

METER TEST

METER TEST

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1. PURPOSE- TO TEST THE ACCURACY OF THE USE AND CE METERS.
2. PREREQUISITE
- 2.1 PROGRAM- USE THE DIAGNOSTIC RELOCATABLE LOADER.
- 2.2 EQUIPMENT- 4 K WORDS OF CORE STORAGE AND CUSTOMER ENGINEER METER KEY
3. USE PROCEDURE
- 3.1 USE THE DIAGNOSTIC LOADER FOLLOWED BY THIS PROGRAM. AT THE 1131 CONSOLE PRESS RESET AND PROGRAM LOAD. ANY WAITS BELOW /0160 ARE PART OF THE LOADER AND SHOULD BE REFERENCED TO THE LOADER DESCRIPTION
- 3.2 MAKE I/O UNITS READY IN THE FOLLOWING MANNER-
- DISK FILE- PLACE A DISK PACK IN THE DRIVE AND TURN THE POWER SWITCH ON. ALLOW TIME FOR THE DRIVE TO BECOME READY.
- 1132 PRINTER- PLACE PAPER IN THE CARRIAGE, TURN ON THE POWER SWITCH AND PRESS 1132 START.
- 1442 RDR/PCH- PLACE SOME CARDS IN THE HOPPER AND PRESS 1442 START.

- 3.3 WAITS COMMENTS
- 3001 MAKE ANY DEVICE READY THAT IS TO BE TESTED, SEE 3.2, AND PRESS 1131 START.
- 3002 LOG METER READINGS OF THE METER(S) TO BE TESTED AND PRESS 1131 START. ALL UNITS SHOULD HAVE RESPONDED THAT WERE MADE READY EXCEPT RPO DEVICES. CHECK ANY DEVICE THAT DID NOT RESPOND FOR BEING READY, SEE 3.2.
- 3003 END OF TEST. PRESS START TO REPEAT THE TIMING LOOP.
- 3.4 RESTART
- IF IT IS DESIRED TO RESTART THE PROGRAM OR TO RERUN FROM THE BEGINNING, PRESS IMMEDIATE STOP, RESET AND START ON THE 1131. PRESS 1131 START TO RERUN TIMING PORTION OF THE TEST.
- 3.5 POSITIONNING THE METER
- TO ALLOW FOR A MORE ACCURATE READING OF THE METER, START THE TIMING SEQUENCE AND ALLOW IT TO RUN UNTIL THE POINTER IS AT THE DESIRED POSITION. PRESS PROGRAM STOP. THIS WILL STOP THE PROGRAM WITH AN INTERRUPT LEVEL 5. PRESS START TO BEGIN THE TIMING SEQUENCE.

4. PRINTOUTS
- XX CPU SPEED. MAKE DEVICES READY FOR TESTING, THEN PRESS START
- WHERE XX IS THE CPU SPEED AS FOUND BY THE PROGRAM. MAKE ANY DEVICES READY THAT ARE TO BE TESTED, SEE 3.2, AND PRESS START ON THE 1131 AFTER MAKING THE DEVICES READY. THE B-REG SHOULD BE /3001.
- THE FOLLOWING DEVICES RESPONDED- XXXX XXXX XXXX XXXX XXXX
- LOG METER READINGS. PRESS START.
- XXXX INDICATES THE DEVICES THAT WERE READY AND RESPONDED TO A XIO COMMAND. IF A DEVICE DID NOT RESPOND THAT WAS MADE READY, DETERMINE WHY BEFORE CONTINUING THIS TEST. THE B-REG SHOULD BE /3002. LOG METER(S) READINGS AND PRESS 1131 START.
5. COMMENTS
- USE THE CE METER KEY TO START THIS TEST. IF THE USE METERS ARE TO BE TESTED BE SURE TO VERIFY THIS ACTION WITH THE CUSTOMER.
- TIMING IS DONE WITH THE ACCUMULATOR AND WILL ADVANCE THE METER .02 FOR EACH PASS. AT WAIT 3003, END OF TEST, PRESS START TO TIME ANOTHER LOOP.
- A XIO COMMAND IS ISSUED TO ALL DEVICES AND THOSE THAT INTERRUPTED ARE RECORDED AND PRINTED ON THE CONSOLE PRINTER AS VERIFICATION. IF A DEVICE DOES NOT RESPOND, DETERMINE WHY BEFORE CONTINUING WITH THE TEST, SEE 3.2.
- THIS PROGRAM SPACES PRINTERS, READS DISK FILES AND CARDS SO THERE WILL BE NO DAMAGE TO ANY PACK, CARDS OR PAPER IN ANY OF THE I/O UNITS.

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0160          ABS          3B400020
0160 0 03B4    PID DC     /0160      3B400030
                                /03B4    PGM ID  3B400040
*
0161 0 6162    *          3B400050
0162 0 4400 027B BEGIN LDX 1 MSGX-MSG1&1 3B400060
0164 0 032A    *          3B400070
                                BSI L $EBRT CONVERT FBC TO R-T CODE
                                DC     MSG1&1  STARTING ADRS  3B400080
*
0165 0 6500 038A LDX L1 MSGX  ADRS OF MSG AREA  3B400090
0167 0 C400 0209 LD  L SCPTR  GET TERMS AND RESTORE  3B400100
0169 0 D1BF    STO 1 MSG1A-MSGX  3B400110
016A 0 D1D2    STO 1 MSG2A-MSGX  3B400120
016B 0 D1ED    STO 1 MSG3A-MSGX  3B400130
016C 0 D1FF    STO 1 MSG4A-MSGX  3B400140
016D 0 C400 0222 LD  L K8181  GET DOUBLE CR  3B400150
016F 0 D19F    STO 1 MSG1-MSGX  *  3B400160
0170 0 D1C0    STO 1 MSG2-MSGX  *  3B400170
0171 0 D1EE    STO 1 MSG4-MSGX  *  3B400180
*
0172 0 6108    LDX 1 8  3B400190
0173 0 10A0    CLR SLT 32  CLEAR ACC AND EXT TO  3B400200
0174 0 DD00 001E CLR STD L1 30  * CLEAR PRINT AREA  3B400210
0176 0 71FE    MDX 1 -2  3B400220
0177 0 70FC    MDX CLR  3B400230
0178 0 7401 0027 MDX L 39,1  SET TERM BIT  3B400240
*
017A 0 6100    START LDX 1 0  3B400250
017B 0 630F    LDX 3 15  3B400260
017C 0 C400 0202 LD  L S2313  GET RESTART  3B400270
017E 0 D100    STO 1 /0000  * AND STORE IN ZERO  3B400280
*
017F 0 C700 01F1 STAR1 LD  L3 S1442-1  GET BCH AND XFER VECTOR  3B400290
0181 0 D106    STO 1 6  * AND STORE  3B400300
0182 0 7101    MDX 1 1  ADV POINTER  3B400310
0183 0 73FE    MDX 3 -2  REDUCE CTR  3B400320
0184 0 70FA    MDX STAR1  3B400330
*
0185 0 6200    LDX 2 0  SET XR 2  3B400340
0186 0 6E00 0256 STX L2 INTR4  CLEAR INTR ENTRY  3B400350
0188 0 6700 0700 LDX L3 /0700  LOAD COUNT FACTOR  3B400360
018A 0 084B    XIO SHIFT  ISSUE RIBBON SHIFT  3B400370
*
018B 0 7400 0256 STAR2 MDX L INTR4,0  HAS INTR OCCURRED  3B400380
018D 0 7003    MDX STAR4  * YES  3B400390
018E 0 73FF    MDX 3 -1  * NO  3B400400
018F 0 70FB    MDX STAR2  3B400410
0190 0 7004    MDX STAR6  3B400420
*
0191 0 7202    STAR4 MDX 2 2  ADJ SPEED CTR  3B400430
0192 0 7700 FD00 MDX L3 -/0300  IS CPU 5.8  3B400440
0194 0 7202    MDX 2 2  * YES  3B400450
0195 0 0872    STAR6 XIO SCPTR  SENSE CONS PTR DSW  3B400460
0196 0 1004    SLA 4  3B400470
0197 0 4C20 0195 BSC L STAR6,Z  BCH IF STILL BUSY  3B400480
*
0199 0 C600 01EC LD  L2 D1403  GET R-T CODE AND PUT IN  3B400490
019B 0 D400 032A STO  L MSG1&1  * MESSAGE  3B400500
*
019D 0 4400 02A5 BSI L $CPTR  PRINT CPU SPFED  3B400510
019F 0 0329    DC     MSG1  MSG ADRS  3B400520
*
01A0 0 CC00 0002 LDD L /0002  3B400530
01A2 0 3001    W3001 DC /3001  MAKE DEVICES READY  3B400540
*
01A3 0 6108    LDX 1 RESPF-RESP0&1  3B400550
01A4 0 4400 02DA BSI L $CLR  CLEAR RESPONSE AREA  3B400560
01A6 0 020A    DC     RESPO  AREA ADRS  3B400570
*

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*          ISSUE XIO TO EACH DEVICE AND TIME 3B400700
*          WAITING FOR THE INTERRUPT 3B400710
*          3B400720
                                LDX 3 D1442-H1132 3B400730
01A7 0 6316    STAR8 XIO L3 H1132  ISSUE AN XIO  3B400740
01A8 0 0F00 01D8 LDX 1 0  3B400750
01AA 0 6100    STAR9 MDX 1 1  3B400760
01AB 0 7101    MDX STAR9  3B400770
01AC 0 70FE    MDX 3 -2  ADJ FOR NEXT XIO  3B400780
01AD 0 73FE    MDX STAR8  3B400790
01AE 0 70F9    *          3B400800
*
01AF 0 4400 02A5 BSI L $CPTR  READ METERS, PRESS START 3B400810
01B1 0 034A    DC     MSG2  MSG ADRS  3B400820
*
01B2 0 6108    LDX 1 RESPF-RESP0&1  3B400830
01B3 0 630C    LDX 3 0  3B400840
01B4 0 C500 0209 STARB LD  L1 RESPO-1  * DEVICES THAT RESPONDED 3B400850
01B6 0 4C18 01BF BSC L STARC,&-  BCH IF NO RESPONSE  3B400860
*
01B8 0 CF00 035E LDD L3 MSG3X  GET R-T FOR DEVICE  3B400870
01BA 0 DC00 0374 STD  L MSG3  * AND STORE IN MSG  3B400880
*
01BC 0 4400 02A5 BSI L $CPTR  PRINT DEVICE NAME  3B400890
01BE 0 0374    DC     MSG3  MSG ADRS  3B400900
01BF 0 7302    MDX 3 2  ADV POINTER  3B400910
01C0 0 71FF    MDX 1 -1  ADJ COUNT  3B400920
01C1 0 70F2    MDX STARB  3B400930
*
01C2 0 4400 02A5 BSI L $CPTR  PRINT REST OF MSG  3B400940
01C4 0 0378    DC     MSG4  MSG ADRS  3B400950
*
01C5 0 3002    W3002 DC /3002  READ METERS  3B400960
01C6 0 1000    TIME1 NOP  3B400970
01C7 0 C600 01D8 LD  L2 H1132  GET CPU SPEED FACTOR  3B400980
01C9 0 D001    STO *&1  3B400990
01CA 0 6500 0000 TIME2 LDX L1 *- *  LOAD XR 1 WITH FACTOR  3B401000
01CC 0 1010    TIME3 SLA 16  CLEAR ACC FOR START  3B401010
01CD 0 8400 0215 TIME4 A  L K0001  ADD ONE TO ACC  3B401020
01CF 0 4C10 01CD BSC L TIME4,-  BCH IF ACC PLUS  3B401030
01D1 0 71FF    MDX 1 -1  REDUCE LOOP COUNT  3B401040
01D2 0 70F9    MDX TIME3  3B401050
01D3 0 3003    W3003 DC /3003  END OF TEST  3B401060
01D4 0 70F1    MDX TIME1  3B401070
*
***** 3B401080
*          TOCC AND CONSTANT STORAGE 3B401090
*          3B401100
*          3B401110
*          3B401120
*          3B401130
*          3B401140
*          3B401150
*          3B401160
***** 3B401170
                                BSS E 0  3B401180
01D6 0 0000    SHIFT DC S2250  R-T ADRS  3B401190
01D6 0 0206    DC /0900  SHIFT IOCC  3B401200
01D7 0 0900    H1132 DC /00BF  2.2 CPU CYCLE  3B401210
01D8 0 00BF    DC /3440  STOP 1132 PRINTER  3B401220
01D9 0 3440    DC /0077  3.6  3B401230
01DA 0 0077    D1132 DC /3480  START 1132-PRINTER  3B401240
01DB 0 3480    DC /0049  5.8  3B401250
01DC 0 0049    DC /4402  1231 COMMAND  3B401260
01DD 0 4402    D2310 DC BUFFER  READ IN AREA ADRS  3B401270
01DE 0 038A    DC /2600  READ HOME FILE  3B401280
01DF 0 2600    D2311 DC BUFFER  READ IN AREA ADRS  3B401290
01E0 0 038A    DC /8E00  READ FILE # 1  3B401300
01E1 0 8E00    D2312 DC BUFFER  READ IN AREA ADRS  3B401310
01E2 0 038A    DC /9600  READ FILE # 2  3B401320
01E3 0 9600    D2313 DC BUFFER  READ IN AREA ADRS  3B401330
01E4 0 038A    DC /9E00  READ FILE # 3  3B401340
01E5 0 9E00    D2314 DC BUFFER  READ IN AREA ADRS  3B401350
01E6 0 038A    DC /A600  READ FILE # 4  3B401360
01E7 0 A600    D2250 DC K2000  WRITE ADRS  3B401370
01E8 0 0223

