECK FOR THIS TRACK DEFECTIVE
 1212 38 02 1DD7              783         JT    DOALT                 IF SO, GO SETUP FOR IT
 1216 F2 10 09                784         MVC   OUTREC+4(5),NODEF     OTHERWISE INDICATE GOOD CYL, TRACK
 1219 0C 04 16C8 16C1         785         J     SETWRT                AND GO DO THE WRITE
 121F F2 87 2E                786
                              787 DOALT   B     STRTIO                SEEK TO THE ALTERNATE
 1222 C0 87 1BF7              788         DC    XL1'0'
 1226 00              1226    789         DC    XL1'0'
 1227 00              1227    790         DC    AL2(OUTREC)
 1228 16C4            1229    791         B     SKBUSY                CHECK SEEK BUSY
 122A C0 87 1A96              792         B     DEVERR                ANY ERORS
 122E C0 87 1C59              793         B     *+6
 1232 C0 87 1236              794
                              795         MVC   DFDR(2),ALTADR
 1236 0C 01 1DCA 17C8         796         B     STRTIO                READ HA-R0 OF ALTERNATE
 123C C0 87 1BF7              797         DC    XL1'01'
 1240 01              1240    798         DC    XL1'01'
 1241 01              1241    799         DC    AL2(RDFCF)
 1242 1DD7            1243    800         B     ATTBSY                CHECK ATTACHMENT BUSY
 1244 C0 87 1AE6              801         B     DEVERR                ANY ERRORS
 1248 C0 87 1C59              802         B     *+6
 124C C0 87 1250              803
                              804 SETWRT  MVI   RR,X'01'              SETUP FOR WRITE AT R1
 1250 3C 01 168F              805         MVI   NN,X'2D'              AND WRITE 46 RECORDS
 1254 3C 2D 1688              806         MVC   HH(5),OUTREC+4        PUT IN CORRECT CYL AND HEAD VALUES
 1258 0C 04 1686 16C8         807         MVC   DFDR(2),BUFF18        DDDR --> 170TH MICRO INSTRUCTION
 125E 0C 01 1DCA 16AF         808         B     STRTIO                ISSUE WRITE KEY DATA
 1264 C0 87 1BF7              809         DC    XL1'02'               FOR 46 RECORDS
 1268 02              1268    810         DC    XL1'00'
 1269 00              1269    811         DC    AL2(WRTCF)
 126A 1682            1268    812         B     ATTESY                CHECK ATTACHMENT BUSY
 126C C0 87 1AE6              813         B     DEVERR                ANY ERRORS?
 1270 C0 87 1C59              814         B     *+6
 1274 C0 87 1278              815
                              816         MVI   RR,X'2F'              NOW SETUP TO WRITE 2 RECORDS
 1278 3C 2F 1687              817         MVI   NN,X'01'
 127C 3C 01 1688              818         MVC   DFDR(2),BUFF28        DDDR --> 1ST MICRO INSTRUCTION
 1280 0C 01 1DCA 1681         819 MOD1    MVC   BUFFA0-1(2),BUFFA0+X'2FFF'  MOVE UNUSED BYTES
 1286 0C 01 3BFF 68FF         820         B     STRTIO                ISSUE WRITE KEY DATA
 128C C0 87 1BF7              821         DC    XL1'02'               FOR 2 RECORDS
 1290 02              1290    822         DC    XL1'00'
 1291 00              1291    823         DC    AL2(WRTCF)
 1292 1682            1293    824         B     ATTBSY                CHECK ATTACHMENT BUSY
 1294 C0 87 1AE6              825         B     DEVERR                ANY ERRORS?
 1298 C0 87 1C59              826         B     *+6
 129C C0 87 12A0              827         B     DONE                  GO CHECK TO SEE IF FINISHED
 12A0 C0 87 12A4              828 *
                              829 *       THIS DETERMINES WHETHER TO TERMINATE OR HANDLE NEXT ENTRY
                              830 *
                   12A4       831 DONE    EQU   *
 12A4 35 01 144E              832         L     SAVPTR,XR1
 12A8 D2 01 02                833         LA    2(,XR1),XR1           INCREMENT TO NEXT ENTRY
 12AB 7D FF 00                834         CLI   0(,XR1),X'FF'         ARE THERE ANY MORE?
 12AE F2 81 06                835         JE    DONE1                 NO
 12B1 7D 40 00                836         CLI   0(,XR1),X'40'         ARE THERE ANY MORE
 12B4 F2 01 D3                837         JNE   NXTID                 YES
 12B7 38 80 0233              838 DONE1   TBN   UTAE+1,X'80'          RUNNING FROM DISK
 12BB F2 10 7D                839         JT    WR47
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                              840 *
                              841 *       NOW CYL 0, TRACK 0, RECORD 47 MUST BE UPDATED
                              842 *        (HANDLED DIFFERENTLY WHEN RUNNING FROM CARDS)
 12BE 3C 2F 1454              843         MVI   R,47                  SETUP TO READ R47
 12C2 3C 00 1458              844         MVI   N,0
 12C6 C0 87 1BF7              845         B     STRTIO                ISSUE THE SEEK
 12CA 00              12CA    846         DC    XL1'00'
 12CB 00              12CB    847         DC    XL1'00'
 12CC 144F            12CD    848         DC    AL2(DDCF)
 12CE C0 87 1A96              849         B     SKBUSY                CHECK SEEK BUSY
 12D2 C0 87 1C59              850         B     DEVERR                ANY ERRORS
 12D6 C0 87 12DA              851         B     *+6
                              852
 12DA 0C 01 1DCA 168F         853         MVC   DFDR(2),ABFR47        SETUP DATA REGISTER
 12E0 C0 87 1BF7              854         B     STRTIO                ISSUE READ KEY-DATA
 12E4 01              12E4    855         DC    XL1'01'
 12E5 00              12E5    856         DC    XL1'00'
 12E6 144F            12E7    857         DC    AL2(DDCF)
 12E8 C0 87 1AE6              858         B     ATTBSY                GO CHECK ATTACHMENT BUSY
 12EC C0 87 1C59              859         B     DEVERR                CHECK FOR ANY ERRORS
 12F0 C0 87 12F4              860         B     *+6
                              861
 12F4 3C 03 144C              862         MVI   COUNT,3               RUNNING FROM CARDS-UPDATE R47
 12F8 C2 01 156E              863         LA    HDRFA0,XR1            THIS POINTS TO HDR BUFFERS
 12FC C2 02 146E              864         LA    BUFR47,XR2            THIS POINTS TO R47 BUFFER
                              865
 1300 7D 00 0C                866 CKXX    CLI   12(,XR1),X'00'        WAS THIS PROGRAM UPDATED?
 1303 F2 81 1B                867         JE    SKMVC1
 1306 9C 03 03 5B             868         MVC   3(4,XR2),91(,XR1)     YES--FIRST SAVE ID AND LEVEL
 130A BC 00 04                869         MVI   4(,XR2),X'00'         PUT IN X'00' DELIMETER
 130D 9C 09 0E 14             870         MVC   14(10,XR2),20(,XR1)   SAVE PN
 1311 BC 05 14 1F95           871         MVC   20(6,XR2),ZERO        ZERO PART OF BUFFER
 1316 9C 09 1E 1F             872         MVC   30(10,XR2),31(,XR1)   SAVE EC
 131A BC 00 4F                873         MVI   79(,XR2),X'00'        ZERO REST OF FIELD
 131D AC 2F 4E 4F             874         MVC   78(48,XR2),79(,XR2)
                              875
 1321 D2 01 60                876 SKMVC1  LA    96(,XR1),XR1
 1324 E2 02 50                877         LA    80(,XR2),XR2
 1327 0F 00 144C 1BED         878         SH    COUNT(1),ONE          DONE?
 132D C0 01 1300              879         BNZ   CKXX
 1331 3C 00 156D              880         MVI   BUFR47+255,0          CLEAR OUT REST OF FIELD
 1335 0C 0E 156C 156D         881         MVC   BUFR47+254(15),BUFR47+255
 1338 3C 2F 1454              882 WR47    MVI   R,47                  WHEN DONE, WRITE R47 BACK
 133F 3C 00 1458              883         MVI   N,0
 1343 0C 01 1DCA 168F         884         MVC   DFDR(2),ABFR47
 1349 C0 87 1BF7              885         B     STRTIO                SEEK TO CYL0 HD0
 134D 00              1340    886         DC    XL1'00'
 134E 00              134E    887         DC    XL1'00'
 134F 144F            1350    888         DC    AL2(DDCF)
 1351 C0 87 1A96              889         B     SKBUSY                CHECK SEEK BUSY
 1355 C0 87 1C59              890         B     DEVERR                ANY ERRORS
 1359 C0 87 135D              891         B     *+6
                              892
 135D C0 87 1BF7              893         B     STRTIO                ISSUE WRITE KEY-DATA
 1361 02              1361    894         DC    XL1'02'
 1362 00              1362    895         DC    XL1'00'
 1363 144F            1364    896         DC    AL2(DDCF)
 1365 C0 87 1AE6              897         B     ATTBSY                CHECK ATTACHMENT BUSY
 1369 C0 87 1C59              898         B     DEVERR                ANY ERRORS
 136D C0 87 1371              899         B     *+6
 1371 38 80 0233              900         TBN   UTAE+1,X'80'          RUNNING FROM DISK?
 1375 F2 10 05                901         JT    DSPUPT                IF SO, GIVE NEXT DISPLAY
 1378 C0 87 022A              902         B     LOAD                  OTHERWISE TERMINATE
 137C 00              137C    903         DC    XL1'00'
                              904
                              905 *
                              906 *       NOW DISPLAY MESSAGE SAYING UPDATE COMPLETE
                              907 *
```

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

   137D C0 87 021A              908 DSPUPT B     PRINT               DISPLAY MESSAGE
   1381 06                 1381 909        DC    XL1'06'             FLAG
   1382 16                 1382 910        DC    IL1'22'             LENGTH
   1383 1918               1384 911        DC    AL2(TERM)           @ OF MESSAGE
   1385 C0 87 022A              912        B     LOAD                TERMINATE IF NO MORE
   1389 00                 1389 913        DC    XL1'00'
                                914
   138A 34 01 144E              915 NXTID  ST    SAVPTR,XR1
   138E C0 87 0DA4              916        B     CKFA0               CONTINUE
                                917 *
                                918 *       96 TO 80 COLUMN COMPRESSING
                                919 *
   1392 34 08 13FD              920 CMPRES ST    CMPRTN+3,ARR        SAVE RETURN ADDRESS
   1396 C2 01 0881              921        LA    INREC+1,XR1         XR1 POINTS TO FIRST UNCOMPRESSED
   139A 3C 54 144C              922        MVI   CCUNT,84            SET BYTE COUNT TO 84
   139E 7D D0 00                923 CMP00  CLI   0(,XR1),X'D0'       CHECK FOR X'D0'
   13A1 F2 01 03                924        JNE   CMP01
   13A4 7C 2A 00                925        MVI   0(,XR1),X'2A'       IF SO, CHANGE TO X'2A'
   13A7 D2 01 01                926 CMP01  LA    1(,XR1),XR1         INCREMENT POINTER
   13AA 0F 00 144C 1444         927        SLC   CCUNT(1),I1         DECREMENT COUNTER
   13B0 C0 01 139E              928        BNZ   CMP00               CONTINUE TILL DONE
   13B4 C2 01 0883              929        LA    INREC+3,XR1         XR1 --> FIRST 4 BYTE GROUP
   13B8 C2 02 16C7              930        LA    OUTREC+3,XR2        XR2 --> FIRST 3 BYTE GROUP
   13BC 3C 15 144C              931        MVI   COUNT,21            SET GROUP COUNT TO 21
                                932
   13C0 5E 00 01 01             933 CMP02  ALC   1(1,XR1),1(,XR1)    COMPRESS 4 INTO 3
   13C4 5E 00 01 01             934        ALC   1(1,XR1),1(,XR1)
   13C8 5E 01 01 01             935        ALC   1(2,XR1),1(,XR1)
   13CC 5E 01 01 01             936        ALC   1(2,XR1),1(,XR1)
   13D0 5E 02 01 01             937        ALC   1(3,XR1),1(,XR1)
   13D4 5E 02 01 01             938        ALC   1(3,XR1),1(,XR1)
   13D8 5E 03 01 01             939        ALC   1(4,XR1),1(,XR1)
   13DC 5E 03 01 01             940        ALC   1(4,XR1),1(,XR1)
   13E0 9C 02 00 00             941        MVC   0(3,XR2),0(,XR1)    MOVE 3 BYTES TO 3 BYTE GROUP
   13E4 D2 01 04                942        LA    4(,XR1),XR1         BUMP
   13E7 E2 02 03                943        LA    3(,XR2),XR2          POINTERS
   13EA 0F 00 144C 1444         944        SLC   COUNT(1),I1         BUMP COUNT
   13F0 C0 01 13C0              945        BNZ   CMP02               CONTINUE TILL DONE
   13F4 0C 3F 08BF 1703         946        MVC   INREC+63(64),OUTREC+63 MOVE COMPRESS RECORD TO INREC
   13FA C0 87 0000              947 CMPRTN B     *-*                 RETURN
                                948 *
                                949 *       COMPUTE VALUE OF THE POINTER HERE
                                950 *
   13FE 34 08 1432              951 COMPUT ST    CCMRTN+3,ARR
   1402 3B 80 0889              952        SBF   INREC+9,X'80'
   1406 0C 01 144C 1442         953        MVC   CCUNT,I0
   140C 0F 00 0888 1444         954 COMP00 SLC   INREC+8(1),I1
   1412 F2 82 08                955        JL    CCMP01
   1415 36 01 1434              956        A     1384,XR1
   1419 C0 87 140C              957        B     CCMP00
   141D 0C 00 144C C889         958 CCMF01 MVC   CCUNT(1),INREC+9
   1423 36 01 144C              959        A     COUNT,XR1
   1427 36 01 144C              960        A     CCUNT,XR1
   142B 36 01 144C              961        A     COUNT,XR1
   142F C0 87 0000              962 COMRTN B     *-*
   1433 0180               1434 963 I384   DC    IL2'384'
                                964 *       CONSTANTS AND EQUATES
                                965 *
   1435 F0F0F0F0           1438 966        DC    CL4'0000'           ID,LEVEL &
   1439 F0F0F0F0           143C 967 IDSEQ  DC    CL4'0000'                   SEQ STORAGE
   143D F0F0F0F1           1440 968 DEC1   DC    CL4'0001'           DECIMAL 1
   1441 00C0               1442 969 I0     DC    IL2'0'
   1443 0001               1444 970 I1     DC    IL2'1'
   1445 0003               1446 971 I3     DC    IL2'3'
   1447 0FFF               1448 972 FFF    DC    XL2'0FFF'
                           00FF 973 FF     EQU   X'FF'
   1449 00                 1449 974 SWITCH DC    XL1'00'
   144A 02                 144A 975 PLUS2  DC    XL1'02'
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```
ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT

                         0880  976 INREC  EQU   X'0880'
   144B 0000             144C  977 COUNT  DC    XL2'00'
   144D 0000             144E  978 SAVPTR DC    XL2'00'
                         144F  979 CDCF   EQU   *                   CONTROL FIELD
   144F 00               144F  980        DC    XL1'00'             FLAG
   1450 0000             1451  981        DC    XL2'00'             CYLINDER
   1452 0000             1453  982        DC    XL2'00'             HEAD
   1454 00               1454  983 R      DC    XL1'00'             RECORD NUMBER
   1455 00               1455  984        DC    XL1'00'             KEY LENGTH
   1456 0100             1457  985        DC    IL2'256'            DATA LENGTH
   1458 00               1458  986 N      DC    XL1'00'             NUMBER OF RECORDS
   1459 2800             145A  987 DCDF   DC    AL2(BUFFER)
   145B C5D9D9D6D9404040 1465  988 ERROR  DC    CL11'ERROR  '
   1463 40404C                 988
   1466 01E0             1467  989 FCR80  DC    IL2'480'
   1468 0028             1469  990 FCRTY  DC    IL2'40'
   146A 0000             146B  991 DRIVE# DC    XL2'00'
   146C 000B             146D  992 ELEVEN DC    IL2'11'
                         146E  993 BUFR47 EQU   *
   146E                  156D  994        DS    CL256
                         156E  995 HDRFA0 EQU   *
   156E                  15CD  996        DS    CL96
                         15CE  997 HDRFA6 EQU   *
   15CE                  162D  998        DS    CL96
                         162E  999 HDRFA7 EQU   *
   162E                  168D 1000        DS    CL96
   168E 14?E             168F 1001 ABFR47 DC    AL2(BUFR47)
   1690 0000             1691 1002 SDISP4 DC    XL2'00'
   1692 0000             1693 1003 SAV1   DC    XL2'00'
   1694 40404040404040   169A 1004 OLDEC  DC    7XL1'40'
   1698 000000000000     16A0 1005 SVUPDT DC    6XL1'00'
   16A1 FF               16A1 1006        DC    XL1'FF'
                         16A2 1007 DRIVES EQU   *
   16A2 D1               16A2 1008        DC    XL1'D1'
   16A3 D2               16A3 1009        DC    XL1'D2'
   16A4 FF               16A4 1010        DC    XL1'FF'
                         16A5 1011 IDS    EQU   *
   16A5 0FA0             16A6 1012 FA0    DC    XL2'FA0'
   16A7 0FA6             16A8 1013 FA6    DC    XL2'FA6'
   16A9 0FA7             16AA 1014 FA7    DC    XL2'FA7'
   16AB FF               16AB 1015        DC    XL1'FF'
   16AC 0005             16AD 1016 FIVE   DC    IL2'5'
   16AE 3DFE             16AF 1017 BUFF10 DC    AL2(BUFFA0+510)
   16B0 3BFE             16B1 1018 BUFF20 DC    AL2(BUFFA0-2)
   16B2 00               16B2 1019 WRTCF  DC    XL1'00'             WRITE CONTROL FIELD
   16B3 0000             16B4 1020        DC    XL2'00'
   16B5 0002             16B6 1021 HH     DC    XL2'0002'
   16B7 01               16B7 1022 RR     DC    XL1'01'
   16B8 00               16B8 1023        DC    XL1'00'
   16B9 0100             16BA 1024        DC    IL2'256'
   16BB 2D               16BB 1025 NN     DC    XL1'2D'
   16BC 00               16BC 1026 WRT2   DC    XL1'00'
   16BD 000000           16BF 1027        DC    XL3'00'
   16C0 0002             16C1 1028 NODEF  DC    XL2'0002'
   16C2 00               16C2 1029 HARSAV DC    XL1'00'
   16C3 00               16C3 1030 CARSAV DC    XL1'00'
                         16C4 1031 OUTREC EQU   *
   16C4                  17C3 1032        DS    256XL1
   17C4 16C4             17C5 1033 ALTADR DC    AL2(OUTREC)
   17C6 0000             17C7 1034 CL3    DC    XL2'00'
   17C8 0000             17C9 1035 HL3    DC    XL2'00'
   17CA 0000             17CB 1036 CLW    DC    XL2'00'
   17CC 0000             17CD 1037 HLW    DC    XL2'00'
   17CE 0000             17CF 1038 CPW    DC    XL2'00'
   17D0 0000             17D1 1039 HPW    DC    XL2'00'
   17D2 0000             17D3 1040 WORK   DC    XL2'00'
   17D4 000C             17D5 1041 TWELVE DC    IL2'12'
   17D6 00               17D6 1042 PCCUNT DC    XL1'00'
```