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01E9 0 CD00	DC	/CD00	WRITE 2250	38401380
01EA 0 038A	D2501 DC	BUFR	READ IN AREA	38401390
01EB 0 4E00	DC	/4E00	READ A CARD	38401400
01EC 0 D8D8	D1403 DC	/D8D8	22 IN R-T CODE	38401410
01ED 0 AC00	DC	/AC00	SPACE 1403	38401420
01EE 0 DC00	D1442 DC	/DC00	36 IN R-T CODE	38401430
01EF 0 1402	DC	/1402	FEED A CARD	38401440
01F0 0 F4E4	SILSW DC	/F4E4	58 IN R-T CODE	38401450
01F1 0 0300	DC	/0300	SENSE ILSW	38401460
01F2 0 0277	S1442 DC	INTR5	INTR LVL 5 ADRS	38401470
01F3 0 1703	DC	/1703	SENSE 1442 DSW	38401480
01F4 0 0256	S2501 DC	INTR4	INTR LVL 4 ADRS	38401490
01F5 0 4F01	DC	/4F01	SENSE 2501 DSW	38401500
01F6 0 0250	S1132 DC	INTR3	INTR LVL 3 ADRS	38401510
01F7 0 3701	DC	/3701	SENSE 1132 DSW	38401520
01F8 0 0230	S1231 DC	INTR2	INTR LVL 2 ADRS	38401530
01F9 0 4701	DC	/4701	SENSE 1231 DSW	38401540
01FA 0 0229	S1403 DC	INTR1	INTR LVL 1 ADRS	38401550
01FB 0 AF01	DC	/AF01	SENSW 1403 DSW	38401560
01FC 0 0225	S2310 DC	INTR0	INTR LVL 0 ADRS	38401570
01FD 0 2701	DC	/2701	SENSE 2310 DSW	38401580
01FE 0 017A	S2311 DC	START	PGM START ADRS	38401590
01FF 0 8F01	DC	/8F01	SENSE 1ST FILE DSW	38401600
0200 0 4C00	S2312 DC	/4C00	BRANCH INSTRUCTION	38401610
0201 0 9701	DC	/9701	SENSE 2ND FILE DSW	38401620
0202 0 6006	S2313 LDX	/0006	BCH TO ADRS 6	38401630
0203 0 9F01	DC	/9F01	SENSW 3RD FILE DSW	38401640
0204 0 2181	S2314 DC	/2181	SPACE/CARR RET	38401650
0205 0 A701	DC	/A701	SENSE 4TH FILE DSW	38401660
0206 0 0500	S2250 DC	/0500	SHIFT TO BLACK CODE	38401670
0207 0 CF01	DC	/CF01	SENSE 2250 DSW	38401680
0208 0 FFFF	SCPTR DC	/FFFF	CONSTANT	38401690
0209 0 0F01	DC	/0F01	SENSE CONS PTR DSW	38401700
*				
020A 0 0000	RESP0 DC	*--	2310 RESPONDED	38401710
020B 0 0000	RESP1 DC	*--	2311 RESPONDED	38401720
020C 0 0000	RESP2 DC	*--	2312 RESPONDED	38401730
020D 0 0000	RESP3 DC	*--	2313 RESPONDED	38401740
020E 0 0000	RESP4 DC	*--	2314 RESPONDED	38401750
020F 0 0000	RESP7 DC	*--	1231 RESPONDED	38401760
0210 0 0000	RESP9 DC	*--	2250 RESPONDED	38401770
0211 0 0000	RESPC DC	*--	1442 RESPONDED	38401780
0212 0 0000	RESPD DC	*--	2501 RESPONDED	38401790
0213 0 0000	RESPE DC	*--	1403 RESPONDED	38401800
0214 0 0000	RESPF DC	*--	1231 RESPONDED	38401810
*				
0215 0 0001	K0001 DC	/0001	CONSTANT	38401820
0216 0 0002	K0002 DC	/0002	CONSTANT	38401830
0217 0 0004	K0004 DC	/0004	CONSTANT	38401840
0218 0 0008	K0008 DC	/0008	CONSTANT	38401850
0219 0 0040	K0040 DC	/0040	CONSTANT	38401860
021A 0 0080	K0080 DC	/0080	CONSTANT	38401870
021B 0 00C0	K00C0 DC	/00C0	CONSTANT	38401880
021C 0 00FF	K00FF DC	/00FF	CONSTANT	38401890
021D 0 0100	K0100 DC	/0100	CONSTANT	38401900
021E 0 0800	K0800 DC	/0800	CONSTANT	38401910
021F 0 1000	K1000 DC	/1000	CONSTANT	38401920
0220 0 4000	K4000 DC	/4000	CONSTANT	38401930
0221 0 8000	K8000 DC	/8000	CONSTANT	38401940
0222 0 8181	K8181 DC	/8181	DOUBLE CR	38401950
0223 0 2000	K2000 DC	/2000	CONSTANT	38401960
0224 0 0224	DC	*-1	2250 SHORT BCH	38401970

* INTERRUPT LEVEL 0				

0225 0 0000	INTR0 DC	*--	INTR ENTRY	38401980

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0226 0 08CB	XIO	S1442	RESET DSW	38402060
0227 0 4CC0 0225	BOSC I	INTR0	RETURN TO PGM	38402070

* INTERRUPT LEVEL 1				

0229 0 0000	INTR1 DC	*--	INTR ENTRY	38402100
022A 0 08CB	XIO	S1132	RESET DSW	38402110
022B 0 08AC	XIO	H1132	HALT 1132 PRINTER	38402120
022C 0 C0F0	LD	K0100	GET RESPONSE INDICATOR	38402130
022D 0 00E1	STO	RESP7	SET INDICATOR	38402140
022E 0 4CC0 0229	BOSC I	INTR1	RETURN TO PGM	38402150

* INTERRUPT LEVEL 2				

0230 0 0000	INTR2 DC	*--	INTR ENTRY	38402180
0231 0 6104	LDX	1 4		38402190
0232 0 08BD	XIO	SILSW	SENSE DEIVICE	38402200
0233 0 1140	SLCA	1 0	FIND DEVICE CAUSING INTR	38402210
0234 0 C400 0001	LD	L /0001	GET CONTENTS OF XR 1	38402220
0236 0 1002	SLA	2	MULT BY 4	38402230
0237 0 D400 0001	STO	L /0001	SET CONTENTS OF XR 1	38402240
0239 0 4D00 023B	BSC	L1 INTRH	BCH TO DEVICE RTN	38402250
*				
023B 0 08C8	INTRH XIO	S2314	RESET FILE DSW	38402260
023C 0 C0E1	LD	K0800	GET RESPONSE INDICATOR	38402270
023D 0 D0D0	STO	RESP4	SET INDICATOR	38402280
023E 0 700F	MDX	INTRW	BCH TO EXIT	38402290
*				
023F 0 08C2	XIO	S2313	RESET FILE DSW	38402300
0240 0 C0DE	LD	K1000	GET RESPONSE INDICATOR	38402310
0241 0 D0CB	STO	RESP3	SET INDICATOR	38402320
0242 0 700B	MDX	INTRW	BCH TO EXIT	38402330
*				
0243 0 08BC	XIO	S2312	RESET FILE DSW	38402340
0244 0 C0DE	LD	K2000	GET RESPONSE INDICATOR	38402350
0245 0 D0C6	STO	RESP2	SET INDICATOR	38402360
0246 0 7007	MDX	INTRW	BCH TO EXIT	38402370
*				
0247 0 08R6	XIO	S2311	RESET FILE DSW	38402380
0248 0 C0D7	LD	K4000	GET RESPONSE INDICATOR	38402390
0249 0 D0C1	STO	RESP1	SET INDICATOR	38402400
024A 0 7003	MDX	INTRW	BCH TO EXIT	38402410
*				
024B 0 08B0	XIO	S2310	RESET FILE DSW	38402420
024C 0 C0D4	LD	K8000	GET RESPONSE INDICATOR	38402430
024D 0 D0BC	STO	RESP0	SET INDICATOR	38402440
024E 0 4CC0 0230	INTRW BOSC I	INTR2	RETURN TO PGM	38402450

* INTERRUPT LEVEL 3				

0250 0 0000	INTR3 DC	*--	INTR ENTRY	38402460
0251 0 08B4	XIO	S2250	RESET 2250 DSW	38402470
0252 0 C0C6	LD	K0040	GET RESPONSE INDICATOR	38402480
0253 0 D0BC	STO	RESP9	SET INDICATOR	38402490
0254 0 4CC0 0250	BOSC I	INTR3	RETURN TO PGM	38402500

* INTERRUPT LEVEL 4				

0256 0 0000	INTR4 DC	*--	INTR ENTRY	38402510
0257 0 6105	LDX	1 5		38402520

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0258 0 0897      XIO  SILSW  SENSE DEIVICE      38402740
0259 0 1140      SLCA 1 0    FIND DEVICE CAUSING INTR 38402750
025A 0 C400 0001 LD  L /0001  GET CONTENTS OF XR 1    38402760
025C 0 1002      SLA  2      MULT BY 4              38402770
025D 0 D400 0001 STO  L /0001  SET CONTENTS OF XR 1    38402780
025F 0 4D00 0261 BSC  LI INTR5 BCH TO DEVICE RTN 38402790
                                38402800
                                38402810
0261 0           INTR5 EQU  *              38402820
0261 0 0896      XIO  S1231  RESET 1231 DSW          38402820
0262 0 C0B2      LD  K0001  GET RESPONSE INDICATOR 38402830
0263 0 D0B0      STO  RESPF  SET INDICATOR          38402840
0264 0 7010      MDX  INTRX  BCH TO EXIT          38402850
                                38402860
                                38402870
0265 0 0894      XIO  S1403  RESET 1403 DSW          38402870
0266 0 C0AF      LD  K0002  GET RESPONSE INDICATOR 38402880
0267 0 D0AB      STO  RESPE  SET INDICATOR          38402890
0268 0 700C      MDX  INTRX  BCH TO EXIT          38402900
                                38402910
                                38402920
0269 0 088A      XIO  S2501  RESET 2501 DSW          38402920
026A 0 C0AC      LD  K0004  GET RESPONSE INDICATOR 38402930
026B 0 D0A6      STO  RESPD  SET INDICATOR          38402940
026C 0 7008      MDX  INTRX  BCH TO EXIT          38402950
                                38402960
                                38402970
026D 0 0884      XIO  S1442  RESET 1442 DSW          38402970
026E 0 C0A9      LD  K0008  GET RESPONSE INDICATOR 38402980
026F 0 D0A1      STO  RESPC  SET INDICATOR          38402990
0270 0 7004      MDX  INTRX  BCH TO EXIT          38403000
                                38403010
                                38403020
0271 0 0896      XIO  SCPTR  RESET CONS PTR DSW      38403020
0272 0 1000      NOP                                38403030
0273 0 1000      NOP                                38403040
0274 0 7000      MDX  INTRX  BCH TO EXIT          38403050
                                38403060
                                38403070
0275 0 4CC0 0256 INTRX BOSC I INTR4  RETURN TO PGM          38403070
*****
*                INTERRUPT LEVEL 5
*****
0277 0 0000      INTR5 DC  *-*      INTR ENTRY          38403130
0278 0 3005      W3005 DC /3005  INTR LEVEL 5 WAIT 38403140
0279 0 4C40 01C6 BOSC L TIME1  RESTART TIMING LOOP 38403150
*****
*                CONVERT EBCDIC TO ROT-TILT
*
*      LDX  1 X      NUMBER OF POSITIONS
*      BSI  L $EBRT  CONVERT CODE
*      DC   ADRS     ADRS OF CODE
*
*      USES  XR1, XR 2
*****
027B 0 0000      $EBRT DC  *-*      ROUTINE ENTRY          38403260
027C 0 C48C 027B LD  I $EBRT  GET CADE ADRS          38403270
027E 0 D003      STO  $EBR2&1  *              38403280
027F 0 6A1A      STX  2 $EBRX&1  SAVE XR 2          38403290
0280 0 6822      STX  $EBRS  SET FLIP/FLOP SWITCH 38403300
0281 0 C400 0000 $EBR2 LD  L *-*      GET CODE FOR CONVERSION 38403310
0283 0 7400 02A3 MDX  L $EBRS,0  IS F-F SW SET 38403320
0285 0 1808      SRA  8          * YES              38403330
0286 0 E095      AND  K00FF  SAVE BITS 2-15      38403340
0287 0 9093      S  K00C0  ADJ EBC CODE          38403350
0288 0 4828      BSC  6Z      IS VALUE GREATER THAN CO * 38403360
0289 0 8090      A  K0080  * NO              38403370
028A 0 D400 0003 STO  L /0003  STORE IN XR 3          38403380
028C 0 C700 02E9 LD  L3 ROT  GET ROT-TILT VALUE 38403390
028E 0 7400 02A3 MDX  L $EBRS,0  IS F-F SW SET 38403400
0290 0 700E      MDX  $EBR6  * YES              38403410