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ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

    17D7 00FF                17C8 1043 CKER   DC    XL2'00FF'
    17D9 E261F340            17DC 1044 MSG3   DC    CL4'S/3 '
    17DD 4040404040404040    1850 1045 MSG3P  DC    116XL1'40'
    17E5 4040404040C4C040          1045
    17ED 4040404040C4C040          1045
    17F5 4040404040404040          1045
    17FD 4040404040404040          1045
    1805 4040404040404040          1045
    180D 4040404040404040          1045
    1815 4040404040C4C040          1045
    181D 4040404040404040          1045
    1825 404C4C4040404040          1045
    182D 404C4C4040C4C040          1045
    1835 4040404040404040          1045
    183D 4040404040404040          1045
    1845 4040404040404040          1045
    184D 40404040                  1045
    1851 E6C5D540            18E4 1046 MSGB   DC    CL4'WIN '
    1855 4040404040404040    18C8 1047 MSGBP  DC    116XL1'40'
    185D 404C4040404C4040          1047
    1865 4040404040C4C040          1047
    186D 4040404040404040          1047
    1875 404C4C4040C4C040          1047
    187D 4040404040404040          1047
    1885 4040404040404040          1047
    188D 4040404040404040          1047
    1895 4040404040404040          1047
    189D 4040404040404040          1047
    18A5 4040404040C4C040          1047
    18AD 4040404040404040          1047
    18B5 4040404040C4C040          1047
    18BD 4040404040404040          1047
    18C5 40404040                  1047
    18C9 C1C3E3              18CB 1048 ACT    DC    CL3'ACT'
    18CC C6C1F740D5D6E340    18DC 1049         DC    CL17'FA7 NOT ON PACK--'
    18D4 D6D540D7C1C3D260          1049
    18DC 60                        1049
    18DD C1C4C440C9E340E3    1902 1050 MSGFA7 DC    CL38'ADD IT TC THE PACK AND THEN RELOAD FC2'
    18E5 D640E3C8C540D7C1          1050
    18ED C3D240C1D5C440E3          1050
    18F5 C8C5D540D9C5D3D6          1050
    18FD C1C440C6C3F2              1050
    1903 404040E2C5C3E3C9    1918 1051 TERM   DC    CL22'   SECTION TERMINATED '
    1908 D6D540E3C5D9D4C9          1051
    1913 D5C1E3C5C440              1051
    1919 4040C4C1E3C140D4    1940 1052 UPDATE DC    CL40'  DATA MODULE IS NOW BEING UPDATED      '
    1921 D6C4E4D3C540C9E2          1052
    1929 40D5D6E640C2C5C9          1052
    1931 D5C740E4D7C4C1E3          1052
    1939 C5C4404040404040          1052
    1941 D7D3C1C3C540C4C5    1967 1053 MGFA7  DC    CL39'PLACE DECK FA7 IN LOADER-RESET THE HALT'
    1949 C3D240C6C1F740C9          1053
    1951 D540D3D6C1C4C5D5          1053
    1959 60D9C5E2C5E340E3          1053
    1961 C8C540C8C1D3E3            1053
    1968 D7D3C1C3C540C4C5    19EE 1054 MSGFA6 DC    CL39'PLACE DECK FA6 IN LOADER-RESET THE HALT'
    1970 C3D240C6C1F640C9          1054
    1978 D540D3D6C1C4C5D5          1054
    1980 60D9C5E2C5E340E3          1054
    1988 C8C540C8C1D3E3            1054
    198F D7D3C1C3C540C3F1    19C0 1055 MSGFA0 DC    CL50'PLACE C17 FOLLOWED BY FA0 IN LOADER-RESET THE HALT'
    1997 F740C6D6D3D3D6E6          1055
    199F C5C440C2E840C6C1          1055
    19A7 F040C9D540D3D6C1          1055
    19AF C4C5D960D9C5E2C5          1055
    19B7 E340E3C8C540C8C1          1055
    19BF D3E3                      1055
    19C1 D7D9D6C7D9C1D440    19E6 1056 MSGC17 DC    CL38'PROGRAM C17 WILL DO THE LOADING OF FA0'
```


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ERR LOC OBJECT CODE        ADDR STMT SOURCE STATEMENT

    19C9 C3F1F740E6C9D3D3          1056
    19D1 40C4D640E3C8C540          1056
    19D9 D3D6C1C4C9D5C740          1056
    19E1 D6C640C6C1F0              1056
    19E7 D5D6E3C57A40E8D6    1A0E 1057 MGNOTE DC    CL40'NOTE: YOU ARE RUNNING FROM ALT LOADER   '
    19EF E440C1D9C540D9E4          1057
    19F7 D5E5C9D5C740C6D9          1057
    19FF D6D440C1D3E340D3          1057
    1A07 D6C1C4C5D9404040          1057
    1A0F C9C640F3F3F4F040    1A36 1058         DC    CL40'IF 3340 MICRO-CODE NOT LOADED, FA0 MUST '
    1A17 D4C9C3D9D6E6C3D6          1058
    1A1F C4C540D5D6E340D3          1058
    1A27 D6C1C4C5C46B40C6          1058
    1A2F C1F040D4E4E2E340          1058
    1A37 C2C540E4D7C4C1E3    1A40 1059         DC    CL10'BE UPDATED'
    1A3F C5C4                      1059
    1A41 4DE6C8C9C3C840C3    1A69 1060 MG1    DC    CL41'(WHICH CAUSES CONTROL STORE TO BE LOADED)'
    1A49 C1E4E2C5E240C3D6          1060
    1A51 D5E3D9D6D340E2E3          1060
    1A59 D6D9C540E3D640C2          1060
    1A61 C540D3D6C1C4C5C4          1060
    1A69 5D                        1060
    1A6A C2C5C6D6D9C540C6    1A89 1061 MG2    DC    CL32'BEFORE FA6 OR FA7 CAN BE UPDATED'
    1A72 C1F640D6D940C6C1          1061
    1A7A F740C3C1D540C2C5          1061
    1A82 40E4D7C4C1E3C5C4          1061
    1A8A D7D540              1A8C 1062 PN     DC    CL3'PN '
    1A8D C5C340              1A8F 1063 EC     DC    CL3'EC '
    1A90 9000                1A91 1064 X9000  DC    XL2'9000'
    1A92 8000                1A93 1065 X8000  DC    XL2'8000'
    1A94 0203                1A95 1066 X203   DC    XL2'0203'
                             2A94 1067 BUFER6 EQU   X'2A94'
                             3000 1068 BUFFA7 EQU   X'3000'
                             3294 1069 BUFFA6 EQU   X'3294'
                             3C00 1070 BUFFA0 EQU   X'3C00'
                             2A20 1071 CARFEQ EQU   X'2A20'
                             2A22 1072 HARREQ EQU   X'2A22'
                             3293 1073 ENDFA7 EQU   X'3293'
                             0232 1074 UTAB   EQU   X'0232'
```

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1076 *
                         1077 *       THIS SUBROUTINE CHECKS SEEK BUSY CONDITION
                         1078 *
 1A96 34 08 1AE5         1079 SKBUSY ST    EESY+3,ARR          SAVE FOR RETURNING
 1A9A C2 01 07D0         1080        LA    2000,XR1            SET FOR 1 SEC. DELAY
 1A9E C0 87 1C31         1081        B     SEKBSY              TO TEST FOR SEEK BUSY
 1AA2 C0 87 1AE2         1082        B     EESY                RETURN TO MAIN PROGRAM
 1AA6 0D 8F 18D2 18D2    1083        CLC   WORK+255(144),WORK+255    DELAY
 1AAC 36 01 1DC4         1084        A     NEG1,XR1            DECREMENT COUNTER
 1AB0 C0 01 1A9A         1085        BNZ   SKBUSY+4            LOOP IF NOT DONE
                         1086
 1AB4 C0 87 021A         1087        B     PRINT               TO PRINT ERROR 9255
 1AB8 C6                 1AB8 1088   DC    XL1'C6'             FLAGS
 1AB9 1A                 1AB9 1089   DC    IL1'26'             LENGTH
 1ABA 1AE1               1ABB 1090   DC    AL2(ER6255)         MESSAGE ADDRESS
 1ABC C105               1ABD 1091   DC    XL2'C105'           MESSAGE ID
                         1092
 1ABE C0 87 0222         1093        B     HALT                TO DCP ERROR HALT
 1AC2 C105               1AC3 1094   DC    XL2'C105'           HALT ID
 1AC4 C0 87 1ABE         1095        B     *-6                 LOOP ON HALT
                         1096
 1AC8 C2E4E2E840E3D6D6 1AE1 1097 ER6255 DC    CL26'BUSY TOO LONG AFTER A SEEK'
 1AD0 40C3D6D5C740C1C6   1097
 1AD8 E3C5D940C140E2C5   1097
 1AE0 C5D2               1098 EBSY   B     *-*                 RETURN
                         1099 *
                         1100 *       THIS SUBROUTINE TESTS ATTACHMENT BUSY
                         1101 *
 1AE6 34 08 1B33         1102 ATTBSY ST    EATT+3,ARR          SAVE FOR RETURNING
 1AEA C2 01 0190         1103        LA    400,XR1             SET FOR 200 MS. DELAY
 1AEE C0 87 1C45         1104        B     ATHBSY              TO TEST FOR ATTACHMENT BUSY
 1AF2 C0 87 1B30         1105        B     EATT                RETURN FOR NOT BUSY
 1AF6 0D 8F 18D2 18D2    1106        CLC   WORK+255(144),WORK+255    DELAY
 1AFC 36 01 1DC4         1107        A     NEG1,XR1            DECREMENT COUNTER
 1B00 C0 01 1AEA         1108        BNZ   ATTBSY+4            LOOP IF NOT DONE
 1B04 C0 87 021A         1109        B     PRINT               TO PRINT ERROR 9275
 1B08 C6                 1B08 1110   DC    XL1'C6'             FLAGS
 1B09 18                 1B09 1111   DC    IL1'24'             LENGTH
 1B0A 1B2F               1B0B 1112   DC    AL2(ER6275)         MESSAGE ADDRESS
 1B0C C106               1B0D 1113   DC    XL2'C106'           MESSAGE ID
                         1114
 1B0E C0 87 0222         1115        B     HALT                TO DCP ERROR HALT
 1B12 C106               1B13 1116   DC    XL2'C106'           HALT ID
 1B14 C0 87 1B0E         1117        B     *-6                 LOOP ON HALT
                         1118
 1B18 C1E3E3C1C3C8D4C5 1B2F 1119 ER6275 DC    CL24'ATTACHMENT BUSY TOO LONG'
 1B20 D5E34CC2E4E2E840   1119
 1B28 E3D6D640D3D6D5C7   1119
                         1120
 1B30 C0 87 0000         1121 EATT   B     *-*                 RETURN TO MAIN PROGRAM
 1B34 00                 1B34 1122 CKCTR  DC    XL1'0'
 1B35 00                 1B35 1123 ERRCTR DC    XL1'0'
 1B36 00                 1B36 1124 RECLSW DC    XL1'0'
 1B37 00                 1B37 1125 RDPASS DC    XL1'0'
 1B38 1B52               1B39 1126 READA  DC    AL2(A27-8)          READ ADDRESS
 1B3A 1B45               1B3B 1127 WRITEA DC    AL2(A08)            WRITE ADDRESS
 1B3C C6C3C3C8C8         1B40 1128        DC    CL5'FCCHH'
 1B41 00                 1B41 1129        DC    XL1'0'
 1B42 00                 1B42 1130        DC    XL1'0'
 1B43 0008               1B44 1131        DC    IL2'08'             DATA LENGTH FOR R0
                         1B45 1132 A08    EQU   *                   R0 DATA TO BE WRITTEN
 1B45 0000               1B46 1133        DC    XL2'0'
 1B47 C3C3C8C8           1B4A 1134 A19    DC    CL4'CCHH'
 1B48 1B48               1B4C 1135 TBLENA DC    AL2(*)
 1B4D C6C3C3C8C8C6C3C3 1B5A 1136 A27    DC    CL14'FCCHHFCCHH0008'
 1B55 C8C8F0F0F0F8       1136
                         1137
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FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1138 *            DISK SELECTION SUBROUTINE
                         1139
                         1140 *            CALLING SEQUENCE
                         1141
                         1142 *       B    SELDSK              CALL
                         1143 *       DC   XL1'D1'             DISK TO BE SELECTED (D1,D2,D3 OR D4)
                         1144 *       B    *-*                 RETURN IF DISK IS NOT AVAILABLE
                         1145 *       B    *-*                 RETURN IF SELECTED DISK IS AVAILABLE
                         1146
 1B5B 34 08 1BEA         1147 SELDSK ST    DSKEXT+3,ARR        SAVE RETURN ADDRESS
                         1148
 1B5F 35 01 1BEA         1149 SELB   L     DSKEXT+3,XR1        PUT PARMETER ADDRESS IN XR1
 1B63 0E 01 1BEA 1BED    1150        ALC   DSKEXT+3(2),ONE     STEP EXIT ADDRESS
 1B69 3C C0 1BF2         1151        MVI   MODBIT,X'C0'        INITIALIZE ALL I/O
 1B6D 3C C6 1C24         1152        MVI   LCTRL+1,X'C6'        COMMANDS FOR DRIVE 1
 1B71 3C C0 1C71         1153        MVI   TIOERR+1,X'C0'
 1B75 3C C4 1C28         1154        MVI   LCATA+1,X'C4'
 1B79 3C C2 1C52         1155        MVI   TIOBSY+1,X'C2'
 1B7D 3C C1 1C3E         1156        MVI   TIOSEK+1,X'C1'
 1B81 7D D1 00           1157        CLI   0(,XR1),X'D1'
 1B84 F2 81 5A           1158        JE    SETRUN
                         1159
 1B87 7D D2 00           1160        CLI   0(,XR1),X'D2'       TEST FOR SELECT DRIVE 2
 1B8A F2 01 1B           1161        JNE   C3                  IF NOT DRIVE 2 GO CHECK FOR DRIVE 3
 1B8D 3C C8 1BF2         1162        MVI   MODBIT,X'C8'        INITIALIZE ALL I/O
 1B91 3C CE 1C24         1163        MVI   LCTRL+1,X'CE'        COMMANDS FOR DRIVE 2
 1B95 3C C8 1C71         1164        MVI   TIOERR+1,X'C8'
 1B99 3C CC 1C28         1165        MVI   LCATA+1,X'CC'
 1B9D 3C CA 1C52         1166        MVI   TIOBSY+1,X'CA'
 1BA1 3C C9 1C3E         1167        MVI   TIOSEK+1,X'C9'
 1BA5 F2 87 39           1168        J     SETRUN
                         1169
 1BA8 7D D3 00           1170 C3     CLI   0(,XR1),X'D3'       TEST FOR SELECT DRIVE 3
 1BAB F2 01 1B           1171        JNE   C4                  IF NOT 3 IT HAS TO BE 4
 1BAE 3C D0 1BF2         1172        MVI   MODBIT,X'D0'        INITIALIZE ALL I/O
 1BB2 3C D6 1C24         1173        MVI   LCTRL+1,X'D6'        COMMANDS FOR DRIVE 3
 1BB6 3C D0 1C71         1174        MVI   TIOERR+1,X'D0'
 1BBA 3C D4 1C28         1175        MVI   LCATA+1,X'D4'
 1BBE 3C D2 1C52         1176        MVI   TIOBSY+1,X'D2'
 1BC2 3C D1 1C3E         1177        MVI   TIOSEK+1,X'D1'
 1BC6 F2 87 18           1178        J     SETRUN
                         1179
 1BC9 3C D8 1BF2         1180 C4     MVI   MODBIT,X'D8'        INITIALIZE ALL I/O
 1BCD 3C DE 1C24         1181        MVI   LCTRL+1,X'DE'        COMMANDS FOR DRIVE 4
 1BD1 3C D8 1C71         1182        MVI   TIOERR+1,X'D8'
 1BD5 3C DC 1C28         1183        MVI   LCATA+1,X'DC'
 1BD9 3C DA 1C52         1184        MVI   TIOBSY+1,X'DA'
 1BDD 3C D9 1C3E         1185        MVI   TIOSEK+1,X'D9'
 1BE1 0E 01 1BEA 1DC6    1186 SETRUN ALC   DSKEXT+3(2),FOUR    STEP EXIT ADDRESS
 1BE7 C0 87 0000         1187 DSKEXT B     *-*                 EXIT
 1BEB 000001       1BED  1188 ONE    DC    XL3'01'
 1BEE 0002         1BEF  1189 TWO    DC    XL2'02'
 1BF0 0003         1BF1  1190 THREE  DC    XL2'03'
 1BF2 00           1BF2  1191 MODBIT DC    XL1'0'
 1BF3 8001         1BF4  1192 XREG   DC    XL2'8001'
 1BF5 0003         1BF6  1193 SVEREG DC    XL2'0003'
```

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1195 *            START I/O SUBROUTINE
                         1196
                         1197 *            LINKAGE
                         1198 *       B    STRTIO              CALL
                         1199 *       DC   XL1'0'              CONTROL CODE,1/2 Q BYTE BITS 4-7
                         1200 *       DC   XL1'0'              FUNCTION CODE, R BYTE
                         1201 *       DC   AL2(*)              CONTROL FIELD ADDRESS
                         1202 *                                GOOD RETURN
                         1203
                         1204 STRTIO ST    SNSEXT+3,ARR       STORE PARAMETER POINTER.
                         1205        MVC   SIO+1(1),MODBIT    SETUP FOR CORRECT DRIVE
                         1206        L     SNSEXT+3,XR1       PUT PARAMETER POINTER IN XR1.
                         1207        MNN   SIO+1,0(,XR1)      TRANSFER 1/2 Q BYTE TO SIO
                         1208        MVC   SIO+2(1),1(,XR1)   TRANSFER R BYTE TO SIO
                         1209        MVC   DFCR(2),3(,XR1)    TRANSFER CONTROL FIELD ADDRESS
 18F7 34 08 1D8D         1210        SBF   SIO+1,X'08'        TURN OFF FILE 2 OR 4 SELECT BIT
 18FB 0C 00 1C2C 18F2    1211        TBF   MODBIT,X'08'       TEST FOR RUN ON FILE 1 OR 3
 1C01 35 01 1D8D         1212        JT    *+7                JUMP IF YES
 1C05 18 03 1C2C 00      1213        SBN   SIO+1,X'08'        IF NO, SET ON FILE 2 OR 4 BIT
 1C0A 1C 00 1C2D 01      1214 LCTRL  LIO   DFCR,X'C6'         LOAD CONTROL FIELD ADDRESS.
 1C0F 1C 01 1DCC 03      1215 LDATA  LIO   DFDR,X'C4'         LOAD DATA FIELD ADDRESS
 1C14 38 08 1C2C         1216 SIO    SIO   0,X'C0'            START I/O
 1C18 39 08 1BF2         1217        B     4(,XR1)            NORMAL EXIT
 1C1C F2 10 04           1218
 1C1F 3A 08 1C2C         1218
 1C23 31 C6 1DCC         1219 *            SUBROUTINE TO TEST FOR SEEK BUSY
 1C27 31 C4 1DCA         1220
 1C2B F3 C0 00           1221 *            CALLING SEQUENCE
 1C2E D0 87 04           1222
                         1223 *       B    SEKBSY             CALL
                         1224 *       B    NOTBSY             RETURN FOR NOT BUSY
                         1225 *                                RETURN FOR BUSY
                         1226
                         1226
 1C31 34 08 1C44         1227 SEKBSY ST    TIOEXT+3,ARR       SET RETURN ADDRESS FOR NOT BUSY
 1C35 36 08 1DC6         1228        A     FOUR,ARR
 1C39 34 08 1C40         1229        ST    TIOSEK+3,ARR       SET RETURN ADDPESS FOR BUSY
 1C3D C1 C1 0000         1230 TIOSEK TIO   *-*,X'C1'          TEST FOR SEEK BUSY
 1C41 C0 87 0000         1231 TIOEXT B     *-*                RETURN FOR NOT BUSY
                         1232
                         1233 *            22 MACHINE CYCLES FOR EACH PASS ON BUSY = 33.44 MICROSEC.
                         1234
                         1234
                         1235 *            SUBROUTINE TO TEST FOR ATTACHMENT BUSY
                         1236
                         1237 *            CALLING SEQUENCE
                         1238
                         1239 *       B    ATHBSY             ROUTINE CALL
                         1240 *       B    NOTBSY             RETURN FOR NOT BUSY
                         1241 *                                RETURN FOR BUSY
                         1242
 1C45 34 08 1C58         1243 ATHBSY ST    ATHEXT+3,ARR       SAVE RETURN ADDRESS FOR NOT BUSY
 1C49 36 08 1DC6         1244        A     FOUR,ARR
 1C4D 34 08 1C54         1245        ST    TIOBSY+3,ARR       SET RETURN ADDRESS FOR BUSY
 1C51 C1 C2 0000         1246 TIOBSY TIO   *-*,X'C2'          TEST FOR ATTACHMENT BUSY
 1C55 C0 87 0000         1247 ATHEXT B     *-*                RETURN FOR NOT BUSY
                         1248
                         1249 *            SUBROUTINE TO TEST FOR DEVICE ERROR OR NOT READY
                         1250
                         1251 *            CALLING SEQUENCE
                         1252
                         1253 *       B    DEVERR             ROUTINE CALL
                         1254 *       B    ERROR              RETURN FOR ERROR OR NOT READY
                         1255 *       B    GOOD               RETURN FOR READY
                         1256
 1C59 34 08 1C6B         1257 DEVERR ST    TERROR+3,ARR       SAVE RETURN ADDRESS
 1C5D 36 08 1DC6         1258        A     FOUR,ARR
 1C61 34 08 1C6F         1259        ST    DEVEXT+3,ARR       STORE READY ADDRESS
```


FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

 1C65 F2 87 08           1260        J     TIOERR             GO CHECK FOR AN ERROR
 1C68 C0 87 0000         1261 TERROR B     *-*                RETURN WITH AN ERROR INDICATION
 1C6C C0 87 0000         1262 DEVEXT B     *-*                RETURN FOR READY
                         1263
                         1264 *
                         1265 *            THIS WILL CHECK FOR AN ERROR AND IF THERE IS ONE,
                         1266 *            SAVE THE 24 BYTES OF DIAGNOSTIC SENSE INFORMATION.
                         1267 *
 1C70 C1 C0 1C78         1268 TIOERR TIO   RDDIAG,X'C0'       NOT READY/ERROR?
 1C74 C0 87 1C6C         1269        B     DEVEXT             NO-MAKE GOOD RETURN
                         1270 *
                         1271 *            ON ERROR INDICATIONS RETURN HERE
                         1272 *
                         1273 RDDIAG EQU   *
 1C78 C0 87 1D93         1274        B     SENSE              SAVE STATUS
 1C7C 05                 1275        DC    XL1'05'
 1C7D 38 01 1DC8         1276        TBN   STATUS,X'01'       ADAPTER CHECK?
 1C81 F2 90 1B           1277        JF    NADAP
 1C84 C0 87 021A         1278        B     PRINT              PRINT
 1C88 C2                 1279        DC    XL1'C2'            ADAPTER
 1C89 0D                 1280        DC    IL1'13'            CHECK
 1C8A 1D4B               1281        DC    AL2(MSGADP)
 1C8C C108               1282        DC    XL2'C108'
 1C8E C0 87 1E39         1283        B     PRTSNS             PRINT STATUS
 1C92 85                 1284        DC    XL1'85'
 1C93 0000               1285        DC    XL2'00'
 1C95 C0 87 0222         1286        B     HALT
 1C99 C108               1287        DC    XL2'C108'
 1C9B C0 87 1C95         1288        B     *-6
                         1289
 1C9F 39 F0 1DC7         1290 NADAP  TBF   STATUS-1,X'F0'      ANY UNIT CHECK?
 1CA3 F2 10 0A           1291        JT    NUNCK
 1CA6 C0 87 1E39         1292        B     PRTSNS             INDICATE STATUS ERRORS
 1CAA 85                 1293        DC    XL1'85'
 1CAB 00C0               1294        DC    XL2'00'
 1CAD F2 87 11           1295        J     RDIAG              GO INDICATE READ DIAG INFO
                         1296
 1CB0 C0 87 1E39         1297 NUNCK  B     PRTSNS             JUST PRINT STATUS
 1CB4 85                 1298        DC    XL1'85'            FOR ANY OTHER ERROR
 1CB5 0000               1299        DC    XL2'00'
 1CB7 C0 87 0222         1300        B     HALT
 1CBB C10A               1301        DC    XL2'C10A'
 1CBD C0 87 1CB7         1302        B     *-6
                         1303
                         1304 *
 1CC1 0C 01 1DCA 1D3E    1305 RDIAG  MVC   DFDR(2),ADIAG      SETUP FOR DATA FIELD
 1CC7 C0 87 1BF7         1306        B     STRTIO             ISSUE
 1CCB 01                 1307        DC    XL1'01'            READ
 1CCC 07                 1308        DC    XL1'07'            DIAG SENSE
 1CCD 1DD7               1309        DC    AL2(RDFCF)         (NOT REALLY USED)
 1CCF C0 87 1AE6         1310        B     ATTBSY
 1CD3 C0 87 1CD7         1311        B     *+4
                         1312
 1CD7 34 01 1D1C         1313        ST    SAVXR1+3,XR1       SAVE XR1
 1CDB 34 02 1D20         1314        ST    SAVXR2+3,XR2       SAVE XR2
 1CDF C2 01 1D24         1315        LA    DIAG-1,XR1         XR1 POINTS TO THE DIAG SNS INFO
 1CE3 C2 02 1DE5         1316        LA    MSGSNS-35,XR2      XR2 POINTS TO THE UNPACKED DATA
                         1317
 1CE7 D2 01 02           1318 REPET  LA    2(,XR1),XR1
 1CEA E2 02 05           1319        LA    5(,XR2),XR2
 1CED 34 01 1CFB         1320        ST    FROM1,XR1
 1CF1 34 02 1CFD         1321        ST    TO,XR2
 1CF5 C0 87 021E         1322        B     UNPACK             UNPACK 2 BYTES AT A TIME
 1CF9 02                 1323        DC    XL1'02'
 1CFA 0000               1324 FROM1  DC    AL2(*-*)
 1CFC 0000               1325 TO     DC    AL2(*-*)
 1CFE BD FF 01           1326        CLI   1(,XR2),X'FF'      FINISHED?
 1D01 C0 01 1CE7         1327        BNE   REPET
```

```
FC21      3340 IPL FORMAT PROGRAM        --MODEL 12

ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                                                                   PRINT INFO WHEN DONE
    1D05 C0 87 021A             1328          B      PRINT
    1D09 46                1D09 1329          DC     XL1'46'
    1D0A 46                1D0A 1330          DC     IL1'70'
    1D0B 1D91              1D0C 1331          DC     AL2(MSGSN1)
    1D0D C109              1D0E 1332          DC     XL2'C109'
    1D0F C0 87 0222             1333          B      HALT
    1D13 C109              1D14 1334          DC     XL2'C109'
    1D15 C0 87 1D0F             1335          B      *-6
                                1336
    1D19 C2 01 0000             1337 SAVXR1 LA     *-*,XR1             RESTORE XR1
    1D1D C2 02 0000             1338 SAVXR2 LA     *-*,XR2             RESTORE XR2
    1D21 C0 87 1C68             1339          B      TERROR              GIVE ERROR RETURN
                                1340                                     DESTINATION FIELD FOR 24 BYTES OF
                           1D25 1341 DIAG   EQU    *                     DIAGNOSTIC SENSE INFORMATION
    1D25 0000000000000000 1D3C 1342          DC     24XL1'00'
    1D2D 0000000000000000      1342
    1D35 0000000000000000      1342
    1D3D 1D25              1D3E 1343 ADIAG  DC     AL2(DIAG)
                                1344
    1D3F C1C4C1D7E3C5D940 1D4B 1345 MSGADP DC     CL13'ADAPTER CHECK'
    1D47 C3C8C5C3D2            1345
    1D4C C4C9C1C740E2C5D5 1D78 1346 MSGSNS DC     CL45'DIAG SENSE-XXXX XXXX XXXX XXXX XXXX XXXX XXXX'
    1D54 E2C560E7E7E7E740      1346
    1D5C E7E7E7E740E7E7E7      1346
    1D64 E740E7E7E7E740E7      1346
    1D6C E7E7E740E7E7E7E7      1346
    1D74 40E7E7E7E7            1346
    1D79 40E7E7E7E740E7E7 1D91 1347 MSGSN1 DC     CL25' XXXX XXXX XXXX XXXX XXXX'
    1D81 E7E740E7E7E7E740      1347
    1D89 E7E7E7E740E7E7E7      1347
    1D91 E7                     1347
    1D92 FF                1D92 1348          DC     XL1'FF'              END OF PRINT LINE
```