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0291 0 1808      *      SRA  8          * NO, POSITION VALUE      * 38403420
0292 0 E811      OR  TEMP      * AND GET 1ST VALUE    * 38403430
0293 0 D480 0282 STO  I $EBR2&1  STORE IN CODE AREA  * 38403440
0295 0 7401 0282 MDX  L $EBR2&1,1 ADV AREA ADRS    * 38403450
0297 0 71FF      MDX  1 -1      ADJ CTR              * 38403460
0298 0 70E7      MDX  $EBR2-1  *              * 38403470
                                * 38403480
                                * 38403490
0299 0 6600 0000 $EBRX LDX  L2 *-*      RESTORE XR 2          * 38403500
029B 0 7401 027B MDX  L $EBRT,1  ADJ RETURN ADRS    * 38403510
029D 0 4C80 027B BSC  I $EBRT  RETURN TO MAINLINE * 38403520
                                * 38403530
                                * 38403540
029F 0 D004      $EBR6 STO  TEMP      SAVE VALUE IN STG    * 38403550
02A0 0 1010      SLA  16      CLEAR ACC AND      * 38403560
02A1 0 D001      STO  $EBRS  * F-F SWITCH      * 38403570
02A2 0 70DE      MDX  $EBR2  DO 2ND HALF      * 38403580
                                * 38403590
02A3 0 0000      $EBRS DC  *-*      FLIP-FLOP SWITCH  * 38403600
02A4 0 0000      TEMP DC  *-*      TEMPORY STG      * 38403610
*****
*                CONSOLE PRINTER ROUTINE
*
*                CALLING SEQUENCE
*
*      RSI  L $CPTR  USE CONS PTR RTN
*      DC   ADRS     PRINT AREA ADRS
*
*      TERM MSG WITH /FFFF
*****
02A5 0 0000      $CPTR DC  *-*      RTN ENTRY          * 38403730
02A6 0 C400 000C LD  L /000C  GET OLD XFER VECTOR  * 38403740
02A8 0 18D0      RTE  16      * AND SAVE IT IN Q-REG * 38403750
02A9 0 C02A      LD  $CDSW  GET IMTR ADRS AND  * 38403760
02AA 0 D400 000C STO  L /000C  * SET IN XFER VECTOR  * 38403770
02AC 0 C480 02A5 LD  I $CPTR  GET PRINT AREA ADRS * 38403780
02AF 0 D001      STO  $CP02&1  *              * 38403790
02A1 0 C400 0000 $CP02 LD  L *-*      GET ROT-TILT CODE  * 38403800
02B1 0 D026      STO  $CPDT  SAVE              * 38403810
02B2 0 F026      EGR  $FFFF  *              * 38403820
02B3 0 4818      BSC  +      *              * 38403830
02B4 0 7012      MDX  $CP08  *              * 38403840
                                * 38403850
                                * 38403860
02B5 0 081E      XIO  $CDSW  SENSE DSW          * 38403870
02B6 0 1005      SLA  5          *              * 38403880
02B7 0 4828      RSC  +Z      IS CONS PTR RDY    * 38403890
02B8 0 3061      DC  /3061  * NO              * 38403900
02B9 0 081C      XIO  $CPRT  PRINT A CHARACTER * 38403910
02BA 0 3062      DC  /3062  WAIT FOR INTR    * 38403920
02BB 0 C01C      LD  $CPDT  GET CHAR          * 38403930
02BC 0 1008      SLA  8          * AND SHIFT TO PRINT * 38403940
02BD 0 D01A      STO  $CPDT  SAVE              * 38403950
02BE 0 0815      XIO  $CDSW  SENSE DSW          * 38403960
                                * 38403970
                                * 38403980
02BF 0 1005      SLA  5          *              * 38403990
02C0 0 4828      BSC  +Z      IS CONS PTR RDY    * 38404000
02C1 0 3061      DC  /3061  * NO              * 38404010
02C2 0 0813      XIO  $CPRT  PRINT A CHARACTER * 38404020
02C3 0 3063      DC  /3063  WAIT FOR INTR    * 38404030
02C4 0 7401 02B0 MDX  L $CP02&1,1 ADV PRINT AREA ADRS * 38404040
02C6 0 70E8      MDX  $CP02  *              * 38404050
                                * 38404060
02C7 0 7401 02A5 $CP08 MDX  L $CPTR,1  ADJ RETURN ADRS    * 38404070
02C9 0 18D0      RTE  16      GET OLD XFER VECTOR  * 38404080
02CA 0 D400 000C STO  L /000C  * AND RESTORE    * 38404090
02CC 0 4C80 02A5 BSC  I $CPTR  RETURN TO MAINLINE * 38404090

```

METER TEST

METER TEST

```

02CE 0 0000      *$6INT DC   *--*   INTR ENTRY      * 38404100
02CF 0 0804      XIO     $CDSW  SENSE DSW       * 38404110
02D0 0 4810      BSC     -        IS SERVICE RESPONSE ON * 38404120
02D1 0 306F      DC       /306F  * NO              * 38404130
02D2 0 4CC0 02CE *      BOSC I   $6INT  RETURN TO SUBRTN * 38404140
                                * 38404150
02D4 0 0000      *      BSS E    0              * 38404160
02D4 0 02CE      $CDSW DC   $6INT  INTR RTN ADRS   * 38404170
02D5 0 0F01      DC       /0F01  SENSE DSW IOCC  * 38404180
02D6 0 02D8      $CPRT DC   $CPDT  PRINT DATA ADRS * 38404190
02D7 0 0900      DC       /0900  PRINT IOCC     * 38404200
02D8 0 0000      $CPDT DC   *--*   PRINT DATA   * 38404210
02D9 0 FFFF      $FFFF DC  /FFFF  CONSTANT       * 38404220
                                * 38404230
                                * 38404240
                                * 38404250
                                * 38404260
                                * 38404270
                                * 38404280
                                * 38404290
                                * 38404300
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                                * 38404370
                                * 38404380
                                * 38404390
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                                * 38404760
                                * 38404770
02DA 0 0000      *$CLR DC   *--*   RTN ENTRY      * 38404330
02DB 0 C480 02DA *      LD I   $CLR  GET AREA ADRS   * 38404340
02DD 0 900A      S       $CLR1  ADJ ADRS     * 38404350
02DE 0 D004      STO     $CLR2&1 * AND BUILD INSTRUCTION * 38404360
02DF 0 7401 02DA *      MDX L   $CLR,1 ADV RETURN ADRS * 38404370
                                * 38404380
                                * 38404390
                                * 38404400
                                * 38404410
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                                * 38404760
                                * 38404770
02E1 0 1010      *      SLA     16        CLEAR ACC     * 38404390
02E2 0 D500 0000 *$CLR2 STO L1 *--* * STORE IN AREA * 38404400
02E4 0 71FF      MDX     1 -1        * 38404410
02E5 0 70FC      MDX     $CLR2 * 38404420
                                * 38404430
                                * 38404440
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                                * 38404770
02E6 0 4C80 02DA *      BSC I   $CLR  RTN EXIT     * 38404440
                                * 38404450
                                * 38404460
                                * 38404470
                                * 38404480
                                * 38404490
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                                * 38404770
02E8 0 0001      *$CLR1 DC  /0001  CONSTANT       * 38404460
                                * 38404470
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                                * 38404760
                                * 38404770
02E9 0 2100      ROT DC   /2100  SPACE          * 38404520
02EA 0 3E00      DC     /3E00  A              * 38404530
02EB 0 1A00      DC     /1A00  B              * 38404540
02EC 0 1E00      DC     /1E00  C              * 38404550
02ED 0 3200      DC     /3200  D              * 38404560
02EE 0 3600      DC     /3600  E              * 38404570
02EF 0 1200      DC     /1200  F              * 38404580
02F0 0 1600      DC     /1600  G              * 38404590
02F1 0 2600      DC     /2600  H              * 38404600
02F2 0 2200      DC     /2200  I              * 38404610
02F3 0 0200      DC     /0200  CENT          * 38404620
02F4 0 0000      DC     /0000  PERIOD       * 38404630
02F5 0 DE00      DC     /DE00  GREATER     * 38404640
02F6 0 FE00      DC     /FE00  L BKT       * 38404650
02F7 0 DA00      DC     /DA00  +           * 38404660
02F8 0 C600      DC     /C600  LOGICAL OR  * 38404670
02F9 0 4400      DC     /4400  AMPERSAND   * 38404680
02FA 0 7E00      DC     /7E00  J           * 38404690
02FB 0 5A00      DC     /5A00  K           * 38404700
02FC 0 5E00      DC     /5E00  L           * 38404710
02FD 0 7200      DC     /7200  M           * 38404720
02FE 0 7600      DC     /7600  N           * 38404730
02FF 0 5200      DC     /5200  O           * 38404740
0300 0 5600      DC     /5600  P           * 38404750
0301 0 6600      DC     /6600  Q           * 38404760
0302 0 6200      DC     /6200  R           * 38404770