```
FC21      3340 IPL FORMAT PROGRAM        --MODEL 12

ERR LOC OBJECT CODE       ADDR STMT SOURCE STATEMENT
                                1350 *               SENSE SUBROUTINE
                                1351
                                1352 *               LINKAGE
                                1353
                                1354 *        B      SENSE               CALL
                                1355 *        DC     XL1'0'              1/2 N BYTE, BITS 4-7
                                1356
    1D93 34 08 1DAA             1357 SENSE  ST     SNSMOV+5,ARR        STORE PARAMETER POINTER
    1D97 36 08 1BED             1358          A      ONE,ARR             SET RETURN ADDRESS
    1D9B 34 08 1DBD             1359          ST     SNSEXT+3,ARR        STORE RETURN ADDRESS
    1D9F 0C 00 1DB7 1BF2        1360          MVC    SNS+1(1),MODBIT     SETUP FOR SENSE COMMAND TO DRIVE X
    1DA5 08 03 1DB7 0000        1361 SNSMOV MNN    SNS+1,*-*           TRANSFER 1/2 Q BYTE TO SENSE OP.
    1DAB 38 08 1BF2             1362          TBN    MODBIT,X'08'        DRIVE 2 OR 4?
    1DAF F2 90 04               1363          JF     *+7
    1DB2 3A 08 1DB7             1364          SBN    SNS+1,X'08'         SET FOR 2 OR 4
    1DB6 30 C0 1DC8             1365 SNS    SNS    STATUS,X'C0'        SENSE OP
    1DBA C0 87 0000             1366 SNSEXT B      *-*                 EXIT
                                1367
    1DBE 010001002F        1DC2 1368 RKDN   DC     XL5'010001002F'     R1,K=0,D=256,N=47
    1DC3 FFFF              1DC4 1369 NEG1   DC     XL2'FFFF'
    1DC5 0004              1DC6 1370 FOUR   DC     XL2'04'
    1DC7 0000              1DC8 1371 STATUS DC     XL2'0'              SENSE AREA
    1DC9 2800              1DCA 1372 DFDR   DC     AL2(BUFFER)         DATA AREA ADDRESS
    1DCB 0000              1DCC 1373 DFCR   DC     AL2(*-*)            CONTROL FIELD ADDRESS
    1DCD 00                1DCD 1374 WDFCF  DC     XL1'0'              FLAG
    1DCE 0000              1DCF 1375          DC     XL2'0'              CYLINDER       0000 - 00CB
    1DD0 0002              1DD1 1376          DC     XL2'0002'           HEAD           0000 - 0013
    1DD2 00                1DD2 1377          DC     XL1'0'              RECORD NUMBER    00 - FF
    1DD3 00                1DD3 1378          DC     XL1'0'              KEY LENGTH       00 - FF
    1DD4 0000              1DD5 1379          DC     XL2'0'              DATA LENGTH    0000 - 00FF
    1DD6 00                1DD6 1380          DC     XL1'0'              NUMBER OF RECORDS, 00-FF
                                1381 *                             NOTE. KEY LENGTH + DATA LENGTH MUST NOT
                                1382 *                                   BE GREATER THAN 00FF
                           1DD7 1383 RDFCF  EQU    *
    1DD7 0000000000000000 1DE0 1384          DC     XL10'0'             READ HOME ADDRESS AREA
    1DDF 0000                   1384
```

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1386 *            THIS SUBROUTINE WILL CONVERT ONE BYTE OF
                         1387 *            HEX DATA TO ONE BYTE OF HEXADECEMAL DATA
                         1388
  1DE1 36 08 1BED        1389 CVD    A     ONE,ARR             ADD 1 TO GET 1ST PARAMETER
  1DE5 34 08 1E02        1390        ST    FROM+5,ARR          INSERT THE FROM ADDRESS
  1DE9 36 08 1BEF        1391        A     TWO,ARR             ADD 2 TO GET THE 2ND PARAMETER
  1DED 34 08 1E08        1392        ST    TYBOT+5,ARR         INSERT THE TO ADDR.
  1DF1 34 08 1E0E        1393        ST    OTORZ+5,ARR
  1DF5 36 08 1BED        1394        A     ONE,ARR             ADD 1 TO GET RETURN ADDRESS
  1DF9 34 08 1E31        1395        ST    TIXE+3,ARR
  1DFD 0C 01 1E14 0000   1396 FRCM   MVC   FROBYT+5(2),*-*
  1E03 0C 01 1E27 0000   1397 TYBOT  MVC   TOBYT+3(2),*-*
  1E09 0C 01 1E18 0000   1398 OTORZ  MVC   ZROTO+3(2),*-*
  1E0F 0C 00 1E32 0000   1399 FRCBYT MVC   HXBYT(1),*-*      PUT BYTE IN WORK AREA
  1E15 04 20 0000 1E33   1400 ZROTO  ZAZ   *-*(3),UNITS(1)   ZERO THE TO AREA
  1E1B 0F 00 1E32 1BED   1401 DECGAN SLC   HXBYT(1),ONE      DECREMENT THE HEX BYTE
  1E21 F2 82 0A          1402        JL    TIXE              EXIT IF BELOW 1
  1E24 06 10 0000 1E38   1403 TOBYT  AZ    *-*(2),DECONE(1)  INCREMENT THE DECEMAL COUNT
  1E2A C0 87 1E1B        1404        B     DECGAN
  1E2E C0 87 0000        1405 TIXE   B     *-*               EXIT
                         1406
  1E32 00             1E32 1407 HXBYT  DC    XL1'0'
  1E33 F0             1E33 1408 UNITS  DC    CL1'0'
  1E34 F0F0F0F0F1     1E38 1409 DECONE DC    CL5'00001'
```


FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1411 *            SENSE DECODE SUBROUTINE
                         1412
                         1413 *      LINKAGE
                         1414
                         1415 *      B     PRTSNS              CALL
                         1416 *      DC    XL1'0'              2 BYTES TO SENSE & TEST
                         1417 *      DC    XL2'0'              EXPECTED SENSE BITS
                         1418
  1E39 34 08 1F43        1419 PRTSNS ST    SENEXT+3,ARR        SAVE RETURN ADDRESS
  1E3D 35 01 1F43        1420        L     SENEXT+3,XR1        SET XR2 AS A PARMETER POINTER
  1E41 1C 00 1E56 C0     1421        MVC   SNSPRM(1),0(,XR1)   MOVE BYTE NO. TO USE
  1E46 1C 01 1F49 02     1422        MVC   EXPSNS(2),2(,XR1)   MOVE EXPECTED SENSE BIT MASK.
                         1423
  1E4B C2 02 1E56        1424        LA    SNSPRM,XR2          LOAD XR2 AS POINTER TO SENSE PARM.
  1E4F BB 80 00          1425        SBF   0(,XR2),X'80'       TURN OFF HEADING BIT IF ON
  1E52 C0 87 1D93        1426        B     SENSE               TO SENSE SUBROUTINE
  1E56 00             1E56 1427 SNSPRM DC    XL1'0'
  1E57 78 80 00          1428        TBN   0(,XR1),X'80'       TEST FOR HEADING PRINT
  1E5A F2 90 08          1429        JF    FIRST               JUMP IF NO
  1E5D C0 87 021A        1430        B     PRINT               TO PRINT HEADING
  1E61 02             1E61 1431        DC    XL1'02'             FLAG
  1E62 36             1E62 1432        DC    IL1'54'             LENGTH
  1E63 1FCD           1E64 1433        DC    AL2(SNSHED)         MESSAGE ADDRESS
                         1434
  1E65 C2 01 1FCE        1435 FIRST  LA    SNSWD0,XR1          POINT XR1 TO 1ST MESSAGE
  1E69 BD 05 00          1436        CLI   0(,XR2),X'05'       TEST FOR CORRECT DECODE
  1E6C F2 81 03          1437        JE    SETDRV              JUMP IF YES
  1E6F F0 00 00          1438        HPL   0,0
                      1E72 1439 SETDRV EQU   *
  1E72 3B 86 1DC8        1440        SBF   STATUS-X'86'        RESET UNUSED BITS(0,5,6)
  1E76 0C 01 1ECB 1F45   1441 SETSNS MVC   TSTRCV+3(2),RCVDAD  SET ADDRESS FOR RECEIVED.
  1E7C 0C 01 1EDB 1F47   1442        MVC   TSTEXP+3(2),EXPSAD  SET ADDRESS FOR EXPECTED.
  1E82 C2 02 1F4A        1443 SETMSK LA    TSTMSK,XR2          SET XR2 AS TEST POINTER.
  1E86 2C 00 1EC9 00     1444        MVC   TSTRCV+1(1),0(,XR2) SET MASK FOR RECEIVED TEST
  1E8B 2C 00 1ED9 00     1445        MVC   TSTEXP+1(1),0(,XR2) SET MASK FOR EXPECTED TEST
  1E90 3C 40 1F87        1446        MVI   RCVMSG,C' '         BLANK
  1E94 0C 34 1F86 1F87   1447        MVC   RCVMSG-1(53),RCVMSG PRINT AREA
  1E9A 3C 00 1F8E        1448        MVI   REMEXP,0            RESET
  1E9E 3C 00 1F8F        1449        MVI   REMRCV,0            REMEMBER BITS
  1EA2 7D 00 00          1450        CLI   0(,XR1),0           TEST FOR ZERO ENTRY
  1EA5 F2 81 63          1451        JE    STEP+3              JUMP IF YES
  1EA8 1C 00 1ED0 00     1452        MVC   RCVMVC+1(1),0(,XR1)  SET MESSAGE LENGTH
  1EAD 1C 00 1EE0 00     1453        MVC   EXPMVC+1(1),0(,XR1) SET MESSAGE LENGTH
  1EB2 1C 00 1EE3 00     1454        MVC   EXPMVC+4(1),0(,XR1) SET MESSAGE OFFSET
  1EB7 0E 00 1EE3 1BED   1455        ALC   EXPMVC+4(1),ONE     INCREASE OFFSET BY 1
  1EBD 0C 00 1ED3 1EE3   1456        MVC   RCVMVC+4(1),EXPMVC+4 SET MESSAGE OFFSET
  1EC3 1C 00 1F0A 00     1457        MVC   STEP+2(1),0(,XR1)   SET INCREMENT VALUE
  1EC8 38 00 0000        1458 TSTRCV TBN   *-*,*-*            TEST A RECEIVED SENSE BIT
  1ECC F2 90 09          1459        JF    TSTEXP              JUMP IF OFF
  1ECF 1C 18 1F87 00     1460 RCVMVC MVC   RCVMSG(25),0(,XR1)  PUT MESSAGE IN RCVD. AREA
  1ED4 3C FF 1F8F        1461        MVI   REMRCV,X'FF'        SET REMEMBER RECVD.
  1ED8 38 C0 0000        1462 TSTEXP TBN   *-*,*-*            TEST AN EXPECTED SENSE BIT
  1EDC F2 90 09          1463        JF    *+12                JUMP IF OFF
  1EDF 1C 18 1F6E 00     1464 EXPMVC MVC   EXPMSG(25),0(,XR1)  PUT MESSAGE IN EXPECTED AREA.
  1EE4 3C FF 1F8E        1465        MVI   REMEXP,X'FF'        SET REMEMBER EXPECTED.
  1EE8 0D 00 1F8E 1F8F   1466        CLC   REMEXP(1),REMRCV    COMPARE RCV'D & EXPECTED
  1EEE F2 81 06          1467        JE    *+9                 JUMP IF EQUAL
  1EF1 0C 01 1F54 1F89   1468        MVC   ERMAG-1(2),TWOASK   NOT EQUAL SO INSERT **
  1EF7 0D 01 1F8F 1F95   1469        CLC   REMRCV(2),ZERO      TEST FOR NEITHER ON
  1EFD F2 81 08          1470        JE    STEP                JUMP IF SO
                         1471
  1FC0 C0 87 021A        1472        B     PRINT               TO PRINT ONE LINE
  1F04 01             1F04 1473        DC    XL1'01'             FLAGS
  1F05 36             1F05 1474        DC    IL1'54'             LENGTH
  1F06 1F87           1F07 1475        DC    AL2(RCVMSG)         MESSAGE ADDRESS
  1F08 D2 01 19          1476 STEP   LA    25(,XR1),XR1        STEP MESSAGE POINTER
  1F0B D2 01 02          1477        LA    2(,XR1),XR1         INCREASE POINTER BY 2
  1F0E 3D 01 1EC9        1478        CLI   TSTRCV+1,01         TEST FOR COMPLETION OF A BYTE
```

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  1F12 F2 81 07                1479          JE    *+10
  1F15 E2 02 01                1480          LA    1(*XR2),XR2
  1F18 C0 87 1E86              1481          B     SETMSK+4
  1F1C 0D 01 1ECB 1F45         1482          CLC   TSTRCV+3(2),RCVDAD
  1F22 F2 01 10                1483          JNE   LASTSP
  1F25 0E 01 1ECB 1BED         1484          ALC   TSTRCV+3(2),ONE
  1F28 0E 01 1EDB 1BED         1485          ALC   TSTEXP+3(2),ONE
  1F31 C0 87 1E82              1486          B     SETMSK
                               1487
  1F35 C0 87 021A              1488 LASTSP B       PRINT
  1F39 16                 1F39 1489           DC    XL1'16'
  1F3A 0E 01 1F43 1BF1         1490          ALC   SENEXT+3(2),THREE
  1F40 C0 87 0000              1491 SENEXT B       *-*
                               1492
  1F44 1DC7               1F45 1493 RCVDAD DC     AL2(STATUS-1)
  1F46 1F48               1F47 1494 EXPSAD DC     AL2(EXPSNS-1)
  1F48 C000               1F49 1495 EXPSNS DC     XL2'0'
                          1F4A 1496 TSTMSK EQU    *
  1F4A 80402010           1F4D 1497           DC    XL4'80402010'
  1F4E 08040201           1F51 1498           DC    XL4'08040201'
  1F52 00000000           1F55 1499 ERMAG   DC    XL4'0'
  1F56 4040404040404040   1F6E 1500 EXPMSG DC     CL25'
  1F5E 4040404040404040                1500
  1F66 4040404040404040                1500
  1F6E 40                              1500
  1F6F 4040404040404040   1F87 1501 RCVMSG DC     CL25'
  1F77 4040404040404040                1501
  1F7F 404C4040404C4040                1501
  1F87 40                              1501
  1F88 5C5C               1F89 1502 TWOASK DC     CL2'**'
  1F8A 0000               1F8B 1503 SEKFLG DC     XL2'00'
  1F8C 2800               1F8D 1504 ABUF   DC     AL2(BUFFER)
  1F8E 00                 1F8E 1505 REMEXP DC     XL1'0'
  1F8F 00                 1F8F 1506 REMRCV DC     XL1'0'
  1F90 0000               1F91 1507           DC    XL2'00'
  1F92 0000               1F93 1508           DC    XL2'00'
  1F94 0000               1F95 1509 ZERO   DC     XL2'0'
  1F96 FFFF               1F97 1510 MINCNE DC     IL2'-1'
  1F98 C5D9D9404040404040 1FBF 1511           DC    CL40'ERR      EXPECTED SENSE                RECEI'
  1FA0 40C5E7D7C5C3E3C5                1511
  1FA8 C440E2C5D5E2C540                1511
  1FB0 4040404040404040                1511
  1FB8 40404CD9C5C3C5C9                1511
  1FC0 E5C5C440E2C5D5E2 1FCD 1512 SNSHED DC     CL14'VED SENSE      '
  1FC8 C540404040404040                1512
  1FCE 12                 1FCE 1513 SNSWDO DC     IL1'18'
  1FCF E4D5C9E340C3C8C5   1FE1 1514           DC    CL19'UNIT CHECK, DRIVE 1'
  1FD7 C3D26B40C4D9C9E5                1514
  1FDF C540F1                          1514
  1FE2 12                 1FE2 1515           DC    IL1'18'
  1FE3 E4D5C9E340C3C8C5   1FF5 1516           DC    CL19'UNIT CHECK, DRIVE 2'
  1FEB C3D26B40C4D5C5E5                1516
  1FF3 C540F2                          1516
  1FF6 12                 1FF6 1517           DC    IL1'18'
  1FF7 E4D5C9E340C3C8C5   2009 1518           DC    CL19'UNIT CHECK, DRIVE 3'
  1FFF C3D26B40C4D9C9E5                1518
  2007 C540F3                          1518
  200A 12                 200A 1519           DC    IL1'18'
  200B E4D5C9E340C3C8C5   201D 1520           DC    CL19'UNIT CHECK, DRIVE 4'
  2013 C3D26B40C4D5C5E5                1520
  201B C540F4                          1520
  201E 15                 201E 1521           DC    IL1'21'
  201F E2C5C5D240C3D6D4   2034 1522           DC    CL22'SEEK COMPLETE, DRIVE 1'
  2027 D7D3C5E3C56B40C4                1522
  202F D9C9E5C540F1                    1522
  2035 15                 2035 1523           DC    IL1'21'
  2036 E2C5C5D240C3D6D4   204B 1524           DC    CL22'SEEK COMPLETE, DRIVE 2'
  203E D7D3C5E3C56B40C4                1524
```

JUMP IF FINISHED WITH ONE BYTE.
NOT FINISHED. STEP MASK POINTER
TEST THE NEXT BIT
TEST FOR BOTH BYTES TESTED
JUMP TO EXIT ROUTINE IF YES.
INCREMENT RECEIVED ADDRESS
INCREMENT EXPECTED ADDRESS
TEST NEXT BYTE

TO SPACE ONLY

STEP EXIT ADDRESS
EXIT

*REQUIRED TO MAKE ZERO 6 BYTES
**

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```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

  2046 D9C9E5C540F2                  1524
  204C 15                 204C 1525           DC    IL1'21'
  204D E2C5C5D240C3D6D4   2062 1526           DC    CL22'SEEK COMPLETE, DRIVE 3'
  205E D7D3C5E3C56B40C4                1526
  205D D9C9E5C540F3                    1526
  2063 15                 2063 1527           DC    IL1'21'
  2064 E2C5C5D240C3D6D4   2079 1528           DC    CL22'SEEK COMPLETE, DRIVE 4'
  206C D7D3C5E3C56B40C4                1528
  2074 D9C9E5C540F4                    1528
                                       1529
  207A 0000               207B 1530           DC    XL2'00'
  207C 09                 207C 1531           DC    IL1'09'
  207D E2C3C1D540C5D8E4   2086 1532           DC    CL10'SCAN EQUAL'
  2085 C1D3                            1532
  2087 15                 2087 1533           DC    IL1'21'
  2088 D7D9D6C7D9C1D440   209D 1534           DC    CL22'PROGRAM LOAD-REMOVABLE'
  2090 D3D6C1C460D9C5D4                1534
  2098 D6E5C1C2D3C5                    1534
  209E 05                 209E 1535           DC    IL1'05'
  209F D6D740C5D5C4       20A4 1536           DC    CL06'OP END'
  20A5 04                 20A5 1537           DC    IL1'04'
  20A6 D5D640D6D7         20AA 1538           DC    CL05'NO OP'
  20AB 0000               20AC 1539           DC    XL2'00'
  20AD 0000               20AE 1540           DC    XL2'00'
  20AF 0C                 20AF 1541           DC    IL1'12'
  20B0 C1C4C1D7E3C5D540   20BC 1542           DC    CL13'ADAPTER CHECK'
  20B8 C3C8C5C3D2                      1542
                                       1543 *
                                       1544 *
                                       1545 *      DISPLAY BUFFERS
                                       1546 *
                                       1547 *
                          208C 1548 DISP1  EQU    *-1
  20BD E3C8C9E240D7D9D6   20E4 1549           DC    CL40'THIS PROGRAM IS USED TO UPDATE CYL 0 WIT'
  20C5 C7D9C1D440C9E240                1549
  20CD E4E2C5C440E3D640                1549
  20D5 E4D7C4C1E3C5E40C3               1549
  20DD E8D340F040E6C9E3                1549
  20E5 C840F3F3F4F040D4   210E 1550 DISP1A DC     CL42'H 3340 MICRO-CODE(ID FA0), 3340 MINI MICRO'
  20ED C9C3D9D660C3D6C4                1550
  20F5 C54DC9C440C6C1F0                1550
  20FD 5D6B40F3F3F4F040                1550
  2105 D4C9D5C940D4C9C3                1550
  210D D9D6                            1550
                          210E 1551 DISP11 EQU    *-1
  210F 40D3D6C1C4C5D94D   2136 1552           DC    CL40' LOADER(ID FA6), AND THE 3340 IPL LOADER'
  2117 C9C440C6C1F65D68                1552
  211F 40C1D5C440E3C8C5                1552
  2127 40F3F3F4F040C9D7                1552
  212F D340D3D6C1C4C5D9                1552
  2137 4DC9C440C6C1F75D   215F 1553 DISP1B DC     CL41'(ID FA7). THESE PROGRAMS RESIDE ON THE CE'
  213F 4B40E3C8C5E2C540                1553
  2147 C7D9D6C7D9C1D4E2                1553
  214F 40D9C5F2C9C4C540                1553
  2157 D6D540E3C8C5E40C3               1553
  215F C5                              1553
                          215F 1554 DISP12 EQU    *-1
  2160 40C4C1E3C140D4D6   2188 1555 DISP1C DC     CL41' DATA MODULE IN TWO LOCATIONS. THESE ARE:'
  2168 C4E4D3C540C9D540                1555
  2170 E3E6D640D3D6C3C1                1555
  2178 E3C9D6D5E24B40E3                1555
  2180 C8C5E2C540C1D9C5                1555
  2188 7A                              1555
                          2188 1556 DISP13 EQU    *-1
  2189 404040F160C3E8D3   21B0 1557 DISP1C DC     CL40'  1-CYLINDER 0 WHICH IS USED FOR IPL   '
  2191 C9D5C4C5D540F040                1557
  2199 E6C8C9C3C840C9E2                1557
  21A1 40E4E2C5C440C6D6                1557
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FC21     3340 IPL FORMAT PROGRAM        --MODEL 12

ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   21A9 D940C9D7D3404040       1557
                        21B0 1558 DISP14 EQU   *-1
   21B1 404040F260D5D6D9 21B8 1559         DC    CL40'   2-NORMAL PROGRAM AREA (USED BY THIS P'
   21B9 D4C1D340D7D9D6C7       1559
   21C1 D9C1D440C1D5C5C1       1559
   21C9 404DE4E2C5C440C2       1559
   21D1 E840E3C8C9E240D7       1559
   21D9 D9D6C7D9C1D440E3 2207  1560         DC    CL47'ROGRAM TO UPDATE CYLINDER 0 UNLESS RUNNING FROM'
   21E1 D640E4D7C4C1E3C5       1560
   21E9 40C3E8D3C5D5C4C5       1560
   21F1 D940F040E4D5D3C5       1560
   21F9 E2E240D9E4D5D5C9       1560
   2201 D5C740C6D9D6D4         1560
   2208 40C1D3E340D3D6C1 2213  1561 DISP1E DC    CL12' ALT LOADER.'
   2210 C4C5D94B               1561
                        2214   1562 EDISP1 EQU   *
                               1563
                               1563
                               1563
                        2213   1564 DISP21 EQU   *-1
   2214 C3C540C4C1E3C140 223B  1565         DC    CL40'CE DATA MODULE RESIDE ON D1. THE DA'
   221C D4D6C4E4D3C540D4       1565
   2224 E4E2E340D9C5E2C9       1565
   222C C4C540D6D540C4F1       1565
   2234 4B40E3C8C540C4C1       1565
   223C E3C140D4D6C4E4D3 2263  1566 DISP2A DC    CL40'TA MODULE TO BE UPDATED MAY RESIDE ON D1'
   2244 C540E3D640C2C540       1566
   224C E4D7C4C1E3C5C440       1566
   2254 D4C1E840D9C5E2C9       1566
   225C C4C540D6D540C4F1       1566
                        2263   1567 DISP22 EQU   *-1
   2264 D6D940C4F24B40C3 228A  1568         DC    CL39'OR D2. CYL 0 IS UPDATED BY FA0. FA6. OR'
   226C E8D340F040C9E240       1568
   2274 E4D7C4C1E3C5C440       1568
   227C C2E840C6C1F06B40       1568
   2284 C6C1F66B40D6D9         1568
   228B 40C6C1F740E6C8C9 2288  1569 DISP2B DC    CL46' FA7 WHICH RESIDES IN THE NORMAL PROGRAM AREA'
   2293 C3C840D9C5E2C9C4       1569
   229B C5E240C9D540E3C8       1569
   22A3 C540D5D6D9D4C1D3       1569
   22AB 40D7D9D6C7D9C1D4       1569
   22B3 40C1D9C5C140           1569
                        2288   1570 DISP23 EQU   *-1
   22B9 4DD6D940C3C1D9C4 22E5  1571         DC    CL45'(OR CARDS OR DISKETTE). NOT CYL 0 FROM CE DA'
   22C1 E240D6D940C4C9E2       1571
   22C9 D2C5E3E3C55D6E40       1571
   22D1 D5D6E340C3E8D340       1571
   22D9 F040C6D9D6D440C3       1571
   22E1 C540C4C140             1571
   22E6 E3C140D4D6C4E4D3 230E  1572 DISP2C DC    CL41'TA MODULE. ENTER D1 OR D2 IN THE CPU DATA'
   22EE C54B40C5D5E3C5D9       1572
   22F6 40C4F140D6D940C4       1572
   22FE F240C9D540E3C8C5       1572
   2306 40C3D7E440C4C1E3       1572
   230E C1                     1572
                        230E   1573 DISP24 EQU   *-1
   230F E2E6C9E3C3C8C5E2 2334  1574         DC    CL38'SWITCHES FOR THE DRIVE WITH THE DATA M'
   2317 40C6D6D940E3C8C5       1574
   231F 40C4D9C9E5C540E6       1574
   2327 C9E3C840E3C8C540       1574
   232F C4C1E3C140D4           1574
   2335 D6C4E4D3C540E3D6 235C  1575 DISP2D DC    CL40'CDULE TO BE UPDATED. NOTE THAT IF D1 IS '
   233D 40C2C540E4D7C4C1       1575
   2345 E3C5C44B40D5D6E3       1575
   234D C540E3C8C1E340C9       1575
   2355 C640C4F140C9E240       1575
                        235C   1576 DISP25 EQU   *-1
   235D E2D7C5C3C9C6C9C5 2385  1577         DC    CL41'SPECIFIED. CYL 0 ON THE CE DATA MODULE WI'
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FC21     3340 IPL FORMAT PROGRAM        --MODEL 12

ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   2365 C46B40C3E8D340F0       1577
   236D 40C6D540E3C8C540       1577
   2375 C3C540C4C1E3C140       1577
   237D D4C6C4E4D3C540E6       1577
   2385 C9                     1577
   2386 D3D340C2C540E4D7 2387  1578 DISP2E DC    CL50'LL BE UPDATED. ENTER THE DRIVE AND RESET THE HALT.'
   238E C4C1E3C5C44B40C5       1578
   2396 D5E3C5D940E3C8C5       1578
   239E 40C4D9C9E5C540C1       1578
   23A6 D5C440D9C5E2C5E3       1578
   23AE 40E3C8C540C8C1D3       1578
   23B6 E34B                   1578
                        23B8   1579 EDISP2 EQU   *
                               1580
                               1580
                               1580
                        23B7   1581 DISP31 EQU   *-1
   23B8 C5D5E3C5D940E3C8 23DF  1582         DC    CL40'ENTER THE IDS(FA0, FA6, FA7) OF THE PROG'
   23C0 C540C9C4E24DC6C1       1582
   23C8 F06B40C6C1F66B40       1582
   23D0 C6C1F75D40D6C640       1582
   23D8 E3C8C540D7D9D6C7       1582
   23E0 D9C1D4E240E3D640 2407  1583 DISP3A DC    CL40'RAMS TO BE UPDATED THROUGH THE CPU DATA '
   23E8 C2C540E4D7C4C1E3       1583
   23F0 C5C440E3C8D9D6E4       1583
   23F8 C7C840E3C8C540C3       1583
   2400 D7F440C4C1E3C140       1583
                        2407   1584 DISP32 EQU   *-1
   2408 E2E6C9E3C3C8C5E2 242F  1585         DC    CL40'SWITCHES. ONE OR MORE PROGRAMS MAY BE EN'
   2410 4B40D6D5C540D6D9       1585
   2418 40D4D6D9C540D7D5       1585
   2420 D6C7D9C1D4E240D4       1585
   2428 C1E840C2C540C5D5       1585
   2430 E3C5D9C5C440E3C8 2458  1586 DISP3B DC    CL41'TERED THROUGH THE DATA SWITCHES. WHEN THE'
   2438 D9D6E4C7C840E3C8       1586
   2440 C540C4C1E3C140E2       1586
   2448 E6C9E3C3C8C5E24B       1586
   2450 40E6C8C5D54CE3C8       1586
   2458 C5                     1586
                        2458   1587 DISP33 EQU   *-1
   2459 C5D5E3D9E840D6D9 247E  1588         DC    CL38'ENTRY OR ENTRIES HAVE BEEN COMPLETED E'
   2461 40C5D5E3D9C9C5E2       1588
   2469 40C8C1E5C540C2C5       1588
   2471 C5D540C3D6D4D7D3       1588
   2479 C5E3C5C440C5           1588
   247F D5E3C5D940F0C6C6 24A7  1589 DISP3C DC    CL41'NTER OFFF IN THE DATA SWITCHES TO SIGNIFY'
   2487 C640C9D540E3C8C5       1589
   248F 40C4C1E3C140E2E6       1589
   2497 C9E3C3C8C5E240E3       1589
   249F D640E2C9C7DEC9C6       1589
   24A7 E8                     1589
                        24A7   1590 DISP34 EQU   *-1
   24A8 C3D6D4D7D3C5E3C9 24CF  1591         DC    CL40'COMPLETION. NOTE THAT IF FA0 IS SELECTED'
   24B0 D6D54B40D5D6E3C5       1591
   24B8 40E3C8C1E340C9C6       1591
   24C0 40C6C1F040C9E240       1591
   24C8 E2C5D3C5C3E3C5C4       1591
   24D0 6B40D7D9D6C7D9C1 24FB  1592 DISP3D DC    CL44', PROGRAM C17 IS USED IN THE UPDATE PROCESS.'
   24D8 D440C3F1F740C9E2       1592
   24E0 40E4E2C5C440C5D5       1592
   24E8 40E3C8C540E4C7C4       1592
   24F0 C1E3C540D7D9D6C3       1592
   24F8 C5E2E24B               1592
                        24FB   1593 DISP35 EQU   *-1
   24FC E6C8C5D540D9E4D5 2528  1594         DC    CL45'WHEN RUNNING FROM ALT LOADER. CONTROL STORE W'
   2504 C5C9D5C740C6D9D6       1594
   250C D440C1D3E340D3D6       1594
   2514 C1C4C5D96B40C3D6       1594
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ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