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0303 0 4200      DC     /4200  EXCLAMATION * 38404780
0304 0 4000      DC     /4000  $           * 38404790
0305 0 D600      DC     /D600  *          * 38404800
0306 0 F600      DC     /F600  R BKT      * 38404810
0307 0 D200      DC     /D200  SEMICOLON * 38404820
0308 0 F200      DC     /F200  LOGICAL NOT * 38404830
0309 0 8400      DC     /8400  -          * 38404840
030A 0 8C00      DC     /8C00  /          * 38404850
030B 0 9A00      DC     /9A00  S          * 38404860
030C 0 9E00      DC     /9E00  T          * 38404870
030D 0 B200      DC     /B200  U          * 38404880
030E 0 B600      DC     /B600  V          * 38404890
030F 0 9200      DC     /9200  W          * 38404900
0310 0 9600      DC     /9600  X          * 38404910
0311 0 A600      DC     /A600  Y          * 38404920
0312 0 A200      DC     /A200  Z          * 38404930
0313 0 2100      DC     /2100  *          * 38404940
0314 0 8000      DC     /8000  COMMA      * 38404950
0315 0 0600      DC     /0600  PERCENT   * 38404960
0316 0 BE00      DC     /BE00  UNDERSCORE * 38404970
0317 0 4600      DC     /4600  LESS THAN  * 38404980
0318 0 8600      DC     /8600  QUESTION  * 38404990
0319 0 C400      DC     /C400  0          * 38405000
031A 0 FC00      DC     /FC00  1          * 38405010
031B 0 D800      DC     /D800  2          * 38405020
031C 0 DC00      DC     /DC00  3          * 38405030
031D 0 F000      DC     /F000  4          * 38405040
031E 0 F400      DC     /F400  5          * 38405050
031F 0 D000      DC     /D000  6          * 38405060
0320 0 D400      DC     /D400  7          * 38405070
0321 0 F400      DC     /E400  8          * 38405080
0322 0 E000      DC     /E000  9          * 38405090
0323 0 8200      DC     /8200  COLON     * 38405100
0324 0 C000      DC     /C000  NUMBER SIGN * 38405110
0325 0 0400      DC     /0400  EACH SIGN * 38405120
0326 0 E600      DC     /E600  APOS      * 38405130
0327 0 C200      DC     /C200  =         * 38405140
0328 0 E200      DC     /E200  QUOTES    * 38405150
                                * 38405160
0329 0 8181      MSG1 DC   /8181  DOUBLE CR  * 38405170
032A 0 0016      EBC     . CPU SPEED, MAKE DEVICES READY. * 38405180
033A 0 0015      EBC     . FOR TESTING, THEN PRESS START. * 38405190
0349 0 FFFF      MSG1A DC /FFFF  TERM       * 38405200
                                * 38405210
034A 0 8181      MSG2 DC   /8181  DOUBLE CR  * 38405220
034B 0 0017      EBC     .THE FOLLOWING DEVICES RESPONDED- * 38405230
035C 0 FFFF      MSG2A DC /FFFF  TERM       * 38405240
                                * 38405250
035E 0 0000      *      BSS E    0              * 38405260
035E 0 0002      MSG3X EBC   .1231. * 38405270
0360 0 0002      EBC     .1403. * 38405280
0362 0 0002      EBC     .2501. * 38405290
0364 0 0002      EBC     .1442. * 38405300
0366 0 0002      EBC     .2250. * 38405310
0368 0 0002      EBC     .1132. * 38405320
036A 0 0002      EBC     .FIL4. * 38405330
036C 0 0002      EBC     .FIL3. * 38405340
036E 0 0002      EBC     .FIL2. * 38405350
0370 0 0002      EBC     .FIL1. * 38405360
0372 0 0002      EBC     .FILO. * 38405370
0374 0 0003      EBC     . * 38405380
0377 0 FFFF      MSG3 DC   /FFFF  TERM       * 38405390
                                * 38405400
0378 0 8181      MSG4 DC   /8181  DOUBLE CR  * 38405410
0379 0 0016      EBC     .LOG METER READINGS, PRESS START. * 38405420
0389 0 FFFF      MSG4A DC /FFFF  TERM       * 38405430
038A 0           MSGX EQU * * 38405440
                                * 38405450

```

038A 0 0050 BUFFER DC 80 WORD COUNT
038B 0050 BSS 80 READ AREA
*
03DC 0161 END BEGIN
NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

3B405460
3B405470
3B405480
3B405490

\$CDSW 02D4 02A9 02B5 02BE 02CF
\$CLR 02DA 01A4 02DB 02DF 02E6
\$CLR1 02E8 02DD
\$CLR2 02E2 02DE 02E5
\$CPDT 02D8 02B1 02BB 02BD 02D6
\$CPRT 02D6 02B9 02C2
\$CPTR 02A5 019D 01AF 01BC 01C2 02AC 02C7 02CC
\$CP02 02AF 02AE 02C4 02C6
\$CP08 02C7 02B4
\$EBRS 02A3 0280 02B3 028E 02A1
\$EBRT 027B 0162 027C 0298 029D
\$EBRX 0299 027F
\$EBR2 0281 027E 0293 0295 0298 02A2
\$EBR6 029F 0290
\$FFFF 02D9 02B2
\$6INT 02CE 02D2 02D4
BEGIN 0161 03DC
BUFFER 038A 01DE 01E0 01E2 01E4 01E6 01EA
CLR 0174 0177
D1132 01DA
D1231 01DC
D1403 01EC 0199
D1442 01EE 01A7
D2250 01E8
D2310 01DE
D2311 01E0
D2312 01E2
D2313 01E4
D2314 01E6
D2501 01EA
H1132 01D8 01A7 01A8 01C7 022B
INTRH 023B 0239
INTRS 0261 025F
INTRW 024E 023E 0242 0246 024A
INTRX 0275 0264 0268 026C 0270 0274
INTR0 0225 01FC 0227
INTR1 0229 01FA 022E
INTR2 0230 01F8 024E
INTR3 0250 01F6 0254
INTR4 0256 0186 0188 01F4 0275
INTR5 0277 01F2
K0000 021B 0287
K00FF 021C 0286
K0001 0215 01CD 0262
K0002 0216 0266
K0004 0217 026A
K0008 0218 026E
K0040 0219 0252
K0080 021A 0289
K0100 021D 022C
K0800 021E 023C
K1000 021F 0240
K2000 0223 01E8 0244
K4000 0220 0248
K8000 0221 024C
K8181 0222 016D
MSGX 038A 0161 0165 0169 016A 016B 016C 016F 0170 0171
MSG1 0329 0161 0164 016F 0198 019F
MSG1A 0349 0169
MSG2 034A 0170 0181
MSG2A 035C 016A
MSG3 0374 018A 018E
MSG3A 0377 016B
MSG3X 035E 0188
MSG4 0378 0171 01C4
MSG4A 0389 016C
PID 0160
RESPC 0211 026F

METER TEST

RESP0 0212 026B
RESPE 0213 0267
RESPF 0214 01A3 01B2 0263
RESP0 020A 01A3 01A6 01B2 01B4 024D
RESP1 020B 0249
RESP2 020C 0245
RESP3 020D 0241
RESP4 020E 023D
RESP7 020F 022D
RESP9 0210 0253
ROT 02E9 028C
SCPTR 0208 0167 0195 0271
SHIFT 01D6 018A
SILSW 01F0 0232 0259
STAR8 01B4 01C1
STARC 01BF 01B6
START 017A 01FF
STAR1 017F 0184
STAR2 018B 018F
STAR4 0191 018D
STAR6 0195 0190 0197
STAR8 01A8 01AE
STAR9 01AB 01AC
S1132 01F6 022A
S1231 01F8 0261
S1403 01FA 0265
S1442 01F2 017F 0226 026D
S2250 0206 01D6 0251
S2310 01FC 024B
S2311 01FE 0247
S2312 0200 0243
S2313 0202 017C 023F
S2314 0204 023B
S2501 01F4 0269
TEMP 0244 0292 029F
TIME1 01C6 01D4 0279
TIME2 01CA
TIME3 01CC 01D2
TIME4 01CD 01CF
W3001 01A2
W3002 01C5
W3003 01D3
W3005 0278
END OF ASSEMBLY

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1. PURPOSE

THE CORE ADJUSTMENT PROGRAM LOADS CORE WITH THE BEST CASE AND COMPLEMENT BEST CASE PATTERNS SPECIFIED IN THE ENGINEERING SPECIFICATIONS FOR SJ2 AND SJ4 STORAGE. THIS PATTERN ALLOWS ADJUSTMENT OF THE CORE VOLTAGES AS SPECIFIED IN THE 1130 MAINTENANCE MANUAL.

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES

THE CORE ADJUSTMENT PROGRAM IS LOADED BY THE 1130 RELOCATING LOADER.

2.2 EQUIPMENT PREREQUISITES

- A. 1131 CPU
- B. CARD OR PAPER TAPE READER

3. USE PROCEDURE

3.1 PROGRAM LOADING

3.1.1 TO LOAD FROM CARDS

- A. PLACE RELOCATING LOADER AND PROGRAM DECK IN READER.
- B. MAKE READER READY.
- C. PRESS THE 1131 RESET KEY.
- D. PRESS THE 1131 PROGRAM LOAD KEY.
- E. IF PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW LOCATION 0160, REFER TO RELOCATING LOADER DOCUMENTATION.

3.1.2 TO LOAD FROM PAPER TAPE

- A. PLACE THE PAPER TAPE RELOCATING LOADER IN THE READER.
- B. MAKE READER READY.
- C. PRESS THE 1131 RESET KEY.
- D. PRESS THE 1131 PROGRAM LOAD KEY.
- E. THE LOADER SHOULD HALT AT WAIT 30F6 (B REG).
- F. PLACE THE CORE ADJUST PROGRAM TAPE IN THE READER.
- G. MAKE READER READY.
- H. MANUALLY SET THE INSTRUCTION ADDRESS REG TO /0078.
- I. SET MODE SWT TO RUN AND PRESS PROGRAM START.
- J. IF PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW LOCATION 0160, REFER TO RELOCATING LOADER DOCUMENTATION.

3.2 OPERATING PROCEDURE (SEE SECTION 5. FOR FURTHER DETAILS)

- A. AFTER LOADING THE PROGRAM WILL STOP AT WAIT 3001. SET SWITCHES 14 AND 15 AS DESIRED.
 - SWT 15..ON..LOAD CORE WITH COMPLEMENT BEST CASE PATTERN.
 - ..OFF..LOAD CORE WITH BEST CASE PATTERN.
 - SWT 14..ON..EXECUTE HIGH CORE ADJUST SECTION OF PROGRAM.
 - ..OFF..EXECUTE LOW CORE ADJUST SECTION OF PROGRAM.
- B. PRESS THE 1131 PROGRAM START BUTTON.
- C. THE PROGRAM WILL RUN BRIEFLY LOADING CORE WITH THE PATTERN SELECTED BY SWT 15 AND STOP AT THE END OF THE PROGRAM AT WAIT (3002 OR 3003).
- D. REFER TO 1130 MAINTENANCE MANUAL FOR CORE ADJUSTMENT PROCEDURES.
- E. TO CHANGE THE CORE ADJUST PATTERN OR RERUN THE PROGRAM....
 - 1. SET SWT 15 AS DESIRED
 - 2. PRESS THE 1131 RESET KEY.
 - 3. PRESS THE 1131 PROGRAM START KEY.
- F. THE PROGRAM MUST BE RELOADED TO CHANGE THE SWT 14 SELECTION.

3.3 PROGRAM HALTS

.HALT NO. (B REG).	DESCRIPTION	RESTART ACTION
30F6	LOADER WAIT. SHOULD OCCUR ON PAPER TAPE IPL ONLY.	A. PLACE CORE ADJUST PROGRAM IN READER. B. MANUALLY SET I REG TO 0078. C. SET MODE SWF TO RUN. D. PRESS PROGRAM START.
3001	WAIT FOR SWITCH SETTINGS.	A. SET SWITCH 14... ON..TO ADJUST HIGH CORE. OFF..TO ADJUST LOW CORE. SET SWITCH 15.. ON..FOR COMPLEMENT BEST CASE PATTERN. OFF..FOR BEST CASE PATTERN
3002	END LOW CORE ADJUST.	TO RESTART PROGRAM...
3003	END HIGH CORE ADJUST.	A. SET SW 15 AS DESIRED B. PRESS RESET C. PRESS PROGRAM START

4. PRINTOUTS (NONE)

5. COMMENTS

THE 1130 CORE ADJUST PROGRAM IS MADE UP OF TWO IDENTICAL SECTIONS. THE ONLY DIFFERENCE BETWEEN THESE SECTIONS IS THE CORE LOCATIONS INTO WHICH THEY ARE LOADED. ONLY ONE OF THESE SECTIONS IS EXECUTED FOR EACH TIME THE PROGRAM IS LOADED SINCE EXECUTION OF EITHER SECTION WILL DESTROY THE OTHER.

THE LOW CORE ADJUST SECTION IS SELECTED BY SWT 14 BEING OFF. THIS SECTION IS LOADED INTO THE LAST 2K OF CORE AND IS USED TO ADJUST THE FIRST 8K OF CORE. (THIS SECTION IS ASSEMBLED FOR A 32K MACHINE. IGNORE HIGH ORDER BITS WHEN REFERENCING THE LISTING AND DOCUMENTATION.)

THE HIGH CORE ADJUST SECTION IS SELECTED BY SWT 14 BEING ON. THIS SECTION IS LOADED INTO THE FIRST 2K OF CORE AND IS USED TO ADJUST CORE ABOVE 8K. (THIS SECTION IS NOT USED FOR MACHINES HAVING 8K OR LESS CORE.)

THE CORE ADJUST PROGRAM SHOULD NOT BE EXECUTING WHILE CORE IS BEING ADJUSTED. REFER TO 1130 MAINTENANCE MANUAL FOR CORE ADJUSTMENT PROCEDURE.

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```
***** PROGRAM ID 03A6
*****
*****PROGRAM WAITS*****
*
* B REG * COMMENTS
*****
3001 * SET CONSOLE ENTRY SWITCHES
*
* SWT 15--ON--LOAD CORE WITH COMPLEMENT
* BEST CASE PATTERN.
* -OFF--LOAD CORE WITH BEST CASE
* PATTERN.
*
* SWT 14--ON--EXECUTE HIGH CORE ADJUST ROUTINE.
* -OFF--EXECUTE LOW CORE ADJUST ROUTINE.
*
* PRESS START TO CONTINUE.
-----
3002 * END OF LOW CORE ADJUST ROUTINE.
3003 * END OF HIGH CORE ADJUST ROUTINE.
*
* ADJUST CORE WHILE CYCLING IN AUTOMATIC
* DISPLAY MODE. REFER TO 1130 MAINTENANCE
* MANUAL FOR ADJUSTMENT PROCEDURE.
*****
ABS
0000 ORG /015E
015E 0 03A6 DC /03A6 PID
015F 0 7FFF DC /7FFF
0160 ORG /7800
*****
*
* PROGRAM INITIALIZATION
*****
8000 0 CC00 0184 BEGIN LDD L LINKH SET UP RESTART TO
8002 0 DC00 0004 STD L 4 HIGH CORE ADJUST
8004 0 3001 WAIT 1 WAIT FOR SWITCH SETTING
8005 0 085C XIO RDSWS READ SWITCHES
8006 0 C06A LD SMS
8007 0 1801 SRA 1
8008 0 4C04 0160 BSC L STRH,E BR TO HIGH CORE ADJUST
IF SWT 14 ON.
800A 0 C855 LDD LINK SET UP RESTART TO
800B 0 DC00 0004 STD L 4 LOW CORE ADJUST
*****
*
* LOW CORE ADJUST ROUTINE
*****
*
* DETERMINE SIZE OF CORE
800D 0 6104 START LDX 1 4
800E 0 1010 SLA 16
800F 0 D400 0000 STD L 0
8010 0 D400 6000 STO L /6000 CLEAR LOC 6000 OR 4000
8011 0 C051 LD K0800 CONSTANT
8012 0 1001 LD31 SLA 1
8013 0 D056 STO SIZE
8014 0 D480 786C STO I SIZE
8015 0 7400 0000 MDX L 0,0
```

```
781A 0 7002 MDX LD32
781B 0 71FF MDX 1 -1
781C 0 70F7 MDX LD31
781D 0 71FF LD32 MDX 1 -1 WILL SKIP IF 24 OR 32K
781E 0 7004 MDX **4 4, 8, OR 16K FOUND
781F 0 7400 6000 MDX L /6000,0 WILL SKIP IF 32K
7821 0 C042 LD K6000 FETCH 24K SIZE CONSTANT
7822 0 D049 STO SIZE SET PROPER SIZE
7823 0 C04E LD H6004
7824 0 D400 0000 STO L 0
*
* ADJUST CORE SIZE AND
* CONSTANTS
*
7826 0 74FF 786C MDX L SIZE,-1
7828 0 1000 NOP
7829 0 C03D LD LLM2 ADJUST CONSTANT
782A 0 E041 AND SIZE
782B 0 D03B STO LLM2
782C 0 C042 LD ULIM1
782D 0 E03E AND SIZE
782E 0 D040 STO ULIM1
*
* FIND LOOP CONTROLS
782F 0 C03F LD ULIM1
7830 0 9035 S LLM1
7831 0 D036 STO LOWRL
7832 0 C039 LD SIZE
7833 0 9033 S LLM2
7834 0 9034 S ONE
7835 0 D03A STO UPERL UPPER LIMIT CONTROL
*
7836 0 082B XIO RDSWS READ SWITCHES
7837 0 C039 LD SMS
7838 0 4C04 783D BSC L PAT02,E BR IF SW 15 ON
*
* SET UP BCP OR COMPL. BCP
*
783A 0 6100 PAT01 LDX 1 0
783B 0 62FF LDX 2 -1
783C 0 7002 MDX PAT02+2
783D 0 61FF PAT02 LDX 1 -1
783E 0 6200 LDX 2 0
783F 0 C026 LD LLM1 SET UP TO START AT
7840 0 D02A STO PLOC * 1ST LOWER LIMIT
7841 0 6780 786B LDX 13 LOWRL SET UP LOOP CONTROL
7842 0 4008 BSI BCP SET CORES
7843 0 C022 LD LLM2 SET UP TO START AT
7844 0 D025 STO PLOC * 2ND LOWER LIMIT
7845 0 6780 7870 LDX 13 UPERL SET UP LOOP CONTROL
7846 0 4003 BSI BCP SET CORES
*
7849 0 3002 WAIT2 WAIT 2 END OF PROGRAM
784A 0 4C00 780D BSC L START
*
* BCP AND COMPL. BCP SUBRT
*
784C 0 0000 BCP DC 0
784D 0 C01D LD PLOC EXCLUSIVE OR BITS 7
784E 0 1806 SRA 6 * AND 9
784F 0 D01D STO TEMP
7850 0 1802 SRA 2
7851 0 F01B EOR TEMP
7852 0 4C04 7857 BSC L ODD,E
7853 0 6D80 786B STX I1 PLOC
7854 0 7002 MDX ODD&2
7855 0 6E80 786B ODD STX 12 PLOC
7856 0 7401 786B MDX L PLOC,1 INCREMENT ADDRESS
```