   251C D5E3D9D6D340E2E3       1594
   2524 D6D9C540E6             1594
   2529 C9D3D340C2C540D3 2551  1595 DISP3E DC    CL41'ILL BE LOADED IN ADDITION TO THE UPDATING'
   2531 D6C1C4C5C440C9D5       1595
   2539 40C1C4C4C9E3C9D6       1595
   2541 C540E3D640E3C8C5       1595
   2549 40E4D7C4C1E3C9D5       1595
   2551 C7                     1595
                         2551  1596 DISP3F EQU   *-1
   2552 D6C640C6C1F04B40 257A  1597 DISP3F DC    CL41'OF FA0. ENTER THE IDS AND RESET THE HALT.'
   255A C5D5E3C5D940E3C8       1597
   2562 C540C9C4E240C1D5       1597
   256A C440D9C5E2C5E340       1597
   2572 E3C8C540C8C1D3E3       1597
   257A 4B                     1597
                         257B  1598 EDISP3 EQU   *
                               1599
                               1599
                         257A  1600 DISP4  EQU   *-1
   257B E3C8C540C6D6D3D3 25A2  1601         DC    CL40'THE FOLLOWING PROGRAMS WILL BE UPDATED. '
   2583 D6E6C9D5C740D7D9       1601
   2588 D6C7D9C1D4E240E6       1601
   2593 C9D3D340C2C540E4       1601
   259E C7C4C1E3C5C44B40       1601
   25A3 E5C5D9C9C6E840E3 25CA  1602 DISP4A DC    CL40'VERIFY THAT THE EC LEVELS ARE CORRECT.  '
   25AB C8C1E340E3C8C540       1602
   25B3 C5C340D3C5E5C5D3       1602
   25BB E240C1D9C540C3D6       1602
   25C3 D9D9C5C3E34B4040       1602
                         25CA  1603 DISP41 EQU   *-1
   25CB D9C5E2C5E340E3C8 25F2  1604 DISP4B DC    CL40'RESET THE HALT SO UPDATES MAY BE DONE.  '
   25D3 C540C8C1D3E340E2       1604
   25DB D640E4D7C4C1E3C5       1604
   25E3 E240D4C1E840C2C5       1604
   25EB 40C4D6D5C54E4040       1604
                         25F2  1605 DISP42 EQU   *-1
   25F3 40C5C4404040D6D3 261A  1606 DISP4C DC    CL40' ID   OLC EC   NEW EC                '
   25FB C440C5C340404040D5     1606
   2603 C5E64CC5C34C4040       1606
   260B 4040404040404040       1606
   2613 4040404040404040       1606
                         261A  1607 DISP43 EQU   *-1
   261B 4040404040404040 2642  1608 DISP4D DC    CL40'
   2623 4040404040404040       1608
   262B 4040404040404040       1608
   2633 4040404040404040       1608
   263B 4040404040404040       1608
                         2642  1609 DISP44 EQU   *-1
   2643 4040404040404040 266A  1610 DISP4E DC    CL40'
   264B 4040404040404040       1610
   2653 4040404040404040       1610
   265B 4040404040404040       1610
   2663 4040404040404040       1610
                         266A  1611 DISP45 EQU   *-1
   266B 4040404040404040 2692  1612 DISP4F DC    CL40'
   2673 4040404040404040       1612
   267B 4040404040404040       1612
   2683 4040404040404040       1612
   268B 4040404040404040       1612
                         2693  1613 EDISP4 EQU   *
```


FC21 3340 IPL FORMAT PROGRAM --MODEL 12

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                               1615 *        DCPE
                               1616
                               1616
                               1617 ***********************************
                               1618 *       STANDARD DCP EQUATES      *
                               1619 ***********************************
                         0222  1620 HALT   EQU   X'222'
                         0216  1621 LINK   EQU   X'216'
                         021A  1622 PRINT  EQU   X'21A'
                         0212  1623 TEST   EQU   X'212'
                         021E  1624 UNPACK EQU   X'21E'
                         0020  1625 PIAR   EQU   X'20'                  PROGRAM INSTRUCTION ADDRESS REGI
                         0004  1626 PSR    EQU   X'04'
                         0001  1627 XR1    EQU   01
                         0002  1628 XR2    EQU   02
                         0008  1629 ARR    EQU   X'08'
                         00C0  1630 IAR1   EQU   X'C0'
                         0084  1631 IAR5   EQU   X'84'
                         0020  1632 PIIAR  EQU   X'20'
                         0200  1633 SYSTEM EQU   512
                         0226  1634 PACK   EQU   X'226'
                         022A  1635 LOAC   EQU   X'22A'
                         0080  1636 BIT0   EQU   X'80'
                         0040  1637 BIT1   EQU   X'40'
                         0020  1638 BIT2   EQU   X'20'
                         0010  1639 BIT3   EQU   X'10'
                         0008  1640 BIT4   EQU   X'08'
                         0004  1641 BIT5   EQU   X'04'
                         0002  1642 BIT6   EQU   X'02'
                         0001  1643 BIT7   EQU   X'01'
                         0208  1644 SBYTE0 EQU   X'0208'
                         020A  1645 SBYTE2 EQU   X'020A'                 SENSE SWITCH BYTE 2
                         020B  1646 SBYTE3 EQU   X'020B'                 SENSE SWITCH BYTE 3
                         0020  1647 SSW02  EQU   X'20'                  MANUAL INTERVENTION
                         0008  1648 SSW04  EQU   X'08'                  BYPASS NON-ERROR PRINTING (DCP)
                         0001  1649 SSW07  EQU   X'01'                  LOAD AND GO (DCP)
                         0080  1650 SSW10  EQU   X'80'
                         0040  1651 SSW11  EQU   X'40'
                         0020  1652 SSW12  EQU   X'20'
                         0010  1653 SSW13  EQU   X'10'
                         0008  1654 SSW14  EQU   X'08'
                         0004  1655 SSW15  EQU   X'04'
                         0002  1656 SSW16  EQU   X'02'
                         0001  1657 SSW17  EQU   X'01'
                         0080  1658 SSW18  EQU   X'80'
                         0040  1659 SSW19  EQU   X'40'
                         0020  1660 SSW1A  EQU   X'20'
                         0001  1661 SSW2F  EQU   X'01'
                               1662
                         0879  1663 CRTFLG EQU   X'0879'                 FLAG BYTE TO INDICATE MICROCODE
                         0000  1664 L1     EQU   00
                         0028  1665 L2     EQU   40
                         0050  1666 L3     EQU   80
                         0078  1667 L4     EQU   120
                         00A0  1668 L5     EQU   160
                         00C8  1669 L6     EQU   200
                         00F0  1670 L7     EQU   240
                         0118  1671 L8     EQU   280
                         0140  1672 L9     EQU   320
                         0168  1673 L10    EQU   360
                         0190  1674 L11    EQU   400
                         01B8  1675 L12    EQU   440
                               1676
                               1677 *** END OF EXPANSION **
```

```
ERR LOC OBJECT CODE      ADDR STMT SOURCE STATEMENT

                         1679 *
                         1680 *
                         1681 *        WRITE BUFFER      **********
                         1682 *
                         1683 *
   2800                  1684          ORG   X'2800'
                    2800 1685 BUFFER EQU   *
   2800                  1686          DS    5CL256
                    2D00 1687 EBUF   EQU   *
                    0000 1688          END   FC2
```



```
SYMBOL  T LEN VALUE  DEFN  REFERENCES

ABFR47  A 002 168F   1001  0275  0853  0884
ABUF    A 002 1F8D   1504  0394  0733
ACT     A 003 18CB   1048
ADIAG   A 002 1D3E   1343  0505  1305
ALTADR  A 002 17C5   1033  0522  0773  0795
AMDPID  A 002 0A1E   0022
ARR     C 001 0008   1625  0920  0951  1079  1102  1147  1204  1227  1228* 1229  1243  1244* 1245
                           1257  1258* 1259  1357  1358* 1359  1389* 1390  1391* 1392  1393  1394*
                           1395  1419
ATHBSY  A 004 1C45   1243  1104
ATHEXT  A 004 1C55   1247  1243*
ATTBSY  A 004 1AE6   1102  0280  0395  0510  0535  0746  0756  0778  0800  0812  0824  0858  0897
                           1108  1310
AC8     A 001 1845   1132  1127
A19     A 004 1B4A   1134
A27     A 014 1B5A   1136  1126
BIT0    C 001 0080   1636
BIT1    C 001 0040   1637
BIT2    C 001 0020   1638
BIT3    C 001 0010   1639
BIT4    C 001 0008   1640
BIT5    C 001 0004   1641
BIT6    C 001 0002   1642
BIT7    C 001 0001   1643
BUFER6  C 001 2A94   1067  0727* 0728* 0729*
BUFFA0  C 001 3C00   1070  0819  0819* 1017  1018
BUFFA6  C 001 3294   1069  0454  0727  0728  0729
BUFFA7  C 001 3000   1068  0719  0720
BUFFER  A 001 2800   1685  0719* 0720* 0987  1372  1504
BUFF10  A 002 16AF   1017  0049* 0807
BUFF20  A 002 1681   1018  0050* 0818
BUFR47  A 001 146E   0993  0288  0317* 0318  0318* 0864  0880* 0881  0881* 1001
CAL12   A 001 103E   0612  0553
CARREQ  C 001 2A20   1071  0722*
CARSAV  A 001 16C3   1030  0513* 0517* 0653* 0676  0722
CKAGN   A 005 0BF2   0213  0256
CKCOMA  A 004 0B81   0180  0166
CKDR#   A 005 0ABE   0102  0106
CKER    A 002 17D8   1043  0655
CKFA0   A 005 0DA4   0382  0357  0359  0916
CKIDS   A 005 0B5D   0165  0169
CKIDS1  A 004 0B55   0163  0146* 0189*
CKNXT   A 003 0C6A   0251  0222  0230  0245
CKPRT   A 003 1137   0704  0701
CKXX    A 003 1300   0866  0879
CK00    A 003 0CC7   0290  0316
CLW     A 002 17CB   1036  0575* 0582
CL3     A 002 17C7   1034  0555* 0558  0614* 0617
CMPRES  A 004 1392   0920  0450
CMPRTN  A 004 13FA   0947  0920*
CMP00   A 003 139E   0923  0928
CMP01   A 003 13A7   0926  0924
CMP02   A 004 13C0   0933  0945
CNTUE   A 001 0C7D   0261  0253  0255
CCM     A 001 0A19   0019  0479  0485*
COMPUT  A 004 13FE   0951  0455
COMP00  A 006 140C   0954  0557
COMP01  A 006 141D   0958  0955
COMRTN  A 004 142F   0962  0951*
COUNT   A 002 144C   0977  0284* 0315* 0557* 0559* 0567* 0572* 0575  0581* 0587* 0591  0596* 0599*
                           0616* 0618* 0623* 0628* 0631  0862* 0878* 0922* 0927* 0931* 0944* 0953*
                           0958* 0959  0960  0961
CPW     A 002 17CF   1038  0591* 0632* 0653  0655
CRTFLG  C 001 0879   1663
CVD     A 004 1DE1   1385
C3      A 003 1BA8   1170  1161
```

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
C4	A	004	18C9	1180	1171
DDCF	A	001	144F	0979	0270 0279 0387 0398 0737 0745 0755 0848 0857 0888 0896
DDDF	A	002	145A	0987	
DECGAN	A	006	1E1E	1401	1404
DECONE	A	005	1E38	1409	1403
DEC1	A	004	1440	0968	044E
DEVERR	A	004	1C59	1257	0272 0281 0389 04C0 0528 0536 0739 0747 0757 0770 0779 0792
					0801 0813 0825 0850 0859 0890 0898
DEVEXT	A	004	1C6C	1262	1259* 1265
DFCR	A	002	1DCC	1373	1209* 1214
DFDR	A	002	1DCA	1372	0275* 0394* 0505* 0522* 0733* 0773* 0795* 0807* 0818* 0853* 0884* 1215
					1305*
DIAG	A	001	1D25	1341	0515 0552 1315 1343
DISPER	A	004	0B6F	0173	
DISP1	A	001	20EC	1548	0053
DISP1A	A	042	210E	1550	0053 0054
DISP1B	A	041	215F	1553	0057 0058
DISP1C	A	041	2188	1555	0061 0062
DISP1D	A	040	21B0	1557	0065 0066
DISP1E	A	012	2213	1561	0069 0070
DISP11	A	001	210E	1551	0057
DISP12	A	001	215F	1554	0061
DISP13	A	001	2188	1556	0065
DISP14	A	001	21B0	1558	0069
DISP2A	A	040	2263	1566	0073 0074
DISP2B	A	046	2288	1569	0077 0078
DISP2C	A	041	230E	1572	0081 0082
DISP2D	A	040	235C	1575	0085 0086
DISP2E	A	050	2387	1578	0089 0090
DISP21	A	001	2213	1564	0073
DISP22	A	001	2263	1567	0077
DISP23	A	001	2288	1570	0081
DISP24	A	001	230E	1573	0085
DISP25	A	001	235C	1576	0089
DISP3A	A	040	2407	1583	0120 0121
DISP3B	A	041	2458	1586	0124 0125
DISP3C	A	041	24A7	1589	0128 0129
DISP3D	A	044	24FB	1592	0132 0133
DISP3E	A	041	2551	1595	0136 0137
DISP3F	A	041	257A	1597	0140 0141
DISP31	A	001	2387	1581	0120
DISP32	A	001	2407	1584	0124
DISP33	A	001	245E	1587	0128
DISP34	A	001	24A7	1590	0132
DISP35	A	001	24FB	1593	0136
DISP36	A	001	2551	1596	0140
DISP4	A	001	257A	1600	0204* 0205 0205* 0285 0324
DISP4A	A	040	25CA	1602	0324 0325
DISP4B	A	040	25F2	1604	0328 0329
DISP4C	A	040	261A	1606	0332 0333
DISP4D	A	040	2642	1608	0336 0337
DISP4E	A	040	266A	1610	0340 0341
DISP4F	A	040	2692	1612	0344 0345
DISP41	A	001	25CA	1603	0328
DISP42	A	001	25F2	1605	0332
DISP43	A	001	261A	1607	0336
DISP44	A	001	2642	1609	0340
DISP45	A	001	266A	1611	0344
DIV02	A	006	0FFE	0586	0584 0589
DIV12	A	006	0FC4	0571	0569 0574
DOALT	A	004	1222	0787	0783
DOFA0	A	001	0E98	0463	0383
DOFA6	A	001	0E26	0428	0405
DOLOOP	A	004	0F6C	0546	0716
DONE	A	001	12A4	0831	0760 0827
DONE1	A	004	12B7	0838	0835

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
DOPACK	A	006	0B8B	0196	0159
DOWRT	A	004	118E	0731	0724
DRID	A	001	0BC5	0198	0196*
DRIVE#	A	002	146B	0991	0097* 0102 0196
DRIVES	A	001	16A2	1007	0101
DSKEXT	A	004	18E7	1187	1147* 1149 1150* 1186*
DSPUPT	A	004	137D	0908	0901
DV02	A	006	1076	0627	0625 0630
EATT	A	004	1830	1121	1102* 1105
EBSY	A	004	1AE2	1098	1079* 1082
EPUF	A	001	2D00	1687	
EC	A	003	1A8F	1063	0229
EDISP1	A	001	2214	1562	
EDISP2	A	001	2388	1579	
EDISP3	A	001	257B	1598	
EDISP4	A	001	2693	1613	
ELEVEN	A	002	146D	0992	
ENDFA7	C	001	3293	1073	0721
ERMAG	A	004	1F55	1499	1468*
ERRCTR	A	001	1B35	1123	
ERROR	A	011	1465	0988	0110 0176
ER6255	A	026	1AE1	1097	1090
ER6275	A	024	1B2F	1119	1112
EXPMSG	A	025	1F6E	1500	1464*
EXPMVC	A	005	1EDF	1464	1453* 1454* 1455* 1456
EXPSAD	A	002	1F47	1494	1442
EXPSNS	A	002	1F49	1495	1422* 1454
FA0	A	002	16A6	1012	0213 0358 0382
FA0ID	A	002	0A20	0023	
FA6	A	002	16A8	1013	0215 0404
FA7	A	002	16AA	1014	0500
FC2	A	001	0000	0005	1688
FF	C	001	00FF	0973	0151 0180 0186
FFF	A	002	1448	0972	0158
FIRST	A	004	1E65	1435	1429
FIVE	A	002	16AD	1016	
FORM01	A	006	0E57	0446	0444 0457
FORM02	A	006	0E80	0456	0461
FORTY	A	002	1469	0990	
FOR80	A	002	1467	0989	
FOUR	A	002	1DC6	1370	1186 1228 1244 125E
FROBYT	A	006	1E0F	1399	1396*
FROM	A	006	1DFD	1396	1390*
FROM1	A	002	1CFB	1324	1320*
GO	A	004	0A5A	0051	0046
GWRITE	A	004	0EE8	0494	0489
HALT	C	001	0222	1620	0091 0111 0152 0177 0190 0237 0346 0373 0414 0436 0476 1093
					1115 1226 1300 1333
HARREQ	C	001	2A22	1072	0723*
HARSAV	A	001	16C2	1029	0514* 0518* 0654* 0658* 0660* 0661* 0665* 0691 0723
HDFA0	A	004	0C4D	0241	0214
HDFA6	A	004	0C5D	0247	0216
HDFA7	A	004	0C02	0217	
HDRFA0	A	001	156E	0955	0201* 0244* 0287 0490* 0863
HDRFA6	A	001	15CE	0997	0202* 0250* 0445*
HDRFA7	A	001	162E	0999	0203* 0221* 0224* 0225* 0226* 0227* 0228* 0229* 0422*
HERE	A	004	10BD	0658	0656
HERE1	A	004	10D5	0665	0663
HH	A	002	16B6	1021	0806*
HLW	A	002	17CD	1037	0576* 0604
HL3	A	002	17C9	1035	0556* 0562 0563 0615* 0624 0627* 0629 0638
HPW	A	002	17D1	1039	0597* 0598* 0604* 0637* 0640* 0660 0662
HXBYT	A	001	1E32	1407	1399* 1401*
IAR1	C	001	00C0	1630	
IAR5	C	001	0084	1631	
ICYL	A	004	112D	0702	0699

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
IDS	A	001	16A5	1011	0164
IDSEQ	A	004	143C	0967	0442* 0446* 0449
INREC	C	001	0880	0976	0221 0244 0250 0422 0442 0445 0449 0451 0453 0456* 0921 0929 0946* 0952* 0954* 0958
IO	A	002	1442	0969	0953
I1	A	002	1444	0970	0927 0944 0954
I3	A	002	1446	0971	0456
I384	A	002	1434	0963	0956
LASTSP	A	034	1F35	1488	1483
LCTRL	A	004	1C23	1214	1152* 1163* 1173* 1181*
LDATA	A	004	1C27	1215	1154* 1165* 1175* 1183*
LDRID	A	002	0A1C	0021	
LFA0	A	006	0EB7	0479	0465
LFA6	A	004	0E3D	0439	0430
LFA7	A	004	0E07	0417	0408
LINK	C	001	0216	1621	
LOAD	C	001	022A	1635	0218 0241 0247 0417 0423 0439 0447 0480 0902 0912
L1	C	001	0000	1664	
L10	C	001	0168	1673	
L11	C	001	0190	1674	
L12	C	001	0188	1675	
L2	C	001	0028	1665	
L3	C	001	0050	1666	
L4	C	001	0078	1667	
L5	C	001	00A0	1668	
L6	C	001	00C8	1669	
L7	C	001	00F0	1670	
L8	C	001	0118	1671	
L9	C	001	0140	1672	
MGFA7	A	039	1967	1053	0412
MGNOTE	A	040	1A0E	1057	0363
MG1	A	041	1A69	1060	0368
MG2	A	032	1A89	1061	0372
MINONE	A	002	1F97	1510	
MODBIT	A	001	18F2	1191	1151* 1162* 1172* 1180* 1205 1211 1360 1362
MOD1	A	006	1286	0819	0047* 0048*
MSGADP	A	013	1D48	1345	1281
MSGC17	A	038	19E6	1056	0475
MSGFA0	A	050	19C0	1055	0470
MSGFA6	A	039	198E	1054	0434
MSGFA7	A	038	1902	1050	0235
MSGSNS	A	045	1D78	1346	1316
MSGSN1	A	025	1D91	1347	1331
MSGW	A	004	1854	1046	0547
MSGWP	A	001	18C8	1047	0715
MSG3	A	004	17DC	1044	0546
MSG3P	A	001	1850	1045	0711
MULT10	A	006	1054	0617	0619
MULT12	A	006	1024	0558	0600
MULT40	A	006	0F96	0558	0560
N	A	001	145E	0986	0266* 0393* 0732* 0751* 0844* 0883*
NADAP	A	004	1C9F	1290	1277
NEG1	A	002	1DC4	1369	1084 1107
NN	A	001	16BB	1025	0805* 0817*
NODEF	A	002	16C1	1028	0784
NOTDEF	A	001	115B	0718	0539 0671
NOTFND	A	004	0C39	0232	
NUNCK	A	004	1CB0	1297	1291
NXTID	A	004	138A	0515	0837
NXTONE	A	004	0F78	0552	0543 0707
OBYTE	A	006	10A7	0653	0605
OK	A	001	0AE2	0114	0103
OKCTR	A	001	1834	1122	
OLDEC	A	001	169A	1004	0294* 0307
ONE	A	003	18ED	1188	0315 0559 0572 0587 0599 0618 0628 0700 0703 0706 0878 1150 1358 1389 1394 1401 1455 1484 1485

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
DTCRZ	A	006	1E09	1398	1393*
OUTREC	A	001	16C4	1031	0544* 0545* 0555 0556 0614 0615 0680 0695 0698 0700* 0702* 0703* 0784* 0790 0806 0930 0946 1033
PACK	C	001	0226	1634	
PCOUNT	A	001	17D6	1042	0548* 0706*
PIAR	C	001	0020	1625	
PLUS2	A	001	144A	0975	0185 0188 0189
PN	A	003	1A8C	1062	0228
PRINT	C	001	021A	1622	0051 0055 0059 0063 0067 0071 0075 0079 0083 0087 0107 0118 0122 0126 0130 0134 0138 0173 0232 0322 0326 0330 0334 0338 0342 0348 0360 0365 0369 0409 0431 0467 0472 0708 0712 0908 1087 1109 1278 1328 1430 1472 1488
PRTSNS	A	004	1E39	1419	1283 1292 1297
PSR	C	001	0004	1626	
P1IAR	C	001	0020	1632	
R	A	001	1454	0983	0265* 0352* 0731* 0750* 0843* 0882*
RCVDAD	A	002	1F45	1493	1441 1482
RCVMSG	A	025	1F87	1501	1446* 1447 1447* 1460* 1475
RCVMVC	A	005	1ECF	1460	1452* 1456*
RDDIAG	A	001	1C78	1273	1268
RDFCF	A	001	1DD7	1383	0509 0534 0538 0777 0782 0799 1309
RDIAG	A	006	1CC1	1305	1295
RDPASS	A	001	1B37	1125	
READA	A	002	1B39	1126	
RECLSW	A	001	1B36	1124	
REMEXP	A	001	1F8E	1505	1448* 1465* 1466
REMRCV	A	001	1F8F	1506	1449* 1461* 1466 1465
REPET	A	003	1CE7	1318	1327
RKDN	A	005	1DC2	1368	
RR	A	001	16B7	1022	0804* 0816*
RTN1	A	001	0A3A	0037	0015
SAVPTR	A	002	144E	0978	0354* 0403 0495 0832 0915*
SAVXR1	A	004	1D19	1337	1313*
SAVXR2	A	004	1D1D	1338	1314*
SAV1	A	002	1693	1003	0303* 0311
SBYTE0	C	001	0208	1644	
SBYTE2	C	001	020A	1645	
SBYTE3	C	001	020B	1646	
SDISP4	A	002	1691	1002	0286* 0304 0310*
SEKBSY	A	004	1C31	1227	1081
SEKFLG	A	002	1F8B	1503	
SELB	A	004	185F	1149	
SELDSK	A	004	185B	1147	0197
SENEXT	A	004	1F40	1491	1419* 1420 1490*
SENSE	A	004	1D93	1357	1274 1426
SETDRV	A	001	1E72	1439	1437
SETMSK	A	004	1E82	1443	1481 1486
SETRUN	A	006	18E1	1186	1158 1168 1178
SETSNS	A	006	1E76	1441	
SETWRT	A	004	1250	0804	0785
SIO	A	003	1C2B	1216	1205* 1207* 1208* 1210* 1213*
SKBUSY	A	004	1A96	1079	0271 0388 0527 0738 0769 0791 0849 0889 1085
SKCYL0	A	006	0F26	0522	0516
SKDV02	A	006	108C	0631	0626
SKD02	A	006	1014	0591	0585
SKD12	A	006	0FDA	0575	0570
SKMSG	A	004	0D65	0353	0210
SKMVC	A	003	0D0D	0313	0291
SKMVC1	A	003	1321	0876	0867
SNS	A	004	1DB6	1365	1360* 1361* 1364*
SNSEXT	A	004	1DBA	1366	1204* 1206 1359*
SNSHED	A	014	1FCD	1512	1433
SNSMOV	A	006	1DA5	1361	1357*
SNSPRM	A	001	1E56	1427	1421* 1424
SNSWD0	A	001	1FCE	1513	1435
SPUT	A	003	0A0C	0017	

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
SSW02	C	001	0020	1647	
SSW04	C	001	0008	1648	
SSW07	C	001	0001	1649	
SSW1A	C	001	0020	1660	
SSW10	C	001	0080	1650	
SSW11	C	001	0040	1651	
SSW12	C	001	0020	1652	
SSW13	C	001	0010	1653	
SSW14	C	001	0008	1654	
SSW15	C	001	0004	1655	
SSW16	C	001	0002	1656	
SSW17	C	001	0001	1657	
SSW18	C	001	0080	1658	
SSW19	C	001	0040	1659	
SSW2F	C	001	0001	1661	
STATUS	A	002	1DC8	1371	1276 1290 1365* 1440* 1493
STEP	A	003	1F08	1476	1451 1457* 1470
STRTIO	A	004	1BF7	1204	0267 0276 0384 0395 0506 0523 0531 0734 0742 0752 0765 0774 0787 0796 0808 0820 0845 0854 0885 0893 1306
SVPFC	A	025	0A39	0025	0479*
SVPREQ	A	002	1BF6	1193	0380 0493
SVUPDT	A	001	16A0	1005	0142* 0143 0143* 0144 0148 0163 0182 0187* 0212 0353
SWITCH	A	001	1449	0974	0151* 0180 0186*
SYSTEM	C	001	0200	1633	
TBLENA	A	002	184C	1135	
TERM	A	022	1918	1051	0911
TERROR	A	004	1C68	1261	1257* 1339
TEST	C	001	0212	1623	
THREE	A	002	1BF1	1190	1490
TIOBSY	A	004	1C51	1246	1155* 1166* 1176* 1184* 1245*
TIOERR	A	004	1C70	1268	1153* 1164* 1174* 1182* 1260
TIOEXT	A	004	1C41	1231	1227*
TIOSEK	A	004	1C3D	1230	1156* 1167* 1177* 1185* 1229*
TIXE	A	004	1E2E	1405	1395* 1402
TO	A	002	1CFD	1325	1321*
TOBYT	A	006	1E24	1403	1397*
TSTEXP	A	004	1ED8	1462	1442* 1445* 1459 1485*
TSTMSK	A	001	1F4A	1496	1443
TSTRCV	A	004	1EC8	1458	1441* 1444* 1478 1482 1484*
TWELVE	A	002	17D5	1041	0568 0571 0573
TWO	A	002	1BEF	1189	0583 0586 0588 0624 0627 0629 1391
TWOASK	A	002	1F89	1502	1468
TYEOT	A	006	1E03	1397	1392*
UNITS	A	001	1E33	1408	1400
UNPACK	C	001	021E	1624	0674 0678 0689 0693 1322
UNP1	A	002	10ED	0677	0672*
UNP2	A	002	10F6	0681	0673*
UNP3	A	002	1113	0692	0687*
UNP4	A	002	111C	0696	0688*
UPDATE	A	040	1940	1052	0351
UTAB	C	001	0232	1074	0209 0217 0356 0407 0420 0429 0443 0464 0483 0488 0838 0900
WDFCF	A	001	1DCD	1374	0526 0768
WFA6	A	001	117C	0726	0501
WFA67	A	001	0EEC	0498	0426 0452
WORK	A	002	17D3	1040	0096* 0097 0145* 0146 0147 0149* 0150 0157* 0158 0165 0183 0187 0554* 0558* 0562* 0563* 0568 0571* 0573 0576 0582* 0583 0586* 0588 0598 0613* 0617* 0631* 0632 1083 1083 1106 1106
WRFA0	A	001	11E4	0764	0494
WRITEA	A	002	1838	1127	
WRTCF	A	001	16B2	1019	0811 0823
WRT2	A	001	16BC	1026	
WR47	A	004	133E	0882	0839
WTIDS	A	004	0B42	0152	0179 0184 0192
WTIDS1	A	006	0B9F	0187	0150* 0188*
WTRD#	A	004	0AB0	0096	0113
XREG	A	002	1BF4	1192	0379 0492

FC21 3340 IPL FORMAT PROGRAM --MODEL 12

CROSS-REFERENCE

SYMBOL	T	LEN	VALUE	DEFN	REFERENCES
XR1	C	001	0001	1627	0044* 0045 0101* 0102 0104 0104* 0105 0164* 0165 0167 0167* 0168 0212* 0213 0215 0251 0251* 0252 0254 0285* 0286 0287* 0290 0292 0295 0297 0303 0304* 0306 0307 0308 0309 0309* 0310 0311* 0313 0313* 0353* 0354 0358 0382 0403* 0404 0454* 0458 0459 0459* 0499* 0500 0546* 0673 0682 0685 0685* 0688 0704 0704* 0832* 0833 0833* 0834 0836 0863* 0866 0868 0870 0872 0876 0876* 0915 0921* 0923 0925 0926 0926* 0929* 0933 0933 0934 0934 0935 0935 0936 0936 0937 0937 0938 0938 0939 0939 0940 0940 0941 0942 0942* 0956* 0959* 0960* 0961* 1080* 1084* 1103* 1107* 1149* 1157 1160 1170 1206* 1207 1208 1209 1217 1313 1315* 1318 1318* 1320 1337* 1420* 1421 1422 1428 1435* 1450 1452 1453 1454 1457 1460 1464 1476 1476* 1477 1477*
XR2	C	001	0002	1628	0144* 0145 0148* 0149 0163* 0182* 0183 0217* 0224 0225 0226 0227 0288* 0292 0293 0294 0295 0296 0297 0298 0299 0299 0306 0308 0314 0314* 0453* 0456 0460 0460* 0547* 0672 0683 0686 0686* 0687 0705 0705* 0864* 0868 0869 0870 0871 0872 0873 0874 0874 0877 0877* 0930* 0941 0943 0943* 1314 1316* 1319 1319* 1321 1326 1338* 1424* 1425 1436 1443* 1444 1445 1480 1480*
XXX1	A	004	0B88	0182	0147* 0185*
XXX2	A	004	0B98	0186	0181
X203	A	002	1A95	1066	0044
X8000	A	002	1A93	1065	0045
X9000	A	002	1A91	1064	
ZERO	A	002	1F95	1509	0201 0202 0203 0296 0544 0545 0554 0567 0581 0597 0613 0623 0871 1469
ZROTO	A	006	1E15	1400	1398*

TOTAL STATEMENTS FLAGGED IN THIS ASSEMBLY = 0

OBJECT CARD LISTING

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

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
'GBK GBD 'PN 42	48218 EC 827836	3340 MICRO UPDAT	E ON CYL0-MOD 12	84808480	FC210000
TC Y<"BD BT, ""@E&					:$ FC210001
T YR					LZ-FC210002
T+-Z4 &C""3MAFZN	(& EU"HADC2|DY-	@?1HH|IDO.T2|E.C	/0HE NH/C%BG /Y	AMKE¬0H*BF-DZHQT	/0H J/MFC210003
T+-D?F-DYH$C /0H	EAW<SD@BG /YAMBI	T0H*BF-ENF.T /0H	E NQTC%BG /YALS(	*0H*BF-R$H#¬ /0H	S0:D R 4FC210004
T+-.D< F400 EF%	P4@HAECI(ME"H	AG(HA P7" < AE,#	/0HEA-%MR*BG S.	A<@BGB,C /0HE N	UA@ KBDFC210005
T+-%V/0HE NDUO<B	G /YAL2KXOH*BF-E	MI|? /0HE NQVM*B	G /YFHKN:|D OY 0	DEZ@GY<HBEZ%4 /¬	LC D 0H FC210006
T+-_-E5-P400AB8%	P4@HBEZ04 /¬LC D	.Y/¬L+"@MK*BG S.	A8T E*<(J¬LEDT	2-0B /E0-D0ZM4	A J* :84FC210007
T+->$4"FAG(HA X7	" < AB57 /0HEA-%	MR*BG S.A<@BGB4H	8"1J1@Z L0-H0W24	AE*<A0HD.&-8 B8%	MKTY ;H FC210008
T+-?0"1JIC D0XA¬	LC- .Y/JHC- .0AJ	H0H*BH%GT0H*.&-0	B@MME@BGF5% 0H*	.2-0AEPY¬V&0AE)Y	¬V&0 5A FC210009
T+-0J J0:G9M@&BE	JCG*WUBEJ+H B<@B	&CCFB JE$L&DAEC$	2-N((&D0D|FA0&H	B T. /0HDH(=XCE@	OT&- R28FC210010
T+-1<7"HGNB0FEUH	". GCLJ@% /EHA20	EYUIC FC+1D<< H	0J/D|8Y*10H*BF%Q	7F&.A *BG S.A *B	GCD< K5%FC210011
T+-2G0H*EHSC¬Y 1	¬E*4H7"FGC*BG SY	-7:0<P10_B("K &I	'"0C2-&Z'& C2-&L	/0?2|B@MNC0 EET	/1% 6D*FC210012
T+-3E'0 EC" /1D	00H**0*BGCIU< J7	HEY" /177 & ML@B	GF>$ /11R0H*<%30	CED3B KQ$(D0U*H	AE08 J30FC210013
T+-3'0-HM$X4 C|H	A&I0C 5>@ &%A/E	EGZ0IC/K<AJ&¬VR0	IG/=@ D=%.49|(D	0U3MAEZE% -HBL 0	<EZY ;J FC210014
T+-48$ 0NG_HAHC&	AEZD5 JEL4-E-8-I	&C0 MLA?_0 D<130	E04<C/N%E07 /0H	E N V2%BG /YBHBP	20H* J1&FC210015
T+-53 /YAHBQE0H*	BF-DYIU. /0HE K-	WE%BG /YFHEEK0H*	EH%.U0H*BF-QYFMC	B JE$(DMLTS T|	2DC 8HDFC210016
T+-6>L&DAED$2-KT	/0HE&K-EC%G40H*	BF-E$FWX /0HEAS	ES*BG S.A*CGEF"&	11J?6L&DAED$ -&:	00H* 4AYFC210017
T+-7ZF"* JJ|0H*	EV%B6GEX /07A|AU	MNCODEE-< J7HG87	/177 & ML@BGF>$	/11R0H*(83MAED9	(&D 6T<FC210018
T+-8UEDT -&8W+H	B<"H&D<BG /ZF11V	X0¬| /0HSC¬| /0H	DH(=X+H B<"H&A-1	¬EY4H7@8G SYD7:¬	/08 7D%FC210019
T+-9¬#CS T|2DAC	/CHEJS*RT%G20H*	BH%G20H*BHSC¬Z-0	GEC0H73S T|2D 0	<P10_B(@F 1&@EDC	/0H :$QFC210020