CORE ADJUST PROGRAM

```

785B 0 1000          SLA      0
785C 0 73FF          MDX      3 -1      CK FOR END OF LOOP
785D 0 70EF          MDX      BCP&1    REPEAT
785E 0 4C80 784C    BSC      I BCP      EXIT
*
7860 0000           BSS      E 0
7860 0 4C00 780D    LINK    BSC L START      RESTART LINKAGE
7862 0 7871          RDSWS   DC      SWS
7863 0 3A00          DC        /3A00    READ SWITCHES
7864 0 6000          K6000  DC      /6000    24K CONSTANT
7865 0 0800          K0800  DC      /0800    CONSTANT
7866 0 0006          LLIM1  DC      /0006
7867 0 7873          LLIM2  DC      FIN        2ND LOWER LIMIT
7868 0 0900          LOWRL  DC      0          LOWER LOOP CONTROL
7869 0 0001          ONE      DC      1          CONSTANT 1
786A 0 0000          PATNO  DC      0          PATTERN NUMBER
786B 0 0000          PLOC  DC      0          PRESENT LOC
786C 0 0000          SIZE  DC      0          CONTAINS CORE SIZE
786D 0 0000          TEMP  DC      0
786E 0 0002          TWO    DC      2          CONSTANT 2
786F 0 780D          ULIM1  DC      START    1ST UPPER LIMIT
7870 0 0000          UPERL  DC      0          UPPER LOOP CONTROL
7871 0 0000          SWS    DC      0
7872 0 6004          H6004  DC      /6004
7873 0 0000          FIN    DC      0          LAST LOC OF PROG
*
7874                ORG      /0160
*****
*
*          HIGH CORE ADJUST ROUTINE
*
*****
*          DETERMINE SIZE OF CORE
*
0160 0 6104          STRTH  LDX  1 4
0161 0 1010          SLA      16
0162 0 0400 0000    STO      L 0
0164 0 0400 6000    STO      L /6000    CLEAR LOC 6000 OR 4000
0166 0 C052          LD        K080H    CONSTANT
0167 0 1001          LD31H  SLA      1
0168 0 D057          STO      SIZEH
0169 0 0480 01C0    STO      I SIZEH
016B 0 7400 0000    MDX      L 0,0
016D 0 7002          MDX      LD32H
016E 0 71FF          MDX      1 -1
016F 0 70F7          MDX      LD31H
0170 0 71FF          LD32H  MDX  1 -1    WILL SKIP IF 24 OR 32K
0171 0 7004          MDX      *+4        4, 8, OR 16K FOUND
0172 0 7400 6000    MDX      L /6000,0  WILL SKIP IF 32K
0174 0 C043          LD        K600H    FETCH 24K SIZE CONSTANT
0175 0 D04A          STO      SIZEH    SET PROPER SIZE
0176 0 C04F          LD        H604H
0177 0 D400 0000    STO      L 0
*
*          ADJUST CORE SIZE AND
*          * CONSTANTS
*
0179 0 74FF 01C0    MDX      L SIZEH,-1
017B 0 1000          NOP
017C 0 C03E          LD        LIM2H    ADJUST CONSTANT
017D 0 E042          AND      SIZEH
017E 0 D03C          STO      LIM2H
017F 0 C043          LD        ULM1H
0180 0 E03F          AND      SIZEH
0181 0 D041          STO      ULM1H
*
0182 0 C040          LD        ULM1H    FIND LOOP CONTROLS

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```

0183 0 9036          S        LIM1H
0184 0 D037          STO      LWRLH
0185 0 C03A          LD        SIZEH
0186 0 9034          S        LIM2H
0187 0 9035          S        ONEH
0188 0 D03B          STO      UPRLH    UPPER LIMIT CONTROL
*
0189 0 082C          XID      RDSWH    READ SWITCHES
018A 0 C03A          LD        SWSH
018B 0 4C04 0190    BSC      L PAT2H,E BR IF SW 15 ON
*
*          SET UP BCP OR COMPL. BCP
*
018D 0 6100          PAT1H  LDX  1 0
018E 0 62FF          LDX      2 -1
018F 0 7002          MDX      PAT2H+2
0190 0 61FF          PAT2H  LDX  1 -1
0191 0 6200          LDX      2 0
0192 0 C027          LD        LIM1H
0193 0 D02B          STO      PLOCH    * 1ST LOWER LIMIT
0194 0 6780 01BC   LDX      13 LWRLH  SET UP LOOP CONTROL
0196 0 4008          BSI      BCPH     SET CORES
0197 0 C023          LD        LIM2H  SET UP TO START AT
0198 0 D026          STO      PLOCH    * 2ND LOWER LIMIT
0199 0 6780 01C4   LDX      13 UPRLH  SET UP LOOP CONTROL
019B 0 4003          BSI      BCPH     SET CORES
*
019C 0 3003          WAIT3  WAIT  3     END OF PROGRAM
019D 0 4C00 0160    BSC      L STRTH
*
*          BCP AND COMPL. BCP SUBRT
*
019F 0 0000          BCPH   DC      0
01A0 0 C01E          LD        PLOCH    EXCLUSIVE OR BITS 7
01A1 0 1806          SRA      6          * AND 9
01A2 0 D01E          STO      TEMPH
01A3 0 1802          SRA      2
01A4 0 F01C          EOR      TEMPH
01A5 0 4C04 01AA   BSC      L ODDH,E
01A7 0 6D80 01BF   STX      11 PLOCH
01A9 0 7002          MDX      ODDH+2
01AA 0 6E80 01BF   ODDH   STX  12 PLOCH
01AC 0 7401 01BF   MDX      L PLOCH,1 INCREMENT ADDRESS
01AE 0 1000          SLA      0
01AF 0 73FF          MDX      3 -1      CK FOR END OF LOOP
01B0 0 70EF          MDX      BCPH+1    REPEAT
01B1 0 4C80 019F   BSC      I BCPH    EXIT
*
01B4 0000           BSS      E 0
01B4 0 4C00 0160    LINKH  BSC L STRTH  RESTART LINKAGE
01B6 0 01C5          RDSWH  DC      SWSH
01B7 0 3A00          DC        /3A00    READ SWITCHES
01B8 0 6000          K600H  DC      /6000  24K CONSTANT
01B9 0 0800          K080H  DC      /0800  CONSTANT
01BA 0 0006          LIM1H  DC      /0006
01BB 0 01C7          LIM2H  DC      FINH   2ND LOWER LIMIT
01BC 0 0000          LWRLH  DC      0     LOWER LOOP CONTROL
01BD 0 0001          ONEH   DC      1     CONSTANT 1
01BE 0 0000          PATNH  DC      0     PATTERN NUMBER
01BF 0 0000          PLOCH  DC      0     PRESENT LOC
01C0 0 0000          SIZEH  DC      0     CONTAINS CORE SIZE
01C1 0 0000          TEMPH  DC      0
01C2 0 0002          TWOH  DC      2     CONSTANT 2
01C3 0 0160          ULM1H  DC      STRTH  1ST UPPER LIMIT
01C4 0 0000          UPRLH  DC      0     UPPER LOOP CONTROL
01C5 0 0000          SWSH  DC      0
01C6 0 6004          H604H  DC      /6004

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01C7 0 0000 FINH DC 0 LAST LOC OF PRDG
01C8 7800 END BEGIN
NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

3A602740
3A602750

C R O S S R E F E R E N C E
NAME VALUE REFERENCES
BCP 784C 7843,7848,785D,785E
BCPH 019F 0196,019B,0180,0181
BEGIN 7800 01C8
FIN 7873 7867
FINH 01C7 018B
H6004 7872 7823
H604H 01C6 0176
K080H 0189 0166
K0800 7865 7813
K600H 0188 0174
K6000 7864 7821
LD31 7814 781C
LD31H 0167 016F
LD32 781D 781A
LD32H 0170 016D
LIM1H 018A 0183,0192
LIM2H 018B 017C,017E,0186,0197
LINK 7860 780A
LINKH 0184 7800
LLIM1 7866 7830,783F
LLIM2 7867 7829,782B,7833,7844
LOWRL 7868 7831,7841
LWRLH 018C 0184,0194
ODD 7857 7852,7856
ODDH 01AA 01A5,01A9
ONE 7869 7834
ONEH 018D 0187
PATNH 018E
PATND 786A
PAT01 783A
PAT02 783D 7838,783C
PAT1H 018D
PAT2H 0190 018B,018F
PLOC 786B 7840,7845,784D,7854,7857,7859
PLOC 018F 0193,0198,01A0,01A7,01AA,01AC
RDSWH 0186 0189
RDSWS 7862 7805,7836
SIZE 786C 7815,7816,7822,7826,782A,782D,7832
SIZEH 01C0 0168,0169,0175,0179,017D,0180,0185
START 780D 784A,7860,786F
STRTH 0160 019D,0184,01C3,7808
SWS 7871 7806,7837,7862
SWSH 01C5 018A,0186
TEMP 786D 784F,7851
TEMPH 01C1 01A2,01A4
TWO 786E
TWOH 01C2
ULIM1 786F 782C,782E,782F
ULM1H 01C3 017F,0181,0182
UPERL 787D 7835,7846
UPRLH 01C4 0188,0199
WAIT2 7849
WAIT3 019C

END OF ASSEMBLY

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

NOTE - THE FOLLOWING OPERATING PROCEDURE AND FUNCTIONAL DESCRIPTION IS APPLICABLE TO BOTH THE 1442 RELOCATING LOADER (03AA - 2191283) AND THE 2501 RELOCATING LOADER (03AB - 2196461)

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1. PURPOSE

THE 1130 RELOCATING DIAGNOSTIC LOADER IS USED TO LOAD THE DIAGNOSTIC MONITOR AND PROGRAMS WHICH RUN UNDER CONTROL OF THE DIAGNOSTIC MONITOR. THE LOADER ALSO LOADS NON-MONITOR PROGRAMS WHOSE OBJECT DECKS ARE IN THE SAME FORM AS THE OUTPUT OF THE 1130 ASSEMBLER (12-4 FORMAT). (THE 1130 RELOCATING DIAGNOSTIC LOADER WILL NOT LOAD PROGRAMS WHOSE OBJECT DECKS ARE COMPATIBLE WITH THE 1130 BASIC DIAGNOSTIC LOADER)

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES.

THIS LOADER USES THE FIRST 340 WORDS OF STORAGE.

2.2 EQUIPMENT PREREQUISITES

1. 1130 CPU
2. PROGRAM LOAD FROM 2501 OR 1442

3. OPERATING PROCEDURE

THE FOLLOWING PROCEDURE IS APPLICABLE TO BOTH THE 1442 RELOCATING LOADER (03AA) AND THE 2501 RELOCATING LOADER (03AB).

3.1 TYPES OF PROGRAMS THAT MAY BE LOADED.

THE RELOCATING DIAGNOSTIC LOADER IS DESIGNED PRIMARILY FOR LOADING THE 1130 DIAGNOSTIC MONITOR II AND RELOCATABLE DIAGNOSTIC PROGRAMS WHICH RUN UNDER CONTROL OF MONITOR II. THE FOLLOWING TYPES OF PROGRAMS CAN ALSO BE LOADED USING THIS LOADER.

1. ANY ABSOLUTE PROGRAM ASSEMBLED IN THE STANDARD 1130 ASSEMBLY FORMAT SO LONG AS THAT PROGRAM DOES NOT LOAD INTO ANY CORE LOCATIONS LOWER THAN /160.
2. ANY RELOCATABLE PROGRAM.
3. A HEXIDECIMAL OBJECT DECK OR HEXADECIMAL PATCH CARDS PUNCHED IN THE FORMAT DESCRIBED IN SECTION 5.2 SUCH PROGRAMS CAN LOAD INTO ANY CORE LOCATIONS ABOVE /160, OR (TO LOAD INTO ZERO USE ADDRESS 8000). IF THE PROGRAM IS LOADED WITH INTERRUPT DELAY ON IT MAY BE LOADED INTO CORE LOCATIONS 0-39. THIS ALLOWS INTERRUPT TRANSFER VECTORS TO BE SET DURING LOADING. ALSO INDEX REGISTERS ARE NOT USED BY THE HEX LOADER, THEREFORE, THESE MAY BE SET DURING LOADING. THIS FACILITY ALLOWS MANY PRESENTLY WRITTEN KEY IN ROUTINES TO BE PUNCHED INTO CARDS AND LOADED WITH VERY LITTLE MODIFICATION TO THESE ROUTINES.

3.2 TO LOAD A PROGRAM-

1. AT CARD READER

- A. DEPRESS NPRO PUSHBUTTON TO EJECT ANY CARDS LEFT IN MACHINE.
- B. PLACE RELOCATING LOADER IN FRONT OF DECK(S) TO BE LOADED AND PLACE CARDS IN HOPPER.
- C. DEPRESS START PUSHBUTTON. READY INDICATOR SHOULD LIGHT.

2. AT 1131 CONSOLE

- A. SET DATA ENTRY SWITCHES AS REQUIRED BY PROGRAM TO BE LOADED.
- B. DEPRESS RESET PUSHBUTTON.
- C. DEPRESS PROGRAM LOAD PUSHBUTTON. (PROGRAM SHOULD LOAD)

3. TRANSFER TO PROGRAM

- A. IF THE PROGRAM DECK IS TERMINATED BY A BLANK CARD, THE LOADER WILL AUTOMATICALLY TRANSFER TO THE ADDRESS ON THE END OF PROGRAM CARD.
- B. IF THERE IS NO BLANK CARD ON THE END OF THE DECK, THE CARD READER WILL GO NOT READY AND THE LOADER WILL STOP AT WAIT 30F8. TO CONTINUE, PRESS READER START THEN 1131 START.

3.3*** PROGRAM HALTS

HALT NO. (B REG)	DESCRIPTION	RESTART ACTION
30F1	CHECK SUM ERROR ON FIRST CARD OF LOADER	RELOAD
30F2	READER DSW ERROR WHEN LOADING LOADER	RELOAD
30F3	CARD 2 OF LOADER DID NOT LOAD	RELOAD
30F4	CAN NOT CLEAR CORE - DUE TO ERROR IN ADDRESSING UPPER CORE.	
30F5	READER CHECK WHEN LOADING MONITOR OR TEST PROGRAM	NPRO THEN PLACE CARDS RUN OUT IN FRONT OF REMAINING DECK AND PRESS START.
30F6	PROGRAM DID NOT LOAD	RELOAD
30F7	CHECK SUM WHEN LOADING PROGRAM	RELOAD
30F8	READER NOT READY	MAKE READER READY

4. PRINTOUTS (NONE)

5. COMMENTS

5.1*** THE FOLLOWING ARE THE MAJOR ELEMENTS OF THE 1130 RELOCATING DIAGNOSTIC LOADER-

- 5.1.1 BOOTSTRAP ROUTINE -- IS A SET OF INSTRUCTIONS ENTERED INTO THE 1130 CPU CONTROLLED BY THE IPL (INITIAL PROGRAM LOADER) MODE WHOSE FUNCTION IS TO READ IN THE REMAINDER OF THE LOADER.
- 5.1.2 READ ROUTINE -- CHECKS READER FOR PROPER STATUS, READS A CARD INTO LOCATION /0028 THROUGH /0078, CHECKS FOR SATISFACTORY COMPLETION OF THE READ OPERATION, AND DETERMINES WHETHER THE CARD READ IS A BINARY CARD OR A HEXADECIMAL CARD.
- 5.1.3 BINARY PACK ROUTINE -- COMPUTES CHECKSUM OF A BINARY CARD, WAITS IF CHECKSUM IS IN ERROR.
- 5.1.5 MOVE ROUTINE -- MOVES DATA FROM /0028 THROUGH /0050 TO PROPER CORE LOCATION. CHECKS FOR EXCEEDING CORE SIZE. ADDS IN RELOCATION FACTOR WHEN REQUIRED.

- 5.1.6 RELOCATABLE HEADER ROUTINE -- ENTERED WHEN A RELOCATABLE HEADER CARD IS FOUND. COMPUTES A RELOCATION FACTOR FOR PROGRAM THAT FOLLOWS.
- 5.1.7 ABSOLUTE HEADER ROUTINE -- ENTERED WHEN AN ABSOLUTE HEADER CARD IS FOUND. SETS RELOCATION FACTOR TO ZERO.
- 5.1.8 TRANSFER ROUTINE -- ENTERED WHEN A TRANSFER CARD IS FOUND. COMPUTES THE NEXT LOCATION AVAILABLE FOR LOADING IF ANOTHER PROGRAM FOLLOWS. TRANSFERS CONTROL TO THE LOCATION SPECIFIED ON THE TRANSFER CARD.
- 5.1.9 HEX TO BINARY CONVERSION ROUTINE -- CONVERTS A HEXADECIMAL CARD TO BINARY. ADDS IN RELOCATION FACTOR IF REQUIRED.

5.2*** CARD FORMAT

THE FOLLOWING DESCRIBES THE FORMAT OF CARDS WHICH CAN BE LOADED BY THE 1130 RELOCATING DIAGNOSTIC LOADER.

- 5.2.1 ABSOLUTE HEADER CARDS HAVE A 1 PUNCH IN COLUMN 4.
- 5.2.2 RELOCATABLE HEADER CARDS HAVE A 0 (ZERO) PUNCH IN COLUMN 4.
- 5.2.3 NORMAL DATA CARDS HAVE NO PUNCHES IN ROW 12 IN COLUMN 1. AN ADDRESS IN ROWS 11 THROUGH 9 IN COLUMN 1 AND ROWS 2 AND ROWS 12 THROUGH 5 OF COLUMN 3. A 12, 0 PUNCH IN COLUMN 4, A WORD COUNT IN ROWS 4 THROUGH 9 OF COLUMN 4. A RELOCATION FIELD (WHICH MAY BE BLANK) IN COLUMN 5 THROUGH 12. DATA IN COLUMNS 13 THROUGH 72. A SEQUENCE NUMBER IN COLUMNS 73-80.
- 5.2.4 BINARY TRANSFER CARDS HAVE 12,11,0, 1 PUNCHES IN COLUMN 4 AND A WORD COUNT OF ZERO (NO PUNCHES IN ROWS 4 THROUGH 9 IN COLUMN 4).
- 5.2.5 HEXADECIMAL TRANSFER CARDS HAVE A 12 PUNCH IN COLUMN 1, A TRANSFER ADDRESS IN COLUMN 2 THROUGH 5 AND NO PUNCHES IN COLUMNS 6 AND 7.
- 5.2.6 HEXADECIMAL DATA CARDS HAVE A 12 PUNCH IN COLUMN 1. THE ADDRESS AT WHICH THE DATA IS TO BE LOADED IN COLUMN 2 THROUGH 5 TO LOAD INTO ADDRESS ZERO USE 8000. DATA IN COLUMNS 6 THROUGH 75. DATA IS GROUPED 5 COLUMNS TO ONE CORE WORD. THE FIRST COLUMN OF EACH GROUP SPECIFIES WHETHER OR NOT THE GROUP REQUIRES A RELOCATION FACTOR. IF THE FIRST COLUMN OF A GROUP IS BLANK, A RELOCATION FACTOR WILL NOT BE ADDED. IF THE FIRST COLUMN OF A GROUP CONTAINS AN R (11,9 PUNCH) A RELOCATION FACTOR WILL BE ADDED TO THE FIELD. LOADING OF THE CARD IS TERMINATED BY TWO SEQUENTIAL BLANK COLUMNS. COLUMNS 76 AND 77 MUST BE BLANK. A SEQUENCE NUMBER MAY BE PUNCHED IN COLUMNS 78-80. ALSO IF ONLY A PORTION OF THE CARD IS USED FOR DATA AFTER TWO BLANK COLUMNS ANY COMMENT MAY BE ADDED TO THE CARD.

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