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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+-:EH/ (A0T|EC3	J+K|*MH-*@AC>3	E -SH0-D2V<BGC"8		&SFED$ --9P$ H	B _HA =HB @BGCY 8- H 1-0FC210021
T+-#N<"H&F<BG /Z	A</X 0¬G /0HEASQ	R9%BG S.A8&0QBTU	HF<BG SYD7A*9- H	3@/ D+/ HF*EG$ H	8- H :L-FC210022
T+-@&<"H&C-1¬E*5	5P3GEF"&11J?E0H*	J$CMAED9(&D0D%	ADP0< J7HGL# /17	7 &*)S@EGF>$ /0@	|| 2HCFC210023
T+-'.E%<&AA$B+&<	)I"H&BC0AE%<@ A$	BC D)2/¬E0H*$*0	G*7 /1CC0H**0*E	GC4C /177 &D)58@	GF>Q 0ZC FC210024
T+-=F0H**0*BGC5&	9 /7P0A J0@BGC7-	< J$HG9M< J$FG9P	E J¬T0-FCC30HE*Q	9 14X0A &|-0AE*<	¬V&0 *E&FC210025
T+-"A J¬GE%0< J¬	IE%-@FAJ<C-JP41¬	GC0 MLA?_0 D|V-8	AE*<P2&@AE*<P2&0	AED0¬V&4AE*<P5¬H	B "H QY0FC210026
T+-"@/10| J¬LE'M	+ JJ<F=4(J¬LE'P	-"DC DP21J<C D	P3J¬LC DMLA=NC D	P41¬.C&DP4177@-H	C@Y* *:<FC210027
T+/ 7E-@AE*<$#08	AEC0$#&4AE*<$#@	BC"@< J¬|EDC@CAJ	<C DP4J=NC-DP4J¬	LC0 MLA?_0 D&I 8	AE'D =R0FC210028
T+/A2E&7 /1BXC D	P41=NC DP11$FC D	P2J$H| YNL 8AE*<	P10@ ED0$## ADE&	< JJ<G9M(J¬IF="	2 -< :IDFC210029
T+/B_8Y*0C0DP2J?	?C-D#LA?_C&DP2J?	?0 H&)-8/E*<ML 0	AE&@P430 E*D' A¬	I&YDD| HP460 E%<	P33%)10FC210030
T+/CY&A$BC&DP31¬	C@Y&C@Y*D<U C0--	CE%FP4L%&E%F*C1¬	J&Y&C@Y*D+/ 00%B	GDN%4 /C_(D&'%B	G /8 014FC210031
T+/DT J$C C /0H	; /$F A$C F2@ G	K &PS -M4 /DL(D	JG<BG /8AE%H <B	G /8BE%- C4LE%T	2-&U J2*FC210032
T+/E:C- 02A?_&Y*	F| 02 8 E%Q$@)H	AA;HBA&@ E*Q$#*	AC7T /0HE P-QH<B	G /YE:ATH0H*|$ 3	"H|8 7KMFC210033
T+/FR<|&<"2X"<¬@	<U2DL<Z<< BY-E%<	< RYSE%.2/1H<"2>	L<9<<"22L(I<<"26	L(R<@FJJM| &NO 0	AG*Y LH-FC210034
T+/GMG87 /177	ML@BGFZ$ /11R0H*	J%<BGF"*E AJ|0H*	E9%@GGEX /1GC|BD	MNCODEET /177 -	ML& &9DFC210035
T+/H|/1.W0H**0*B	GC:C /1HU0H*$*0	G*7 /1CD0H**0*B	GD--< J7HE@P /17	7 &D)5@BGF>$ /11	R0H*)IUFC210036
T+/IHD/FB /7P@/	IC &02A$A&Y*>0H*	$*0 E%L /1DDCH*	*D*BGDTQ< J7HE@"	/177 &D)5@BGF>$	/10 EHUFC210037
T+/HEO*E6DV @ JE	7|B4D>00DE.QD2 0	AG*YD.@BGF"*B AE	20H*E9%BGGEX /11	B|B@D_30AE.%< J7	HE.C @2QFC210038
T+/. C D#"6?"0H*	$*0H E.. /1.W0H*	*C*BGDDC /1HU(&C	ML_HA X7" |HAAX5	|HA43S T|2DG4	@.1& @0DFC210039
T+/.#NC0 EET /17	7 ML@BGFZ$ /11	R0H*K6-0AG*YCT@E	EF"*A AJ|0H*E9%B	GGEX /1.4| <ML<H	AE08 :3DFC210040
T+/<60-HM$X4 C|H	AF90C 5>@ K*B68	MT MMG9O*BJ8¬? A	|.B'*L*HAQ+HBM @	ED0$## AD0 @ AN	_C E 7.0FC210041
T+/(1EC0N$L0?EE&	8 AJCC D)2/E|0H*	$*0 ED" /1DD0H*	*D*BGD57 /177 -	ML@BGF>$ /11R0H*	L*L- 4ZWFC210042

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OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/+%- H3&/ E0H*	BH-C /0HEA/0RF<B	G SY (DML%BGCE&	4BA|*0-DH-L1MED1	*4 C2 &(@H-CK &D	| A& ME0FC210043
T+/|XLAJD0 DLX%H	AEH|@ /S&|AMMLE8	&E; DAP-DA N8	A &E; -DAP-HA N8	C &E; 0DAX H (H	AA+H 3E%FC210044
T+/6S -<| AJ<EDL	J| CC&H?1*C0H*	C&HECH#- SIC D	MLAJBC0 HSAJD@YH	H(-DM(<BGE 0< AJ	<BHU 4I*FC210045
T+/J)(-DMLCGAED0	6 JJ<0H* F @|C	G&|C0&|C0&|C1	& CC"@ -	& H C	E6)U ;8<FC210046
TC1J_5_V &DA &D	A& Y B0				=80FC210047
T(J%CEF8 &DA	&DA & |"	J4?@|Y =%C:¬" M	*"T?= HA D	.& -	K38FC210048
T+/¬=E%& < C	"8WG3&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&D 1YHFC210049
T+/-9&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&D KZ4FC210050
T+//4&DA &DA &DA	&DA &DA &DA &DA	&DCW2)N &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&D ;BUFC210051
T+/S?&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&D 7A4FC210052
T+/TD&DA &DA &DA	&DA &DA &DA &DA	&DA &<GC@@$A'4C	N5>(S_N 5@GC4WA	-0*LD&<XT&+|O&+|	H1M ':0FC210053
T+/UV5@GC4UCA5*J	8@TE5MCR1)|OO*J	1%|2&DA 8%PC8@X	O5MCT1)XM2)PA8@P	D&DA 1<GT0MCM5%L	U4@M :E-FC210054
T+/V-&<XS&(PO9UC	B1*XN14CU5@LA8@P	D&CA &DA 5'|A0@.	1<PC4UCF0¬) 2)N	4'$A1<PRQ(XE8%P	T&+< M3YFC210055
T+/W$2<N 2<GL8'¬	L0*|E&<LE0'I 1%G	&&<XN&(|OO*LE&OC	R1:.E84CT2<N 2<G	LE'¬L0*|E&<|1'4C	F5_< ¬C*FC210056
T+/XO4'$W1*J 0>/	1%GO&<XN&(|OO*L	E&CCR1:.E84CT2<N	2<GLE'¬R5%¬RO)J	0"G7&+$I4'(1(R	8@- 5H FC210057
T+/YJ1MCL5%GD2)P	G&($F&<$A@(PC8@N	:&+TC9CCA6*N 6;L	N5*XN14CF6)$M6<G	L84CL5%GD1)V &DC	I1U MIMFC210058
T+/Z<@"|4@DCM2*|	R5WCC5%LE&(PO84C	L5%GC1*J.&<&A&DC	M9+.T&<.E&+LP1<G	T1*J(%TI 0@/ 0@G	U8%M "&%FC210059
T+/DG8UCC5_PT6)$	L&+.T5_XE&+|O&<.	E&(|OO*LE1E7B1*$	O&*N 1%G&&($R&<$	A'4CC0)\ 0%N 9(¬	DO;< 1L&FC210060
T+/.B1*LP5MCE04B	& H -<4BA.V0-D	G4<BGGCG /1.SCGB	C4/TK(-D)1< AFZ.	/0HE1/YE8*DE0H*	BH%D LHOFC210061
T+/.'A*BGF.#B9+.	Y&+|O5UCL5_PG&<G	F@@PR&<E 8%PE4%E	G 4BA%30-CAU<B	GGDP /1%0CQ@04/T	K(-D 1:QFC210062
T+/%8G*L J.D0H*	BF%CGF2"A%%BG S.	AA%BGF0#A8=|A0&T	M1)PT&<.U@>/ 8'$	O&(|O5+¬ /0	A% =HYFC210063
T+/_3N/_E1%|C2<-	H CC0@THF4?	F0&|H2<$C0@THE|C	0=C&HF=Y5 J?DC-D	$:/?_|< $@T3FGB&	@0A0 &SUFC210064

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FC21 3340 IPL FORMAT PROGRAM --MODEL 12

OBJECT CARD LISTING

CL 1 THROUGH 16	CL 17 THROUGH 32	CL 33 THROUGH 48	CL 49 THROUGH 64	CL 65 THROUGH 80	CL 81 THROUGH 96
T+/>>*L3DGB-@0/1	K|<D*|X7J |HAOX7	K |HAF33HF"H@3/0	U|<-**L3<G9-&2/1	K|<U*|?HG+P7L |H	AF30 EL%FC210065
T+/?Z4A?2|(Q*IC3	&GGD@5A0Y|(H*MT3	JGC#2/1-&6A?2|(8	*IC3QGGD@7AOY|(Y	*MT3RGC8+ J?DG*$ /0 J&MFC210066
T+/6U & B <	- D 3&HG$4< A0	%F"H5 J6'F <*.	* A0_ J0AG*0C+0-	*.CUHF".2D &:BA0	%<*Q 88 FC210067
T+/1¬G*011A7H@@	4H*D(-*JCQHG*Q	4BA1 0*D <BG	4BA1Q(--)1T&HGEL	A0- OH* C&HGF%	6BA4 "E&FC2'0068
T+/2E1T&HGF"2/0T	/0 0H* <G GGT	/11%0H*)U0H8 J7	H@Z $OH*BF%H(GM?	AB<BGGTWE C /0H	S0&- 3B&FC21006&
T+/3N0H**VLX0G*¬	2D . /189/& @Y*	J0H*:+0M <EG S.	AB%BGG.*< J7HGL@	/1?? &*)5@BGF>$	/10 *Q-FC210070
T+/4&53&AGJ04 /4	-0-D)I<HEGNPK &.	S -M4 J3@(H*"*E	G /8B .7" *	AG+¬ /0HEJUQ)U*D	I0H* &SMFC210071
T+/5. S.AB*BGG&"	B & 0-H <BGGF-			)I*GD0)¬T1)V 0@T	E0*H L#%FC210072
T+/6F1<XA14CS1)P	S1OCX9=¬X&+¬X9=)	9=¬X94CX9=¬X&+¬	X9=) 9=¬X94CX9=¬	X&+¬X9=) 9=¬X94C	X9=* 6H4FC210073
T+/7A94CX9=¬X&+¬	X9=¬"(-)DTQHF=4	4BA6*C)_1?2E <	)_0 + -$@?H&ACY	HG$*00A7H0H* D	& *C8FC210074
T+/7@."" & B-	-	CG HF=44@A8B(--$#3&	HG--4BA8+(--$#L&	HGTD)Q&FC210075
T+/87C D:E C D	:IO C D:F C	:<- AB AB3C0	:</?_8YMHA/ A8	8@H*:F@BG @|C	0@| 8#@FC210076
T+/92@L&HG4<5 J'	CG :N- * J'I %H	BGVE#- C /16L GS	|H&B<BG /YB(/"	(0-D¬3.4E |HA "	C% PC0FC210077
T+/:_//7HC D:21'	EC D:61'GC-H¬KS0	G%L . :6& B&A=	GCC&¬//=G| ¬TT0	G8'' C2-0<* A#	& A0 6L-FC210078
T+/#Y A#- A0 G><	C- :817_C :41#	TG ¬B- & @Z	IGA—¬/0 8"1=|+	|H&BJ0QG68 ||&	¬T-4 QYMFC210079
T+/@T A=+G8"2-&Q	< J'WG8U(J=|G9P	2-&T /0HE LO¬/'H	AF)HA T4AG%X2-&¬	S -G /1:FC&D:21'	E@-D 'A0FC210080
T+/':D 8AG%%$#&8	AG_%$#*BGGY. /0H	EE-8AG4<$@*EG	)11'H E &B &B &	B & A &DA &DA	&D PLQFC210081
T+/=R&DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA &DA	&DA &DA &DA*P	H |" "1)U N.*FC210082
T+/"M6MA &DA &<P	X5@PC8@PD&+.E5:.	E&DA &DA &DA &DA	6*PC1*XV1*J 8%P	N8%N &DA &A.U5*X	T&<< :1-FC210083
T+S |2<PC4W_ 1(X	I9*N &J.U5*XT&<|	H1*|KE4CD6*XV1MC	2D>LN2:(@@TE0'I	.&<LR2:PE&|<K9(P	I84 JK8FC210084
T+SAH0@TE0'I,&<L	R2:PE&|&N8%PE4UC	C&_LP4@PT1O_ 1(X	I9*N @JFS1*PK&<|	O5(¬L1:|EE4CD6*X	V1M 5T FC210085
T+SBE@/PS1*PK&<|	O5(¬L1:|EE4CD6*X	V1MC3E:.E1)I 0'$	N5'|E@@N,&<LR2:P	E&|& XS0&GN&<P	Q5<D 5YMFC21008&

DATE 29AUG75 22DEC75 PROG ID FC2-1
EC NO. 827804 827836 PAGE 22A

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

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T+SD6@E5.&||3*|A  5<XN2MCM2*|R5UC  L5%GO1)V(2*J 1%G  6PO_ 0)PO&+|H1MC  3&"LO&<XP44CL5%G  D1)U :#-FC210089
T+SE1L*XD&<$A*55  .&+|H1;.E&(¬R5%¬  RO)LS&(XE8%XD1MC  O5MCT2<N O&N 1<G  TOMCM5%LU4@N 2)N  8=0 =HQFC210090
T+SF%5UCL5%|A8@X  C5;I.&+|H1;.E&<G  R1PZ &DC1O<|Y4@X  N1<PR&|A 5%TIO@/  2;I 9+.E1DCF5_V  2)* */ FC210091
T+SGX44A &DA &|I  -5)$R5<GL&(¬R5%¬  RO)J C)XE0MA(5+.  E1DCB:DCT2<XS&(¬  R5%¬RO)J 8*R 9(¬  DO;< *EUFC210092
T+SHS1MCC:(|I5*L  E6MCO&+LN4@PS8UC  RS(PN2)PG&<$R5_J  O)|T&(|OO*LE6M?  C1MCDO;|A&(LO1+L  L1M 11%FC210093
T+S.L2*LE8UC15MC  T2<N 5)$RE<GL&(¬  R5%¬RO)J O)XE0MA  (5_V 08GR1+I 5_V  1<XS4%PT8@N)E4C  N5>< 8T<FC210096
T+S<+&<|Y44CO&<$  R5_J 08N 1<E 8@E  5($D9(|EK4CE5;|  E6MCD@MCC6MCD@UC  I5MCT2<N 0*¬U&<L  A8@D 8E8FC210097
T+S(I@>$I8@|H1;I  1_$R&+|H1MCD6*X  V1MCW2;|P&+|H1MC  CO;|A&(LO1+LL1MC  T5UCB1MCU5&LA8@P  DK4 OIHFC210098
T+S+D5)$T1MCT2<G  T&<XF&<L1&<XS&+.  P1*|I;%XE1F_ O=T  L&|A 5_N 8@TE&<|  E&<LA8@E 5($D9(|  E&+O R$OFC210099
T+S+"2)|L&<.E&+L  P1<GT1*J.&<PN8@P  R&+|H1MCD&*XV1MC  A5*J 6*PS1;( 8@T  E&<TA4=(.1)PT1)V  8@- KH&FC210100
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T+S&5@&TE&<|P9DC  DO;|A&+.W2;|C2<P  SKACC5*N 5_V 5($  R1MCF6)$G6*GM8UC  MO;/ O%N 1)PT1)X  E1D 4 HFC210102
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T+SLW4@PT2)$NK4C  N5>|E&+|HO;( 2*R  1%GO&<XS&+.E4@P  C8@PDE4CP6)$G6*G  M6<|1*4CI8UCU8%P  D6<U ORCFC210105
T+SM/5MCT2<N 9(¬  CO;|E&(¬R5%|E8>I  .5%TE5MCF9(PN2)P  G6<$R5_J O)|T&(|  OO*LE6O_ 0*$N8*X  O44 9T<FC210106
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CL 1 THROUGH 16 CL 17 THROUGH 32 CL 33 THROUGH 48 CL 49 THROUGH 64 CL 65 THROUGH 80 CL 81 THROUGH 96

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T+SQ(1MCH0)|T&+.  O&+LP1<GT1;I 5<G  Y&<.E&<LO5*N.&DA  2*J &DCO4@J 1*(  &DCN1;R 1*( &DA  &D "-YFC210110
T+SRH&DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &D "B&FC210111
T+SEC&DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &DA &DA &DA &DA  &D ":&FC210112
TCSEK&DA &DA &DA  &DA &DA ******** ***************** ***************** ***************** *****  QT-FC210113
E A*E7*=-DC"PH$  ="7M&F|  |  C  F%  ASC  R A  SO  Q  09080630751  219751-@FC210114
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