```
0000 ABS 3AA00020
      ORG /0000 3AA00030
*----- 1130 LOADER CARD 1 -----
* LOAD WITH PROGRAM LOAD BUTTON
0000 0 C02C START LD RDIN&1 CORRECT I/O CONT. COMM. 3AA00070
0001 0 1802 SRA 2 BY SHIFTING 3AA00080
0002 0 D02A STO RDIN&1 3AA00090
0003 0 C023 LD STRD CORRECT I/O CONT. COMM. 3AA00100
0004 0 1801 SRA 1 BY SHIFTING AND 3AA00110
0005 0 D021 STO STRD STORE WORD 3AA00120
0006 0 F038 EOR STORE SET UP STORE LONG INST 3AA00130
0007 0 D037 STO STORE PUT BACK INTO CORE. 3AA00140
0008 0 C022 LD SENSE CORRECT I/O CONT. COMM. 3AA00150
0009 0 1803 SRA 3 3AA00160
000A 0 D020 STO SENSE 3AA00170
000B 0 F01D EOR RESET 3AA00180
000C 0 D01C STO RESET 3AA00190
000D 0 1805 SRA 5 MAKE STORE LONG INST. 3AA00200
000E 0 F031 EOR STORE&1 3AA00210
000F 0 D030 STO STORE&1 3AA00220
0010 0 C017 LD INTAD 3AA00230
0011 0 D0F6 STO /0008 3AA00240
0012 0 D0F9 STO /000C 3AA00250
*
0013 0 C016 STRT LD CHKSM FORM CHECK SUM ,THIS CARD 3AA00270
0014 0 8000 A * FROM 0015 THRU 004D 3AA00280
0015 0 D014 STO CHKSM 3AA00290
0016 0 C0FD LD STRT&1 3AA00300
0017 0 800E A K0001 MODIFY ADD INSTRUCTION 3AA00310
0018 0 D0FB STO STRT&1 3AA00320
0019 0 F00B EOR CON1 CHECK THAT LAST LOC.CHECKD 3AA00330
001A 0 4820 BSC Z SKIP WHEN DONE 3AA00340
001B 0 70F7 MDX STRT GO GET NEXT WORD 3AA00350
001C 0 C00D LD CHKSM GET SUM OF 0013 THRU 004F 3AA00360
001D 0 4820 BSC Z -- SEE ACC IS 0000 IF SO GO 3AA00370
001E 0 30F1 WAIT -15 CHECK SUM ERROR 3AA00380
001F 0 7010 ENDCK MDX SRTRD START LOADING 3AA00390
*
0020 0 B823 INT DC /B823 3AA00400
0021 0 0806 XIO RESET-1 SENSE AND RESET DSW 3AA00410
0022 0 48F8 DC /48F8 BOSC &-Z 3AA00420
0023 0 0803 K0803 DC /0803 3AA00430
0024 0 700E MDX PACK 3AA00440
*
0025 0 8039 CON1 A X /0039 3AA00450
0026 0 0001 K0001 DC /0001 START RD,USED AS CONSTANT 3AA00460
0027 0 2808 STRD DC /2808 /1404 SET BY PROG. 3AA00470
0028 0 0020 INTAD DC INT RESET DSW CONTROL COMMAND 3AA00480
0029 0 0003 RESET DC /0003 /1703 SET BY PROGRAM 3AA00490
002A 0 3829 CHKSM DC /3829 SENSE DSW CONTROL COMMAND 3AA00500
002B 0 8800 SENSE DC /B800 /1700 SET BY PROGRAM 3AA00510
002C 0 0000 RDIN DC /0000 READ IN LOCATIONS 0&1 3AA00520
002D 0 4800 DC /4800 /1200 SET BY PROGRAM 3AA00530
*
002E 0 F017 ERROR EDR K0800 RESTORE ACC. TO DSW 3AA00540
002F 0 30F2 WAIT -14 **ERR. DSW IN ACC. 3AA00550
*
0030 0 08F5 SRTRD XIO STRD-1 START READ 3AA00560
0031 0 08F6 XIO RESET-1 RESET DSW 3AA00570
0032 0 08F7 XIO SENSE-1 SENSE DSW FOR CRP 3AA00580
0033 0 F011 PACK EOR K8003 BITS 0 & 14 & 15 ONLY 3AA00590
0034 0 4820 BSC Z SKIP IF BITS 0&14&15 ONLY 3AA00600
0035 0 7011 MDX CONT1 CONTINUE DSW ANALYSIS 3AA00610
0036 0 08F5 XIO RDIN RD COL. ONE-HALF WORD 3AA00620
0037 0 C0F4 LD RDIN 3AA00630
0038 0 F0ED EOR K0001 SWITCH READ IN AREA, EVEN 3AA00640
0039 0 D0F2 STO RDIN COLS. IN 0 ODD IN 1 3AA00650
```

```
003A 0 4820 BSC Z SKIP BOTH HALVES IN 3AA00700
003B 0 70F5 MDX SRTRD&1 GET 2ND HALF WORD 3AA00710
003C 0 C0C4 LD START&1 GET LAST 8 BITS 3AA00720
003D 0 1808 SRA 8 SHIFT IT 3AA00730
003E 0 F0C1 EOR START GET FIRST 8 BITS 3AA00740
003F 0 C004 STORE DC /C004 FIRST WORD OF STO L 3AA00750
0040 0 00F7 DC /00F7 2ND WORD OF STORE LONG 3AA00760
* STORE & STORE &1 CHANGED BY PROG9 TO STO L /004F 3AA00770
LD STORE&1 3AA00780
A K0001 MODIFY STORE ADDRESS 3AA00790
STO STORE&1 3AA00800
MDX SRTRD&1 3AA00810
*
K8003 DC /8003 3AA00820
K0800 DC /0800 3AA00830
*
CONT1 EOR K8000 CHECK FOR BITS 14&15 ONLY 3AA00840
BSC Z SKIP BUSY AND NOT READY 3AA00850
MDX CONT2 3AA00860
MDX SRTRD&2 3AA00870
K8000 DC /8000 3AA00880
*
CONT2 EOR K0803 CHECK FOR BIT 4 ONLY 3AA00890
BSC Z SKIP END OF CARD 3AA00900
MDX ERROR 3AA00910
WAIT -13 **ERR IF PRGM STOPS AT WAIT 3AA00920
*
***** 3AA00930
* 3AA00940
* CARD TWO STARTS HERE 3AA00950
* 3AA00960
* 3AA00970
* 3AA00980
* 3AA00990
* 3AA01000
* 3AA01010
* INPUT EQU /28 INPUT AREA 3AA01020
* 3AA01030
* NOTE..... THIS SECTION OVERLAYED..... 3AA01040
* BY READING THE FIRST CARD.. 3AA01050
* OF FIRST PROGRAM..... 3AA01060
* 3AA01070
* 3AA01080
* 3AA01090
* 3AA01100
* 3AA01110
* 3AA01120
* 3AA01130
* 3AA01140
* 3AA01150
* 3AA01160
* 3AA01170
* 3AA01180
* 3AA01190
* 3AA01200
* 3AA01210
* 3AA01220
* 3AA01230
* 3AA01240
* 3AA01250
* 3AA01260
* 3AA01270
* 3AA01280
* 3AA01290
* 3AA01300
* 3AA01310
* 3AA01320
* 3AA01330
* 3AA01340
* 3AA01350
* 3AA01360
* 3AA01370
```

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```

0073 0 700A          MDX  RDCD    GO LOAD PROGRAM      3AA01380
*                   *                   *                   *
0074 0 0000          FIRST DC  *-*                   3AA01390
0075 0 0007          COUNT DC   7                    3AA01400
*                   *                   *                   *
0076                ORG      /78                    3AA01410
*                   *                   *                   *
*****
*                   *                   *                   *
*                   *                   *                   *
* THIS LOADER READS DATA FROM A CARD AND STORES      3AA01420
* THAT DATA IN LOCATIONS /40 TO /77                  3AA01430
*-----*-----*-----*-----*-----*-----*
*                   *                   *                   *
0078 0 082D          LOAD  XIO    SENSN-1             3AA01440
0079 0 4C04 0156     BSC  L  MLCD,E                 3AA01450
007B 0 C02A          LD      INTE                    3AA01460
007C 0 D300          STO    3 0                      3AA01470
007D 0 D33E          STO    3 /3E                    3AA01480
*                   *                   *                   *
RDCD  LD            DSW      CK LAST CARD SW         3AA01490
SLA  3              3AA01500
007E 0 C029          RDCD1 LD      FEED,&Z           3AA01510
007F 0 1003          LD      ADRS                    3AA01520
0080 0 4C28 0155     BSC  L  FEED,&Z           GO TO MONITOR IF ON 3AA01530
0082 0 C022          LD      ADRS                    SET INPUT ADRS     3AA01540
0083 0 D028          STO    READ                    3AA01550
0084 0 D02A          STO    DATA                    3AA01560
*                   *                   *                   *
XIO    SENSR-1     SENSE DSM FOR READY              3AA01570
BOSC  E            SKIP IF READY                    3AA01580
WAIT  -8           WAIT $30F8 IF NOT READY          3AA01590
*                   *                   *                   *
XIO    STRD1-1     START READ                       3AA01600
*                   *                   *                   *
RDCD2 XIO    SENSR-1  RESET DSM                     3AA01610
BOSC  &-Z         3AA01620
*                   *                   *                   *
INTO  DC          *-*      SERVICE COLUMN INTERRUPT 3AA01630
RDCD3 XIO    SENSN-1  SENSE DSM FOR READY           3AA01640
EOR    K0003      3AA01650
BSC  L  RDCD3,&-  LOOP UNTIL CHANGE IN DSM          3AA01660
*                   *                   *                   *
RTE    13         LOOK AT ERR IND                   3AA01670
BSC  L  W30F5,E  BR IF ON                           3AA01680
SLT   2           3AA01690
BSC  L  OPCOM,E  BR IF OP COMPLETE                 3AA01700
SLA   11          3AA01710
BSC  L  RDCD3,-  BR IF NO INTRPT RESPONSE          3AA01720
XIO    READ       READ COLUMN                       3AA01730
MDX  L  READ,&1  UPDATE READ IN AREA               3AA01740
MDX  RDCD2       3AA01750
*                   *                   *                   *
OPCOM XIO    SENSR-1  RESET DSM                     3AA01760
STO    DSW      SAVE DSM                           3AA01770
LD      INPUT    3AA01780
SLA    1         3AA01790
BOSC  L  HEX,C&- BR IF HEX PATCH CARD             3AA01800
BOSC  L  SB05    3AA01810
*                   *                   *                   *
ADRS  DC          INPUT                             3AA01820
BSS   E          3AA01830
INTE  DC          INTO                             3AA01840
SENSE DC /1700   INTERRUPT TRANSFER ADRES          3AA01850
DSW   DC *-*     SENSE - NO RESET                  3AA01860
SENSE DC /1703   OP COMPLETE DSW                  3AA01870
K0003 DC /0003   SENSE RESET                       3AA01880
STRD1 DC /1404   START READ COMMAND                3AA01890
READ  DC *-*     READ ONE COL COMMAND              3AA01900
DC    /1204     3AA01910
*                   *                   *                   *

```

RELOCATING LOADER - 1442

```

00AE 0 0001          ONE  DC    1                    3AA02060
00AF 0 0000          DATA DC  *-*                   3AA02070
00B0 0 1084          SL    SLT   4                    3AA02080
00B1 0 1088          SLT   8                    3AA02090
00B2 0 108C          SLT  12                    3AA02100
*                   *                   *                   *
*****
*                   *                   *                   *
*                   *                   *                   *
* THIS RT PACKS BINARY DATA AND LEAVES IT IN         3AA02110
* LOCATIONS 0028 - 0078.                             3AA02120
*-----*-----*-----*-----*-----*-----*
*                   *                   *                   *
SB05  LDX  1 -72   3AA02130
LDX  3 0          3AA02140
SB06  LDX  2 -3   3AA02150
SB07  LD   L2 SL&3 3AA02160
STO   SB10        3AA02170
LD    1 INPUT&73 LD INPUT DATA                    3AA02180
RTE   16          3AA02190
LD    1 INPUT&72 LD REST OF WORD                    3AA02200
SRA   4          3AA02210
SB10  SLT  *-*     REQUIRED SHIFT SET HERE           3AA02220
STO   3 INPUT    STO CONVERTED WORD                 3AA02230
MDX  3 1         3AA02240
MDX  1 1         3AA02250
MDX  2 1         3AA02260
MDX  SB07        CONVERT NEXT WORD                  3AA02270
MDX  1 1         3AA02280
MDX  SB06        SKIP WHEN FINISHED                3AA02290
*                   *                   *                   *
*****
*                   *                   *                   *
*                   *                   *                   *
* THIS RT DETERMINES WHETHER THE DATA CARD IS       3AA02300
* 1# ABSOLUTE HDR CARD 2# RELOCATABLE HDR CARD       3AA02310
*-----*-----*-----*-----*-----*-----*
*                   *                   *                   *
LD    1 INPUT&2   CK FOR HDR CARDS                  3AA02320
BSC  L  MLCD,&-  BR TO USER - BLANK CD              3AA02330
AND  LB20        3AA02340
S    LB25        3AA02350
BSC  L  ABHED,&- BCH IF ABSOL HEAD CARD             3AA02360
S    LB25        3AA02370
BSC  L  RLHED,&- BCH IF RELOC HEAD CARD             3AA02380
*                   *                   *                   *
*****
*                   *                   *                   *
*                   *                   *                   *
* THIS ROUTINE ADDS COLUMNS 0 - 72                   3AA02390
* TO CHECK THAT THIS SUM PLUS THE CARD                3AA02400
* SEQUENCE NUMBER EQUALS ZERO .                       3AA02410
*-----*-----*-----*-----*-----*-----*
*                   *                   *                   *
LD    1 INPUT&1   LD CHECK SUM                      3AA02420
BSC  L  CKEOP,&- SKIP CKSUM IF ZERO                 3AA02430
*                   *                   *                   *
LD    CDCT       3AA02440
LDX  2 -54       3AA02450
CKSM1 A  2 INPUT&54 ADD WORDS 1 TO 54              3AA02460
BSC  C          3AA02470
A    ONE        3AA02480
MDX  2 1        3AA02490
MDX  CKSM1      3AA02500
*                   *                   *                   *
A    ONE        3AA02510
BSC  L  CKSUM,Z BR IF CK SUM ERR                    3AA02520
*                   *                   *                   *

```



```
00DC 0 7401 0103      MDX L CDCT,1  ADD 1 TO CARD CT      3AA02740
*-----*
* CHECK FOR END OF PROGRAM CARD                    3AA02750
*-----*
* CKEOP LD      1 INPUT&2  GET WORD COUNT          3AA02760
00DE 0 C12A          SLA      8      CLEAR CARD CODE  3AA02770
00DF 0 1008          SRA      8      3AA02780
00E0 0 1808          STO      1 INPUT&2  SAVE WORD COUNT  3AA02790
00E1 0 D12A          BSC L  EOP,&-  EOP IF WC # ZERO  3AA02800
00E2 0 4C18 010C      *-----*
* CHECK FOR OVER CORE                              3AA02810
*-----*
* A      1 INPUT      SUM WC&STO ADDR&RELOC        3AA02820
00E4 0 8128          A      UPPER
00E5 0 8077          S      ULIM
00E6 0 9078          BSC L  OVCR,-  BR IF OVER CORE  3AA02830
00E7 0 4C10 015A      *-----*
* RELOCATE AND STORE                               3AA02840
*-----*
* THIS RT PLACES DATA FIELDS INTO THE CORRECT    3AA02850
* CORE LOCATIONS AND ADDS IN A RELOCATION          3AA02860
* FACTOR IF REQUIRED.                              3AA02870
*-----*
* LD      1 INPUT      LD STORE ADDR&S            3AA02880
00E9 0 C128          A      UPPER      RELOCATE STORE ADDR&S  3AA02890
00EA 0 8072          STO      STOR4&1
00EB 0 D008          LDX L2 INPUT&3  XR2 # RELOCATION CODE ADDR&S  3AA02900
00EC 0 6600 002B      *-----*
* STOR1 LDX      3 -8      XR3# REL BIT CNT        3AA02910
00EE 0 63F8          *-----*
* LD      2 0          LD NEXT RELOCATION CODE      3AA02920
00EF 0 C200          RTE      16      STO IN EXT REG      3AA02930
00F0 0 18D0          STOR2 SLT      2      BRING IN NEXT REL BIT  3AA02940
00F1 0 1082          BSC L  STOR6,E  BR IF RELOCATE  3AA02950
00F2 0 4C04 0101      *-----*
* SRA      16
00F4 0 1810          STOR3 A      1 INPUT&9  ADD NEXT WORD      3AA02960
00F5 0 8131          STOR4 STO L1 *-*  STO IN PROGRAM      3AA02970
00F6 0 D500 0000      MDX L  INPUT&2,-1  DECR WORD CNT      3AA02980
00F8 0 74FF 002A      MDX      STOR5      SKIP WHEN WC # 0      3AA02990
00FA 0 7001          LDX      RDCD      FINISHED          3AA03000
00FB 0 607E          *-----*
* STOR5 MDX      1 1      ADV WORD AND STO ADR&S    3AA03010
00FC 0 7101          MDX      3 1      ADV REL BIT CNT    3AA03020
00FD 0 7301          MDX      STOR2      3AA03030
00FE 0 70F2          MDX      2 1      ADV TO NXT RELOC WD  3AA03040
00FF 0 7201          MDX      STOR1      3AA03050
0100 0 70ED          *-----*
* STOR6 LD      UPPER      LD RELOC FACTOR          3AA03060
0101 0 C05B          MDX      STOR3      GO RELOC ADDR&S    3AA03070
0102 0 70F2          *-----*
* CDCT DC      *-*
0103 0 0000          LB20 DC      /0F00
0104 0 0F00          LB25 DC      /0100
0105 0 0100          *-----*
* HEADER AND EOP CARDS
*-----*
* THIS RT. HANDLES RELOCATABLE HDR CARDS.
*-----*
```

```
0106 0 C055          RLHED LD      NLOC      COMPUTE RELOC FACTOR  3AA03420
0107 0 9056          S      RLBA
*-----*
* THIS RT. HANDLES ABSOLUTE HDR CARDS.
*-----*
* ABHED STO      UPPER
0108 0 D054          MDX      1 1      INITIALIZE CARD COUNT  3AA03430
0109 0 7101          STX      1 CDCT
010A 0 69F8          LDX      RDCD
010B 0 607E          *-----*
* THIS ROUTINE HANDLES END OF PROGRAM CARDS
*-----*
* EOP LD      1 INPUT
010C 0 C128          A      UPPER
010D 0 804F          STO      NLOC      SET NEXT AVAIL LOC  3AA03440
010E 0 D04D          LD      1 INPUT&3  LD TRANSFER ADDR&S  3AA03450
010F 0 C12B          A      UPPER
0110 0 804C          STO      EOP1&1
0111 0 D001          EOP1 BSC L  *-*  TRANSFER TO PROGRAM  3AA03460
0112 0 4C00 0000      *-----*
* HEX DATA ROUTINE
*-----*
* THIS ROUTINE CONVERTS HEX CORRECTION
* DATA TO BINARY AND STORES THE DATA.
*-----*
* HEX STO      HE22&1  CLEAR STORE ADDR&S  3AA03470
0114 0 D032          HEX1 LD      I DATA  LOAD RELOCATION BIT  3AA03480
0115 0 C480 00AF      STO      RLREQ      STO RELOCATION BIT  3AA03490
0117 0 D038          MDX L  DATA,1  ADV TO NXT WORD  3AA03500
0118 0 7401 00AF      *-----*
* CONVERT HEX TO BINARY
*-----*
* HE10 LD      FOUR
011A 0 C031          STO      INDX1
011B 0 D032          SRA      16
011C 0 1810          HE11 SLA      4
011D 0 1004          STO      TEMP
011E 0 D02C          SRA      16
011F 0 1810          STO      INDX2
0120 0 D02E          LD      I DATA  CK FOR BLANK COLUMN  3AA03510
0121 0 C480 00AF      BSC L  RDCD,&-  FINISHED - LOAD NEXT CARD  3AA03520
0122 0 7401 0132      *-----*
* BSC L  HE11A,-  BR IF NOT A-F  3AA03530
0123 0 4C18 007E      MDX L  INDX2,9  ADD 9 FOR ALPHA  3AA03540
*-----*
* HE11A SLA      3      ELIMINATE ZONE BITS  3AA03550
0129 0 1003          BSC L  HE14,&-  XFER IF HEX CHAR # 0  3AA03560
012A 0 4C18 0133      MDX L  INDX2,1
012C 0 7401 014F      BSC L  HE13,&Z  XFER IF BIT IS FOUND  3AA03570
012E 0 4C28 0132      SLA      1      PREPARE TO LK AT NEXT BIT  3AA03580
0130 0 1001          MDX      HE12-2
0131 0 70FA          *-----*
* HE13 LD      INDX2  LOAD BINARY BITS  3AA03590
0132 0 C01C          HE14 OR      TEMP  ADD TO PREVIOUS CHARS  3AA03600
0133 0 E817          MDX L  DATA,1
0134 0 7401 00AF      MDX L  INDX1,-1
0136 0 74FF 014E      MDX      HE11
0138 0 70E4          *-----*
* FINISHED - CONVERTED WORD IN ACCUMULATOR
```

RELOCATING LOADER - 1442

RELOCATING LOADER - 1442

```

0139 0 7400 0147 * MDX L HE22&1,0 SKIP IF STO ADRS 3AA04100
0138 0 7007 MDX HE21 BR IF DATA 3AA04110
* 3AA04120
013C 0 8020 A UPPER RELOC STO ADRS 3AA04130
013D 0 D009 STO HE22&1 3AA04140
013E 0 C400 002E LD L INPUT&6 LD NXT WORD 3AA04150
0140 0 4C98 0147 BSC I HE22&1,&- BR TO ADRS IF BLANK 3AA04160
0142 0 70D2 MDX HEX1 CONV NXT WORD 3AA04170
* 3AA04180
HE21 MDX L RLREQ,0 SKIP IF NO RELOCATE 3AA04190
0143 0 7400 0150 A UPPER 3AA04200
0145 0 8017 HE22 STO L *- STORE DATA 3AA04210
0146 0 D400 0000 MDX L HE22&1,1 ADV STO ADRS 3AA04220
0148 0 7401 0147 MDX HEX1 CONV NXT WORD 3AA04230
* 3AA04240
* 3AA04250
* 3AA04260
014B 0 0000 TEMP DC *- TEMP STORAGE 3AA04270
014C 0 0000 BSS E 0 3AA04280
014D 0 0004 FOUR DC 4 3AA04290
014E 0 1402 FDCD DC /1402 FEED CARD 3AA04300
014F 0 0000 INDX1 DC *- 3AA04310
0150 0 0000 INDX2 DC *- 3AA04320
0151 0 1000 RLREQ DC *- HEX RELOCATION BITS 3AA04330
0152 0 1000 NOP 3AA04340
* 3AA04350
* 3AA04360
0153 0 30F5 W30F5 WAIT -11 1442 ERROR IND ON 3AA04370
0154 0 607E LDX RDCD TRY REREADING THE CARD 3AA04380
* 3AA04390
0155 0 08F6 FEED XIO FDCD-1 FEED OUT LAST CARD 3AA04400
* 3AA04410
***** 3AA04420
* MONITOR/LOADER INTERFACE 3AA04430
***** 3AA04440
* THE FOLLOWING MUST BE LOCATED IN CORE 3AA04450
* LOCATIONS /0156-/015F. 3AA04460
*----- 3AA04470
* 3AA04480
0156 0 30F6 MLCD WAIT -10 PROGRAM SHOULD PLACE HERE 3AA04490
0157 0 70FE MDX MLCD A XFER ON BLANK CARD 3AA04500
0158 0 30F7 CKSUM WAIT -9 CHECK SUM ERROR 3AA04510
0159 0 70FE MDX CKSUM 3AA04520
015A 0 3000 OVCR WAIT EXCEEDED CORE SIZE 3AA04530
015B 0 70FE MDX OVCR 3AA04540
015C 0 0160 NLOC DC /160 NEXT AVAILABLE STORAGE LOC 3AA04550
015D 0 0000 UPPER DC *- RELOCATION FACTOR 3AA04560
015E 0 0000 RLBA DC 0000 BASE ADDRESS 3AA04570
015F 0 0001 ULIM BSS 1 CORE SIZE 3AA04580
***** 3AA04590
0160 0000 END BSS E 0 3AA04600
0160 0078 END LOAD 3AA04610
NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

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C R O S S R E F E R E N C E
NAME VALUE REFERENCES
ABHED 0108 00CA
ADRS 00A5 0082
CDCT 0103 00D2,00DC,010A
CHKSM 002A 0013,0015,001C
CKEOP 00DE 00D0
CKSM1 00D4 00D8
CKSUM 0158 00DA,0159
CNT 0055 0051
CONT1 0047 0035
CONT2 004C 0049
CON1 0025 0019
CORE 005D
CORE2 0062 0067
CORE3 0071 006A
COUNT 0075 0057
DATA 00AF 0084,0115,0118,0121,0134
DSW 00A8 007E,009E
END 0160 0060
ENDCK 001F
EOP 010C 00E2
EOP1 0112 0111
ERROR 002E 004E
FDCD 014D 0155
FEED 0155 0080
FIRST 0074 004F,0054
FOUR 014C 011A
HEX 0114 00A1
HEX1 0115 0142,014A
HE10 011A
HE11 011D 0138
HE11A 0129 0125
HE12 012E 0131
HE13 0132 012E
HE14 0133 012A
HE21 0143 013B
HE22 0146 0114,0139,013D,0140,0148
INDX1 014E 011B,0136
INDX2 014F 0120,0127,012C,0132
INPUT 0028 009F,00A5,00B9,00BB,00BE,00C5,00CF,00D4,00DE,00E1,00E4,00E9,00EC
00F5,00F8,010C,010F,013E
INT 0020 0028
INTAD 0028 0010
INTE 00A6 005A,007B
INTO 008B 00A6
K0001 0026 0017,0038,0042
K0003 00AA 008D
K0800 0046 002E
K0803 0023 004C
K8000 0048 0047
K8003 0045 0033
LB20 0104 00C8
LB25 0105 00C9,00CC
LOAD 0078 0160
MLCD 0156 0079,00C6,0157
NLOC 015C 0106,010E
ONE 00AE 00D6,00D9
OPCOM 009D 0094
OVCR 015A 00E7,015B
PACK 0033 0024
RDCD 007E 0073,00FB,010B,0123,0154
RDCD1 0082
RDCD2 0089 009C
RDCD3 008C 008E,0097
RDIN 002C 0000,0002,0036,0037,0039
READ 00AC 0083,0099,009A
RESET 0029 000B,000C,0021,0031

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RLBA 015E 0107
RLHED 0106 00CD
RLREQ 0150 0117,0143
SB05 00B3 00A3
SB06 00B5 00C4
SB07 00B6 00C2
SB10 00BD 00B8
SENSE 002B 0008,000A,0032
SENSN 00A7 0078,008C
SENSR 00A9 0085,0089,009D
SL 00B0 00B6
SRTRD 0030 001F,003B,0044,004A
START 0000 003C,003E
STURE 003F 0006,0007,000E,000F,0041,0043
STOR1 00EE 0100
STOR2 00F1 00FE
STOR3 00F5 0102
STOR4 00F6 00EB
STOR5 00FC 00FA
STOR6 0101 00F2
STRD 0027 0003,0005,0030
STRD1 00AB 0088
STRT 0013 0016,0018,001B
TEMP 014B 011E,0133
ULIM 015F 006C,006E,0071,00E6
UPPER 015D 00E5,00EA,0101,0108,010D,0110,013C,0145
W30F4 0070
W30F5 0153 0091

END OF ASSEMBLY

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1. PURPOSE

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

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

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

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES

1130 BASIC DIAGNOSTIC LOADER.

2.2 EQUIPMENT PREREQUISITES

CARD READER OR PAPER TAPE READER.

3. OPERATING PROCEDURES

3.1 PROGRAM LOADING

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

3.2 PROGRAM OPERATION

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

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

2. IF THE PROGRAM DETECTS NO ERRORS, AND THE AUTOMATIC LOOP RESET MODE IS NOT SELECTED, THE PROGRAM WILL HALT AT WAIT 4. IF A RERUN OF THE PROGRAM IS DESIRED, DEPRESS START.
3. ALL OTHER WAITS AND LOOPS ARE EXPLAINED IN TABLES A, B, AND C OF 3.3.
4. TO GO INTO A SCOPE LOOP AFTER A FAILURE HAS BEEN DETECTED, DEPRESS START. THE SCOPE LOOP IS SET UP FOR A 2 FEED/CYCLE PER SECOND RATE, AND A WAIT AFTER 100 FEED CYCLES HAVE BEEN EXECUTED. THE C.E. HAS AN OPTION TO CHANGE THESE VALVES. (SEE 3.4)

3.3 WAITS AND LOOPS

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

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

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

A. MAKE PROGRAM READ IN DEVICE READY.

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

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

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4. PRINTOUTS (NONE)

5. PROGRAM PHILOSOPHY

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

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

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

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

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

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

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

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

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

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

6. APPENDIX (NONE)

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

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INTERRUPT TEST

```

0000          ABS
0500 0 03A8   ORG   /500
0501 0 1000   DC    /03A8   PID
          BEGIN NOP
          ...
0502 0 300F   WAITF WAIT /F
          *****
          *
          *           WAIT F
          *
          * IF PROGRAM IS BEING RUN BECAUSE AN INTRPT *
          * INDICATOR IS NOT BEING CLEARED, SET COSOLE*
          * ENTRY SWITCHES 4---7 TO IDENTIFY LEVEL AT *
          * FAULT AND SELECT DEVICE TO BE USED IN TEST*
          * MAKE DEVICE READY AND PUSH START.
          *
          * IF PROGRAM IS BEING RUN BECAUSE OF SOME
          * OTHER REASON THAN STATED ABOVE,
          * A. SELECT DEVICE VIA CONSOLE SWITCHES
          *   0---2.
          * B. MAKE DEVICE READY.
          * C. PRESS START.
          * NOTE INITIAL WAIT F , SELECT PROGRAM READ
          * IN DEVICE
          *****
          * INTERRUPT VECTOR SETUP.
          *****
          *
0503 0 6500 0735 MAPIT LDX L1 VEC00
0505 0 6000 0008   STX L1 /0008   LEVEL 0
0507 0 6500 0745   LDX L1 VEC01
0509 0 6000 0009   STX L1 /0009   LEVEL 1
050B 0 6500 0755   LDX L1 VEC02
050D 0 6000 000A   STX L1 /000A   LEVEL 2
050F 0 6500 0765   LDX L1 VEC03
0511 0 6000 000B   STX L1 /000B   LEVEL 3
0513 0 6500 0771   LDX L1 VEC04
0515 0 6000 000C   STX L1 /000C   LEVEL 4
0517 0 6500 078C   LDX L1 VEC05
0519 0 6000 000D   STX L1 /000D   LEVEL 5
051B 0 6500 07DC   LDX L1 BAD12
051D 0 6000 0004   STX L1 /0004   BIT 12 DROPPED
051F 0 6500 07E8   LDX L1 BAD14
0521 0 6000 000E   STX L1 /000E   BIT 14 PICKED
0523 0 6500 07F4   LDX L1 NOADR
0525 0 6000 0000   STX L1 /0000   NO INTERRUPT ADDR
          *
0527 0 7001   MDX   WHICH
          *
0528 0 3001   WAIT1 WAIT 1
          *****
          *
          *           WAIT 1
          *
          * A. SELECT DEVICE VIA CONSOLE SWITCHES
          *   0---2.
          * B. MAKE DEVICE READY.
          * C. PRESS START.
          *
          *****
          *
0529 0 6500 1000 WHICH LDX L1 /1000
052B 0 69FB   STX L1 WAIT1-1
052C 0 0C00 0A68 XID L BITSW   READ BIT SWITCHES
052E 0 C400 0A79 LD L BITS1   LOAD BIT SWITCHES
0530 0 1800   SRA 12   SET UP FOR DEVICE

```

INTERRUPT TEST

```

0531 0 D400 0A7A STO L BITS2
0533 0 1801   SRA 1
0534 0 4C04 05CC BSC L WHAT3,E CHECK FOR 2501
0536 0 1801   SRA 1
0537 0 4C04 05C2 BSC L WHAT2,E CHECK FOR PAPER TAPE
0539 0 1801   SRA 1
053A 0 4C04 05B9 BSC L WHAT1,E CHECK FOR 1442
          *
          *****
          *
          *           WAIT 8
          *
          * NO DEVICE WAS FOUND TO BE SELECTED.
          * MAKE SELECTION AND PRESS START.
          *
          *****
          *
053C 0 3008   WAIT8 WAIT 8 NO DEVICE SELECTED
053D 0 4C00 0529 BSC L WHICH SET UP TO CHK AGAIN
          *
053F 0 0C00 0A68 CKLOP XID L BITSW READ BIT SWITCHES
0541 0 C400 0A79 LD L BITS1 LOAD BIT SWITCHES
0543 0 1808   SRA 8 LEVEL ON CHECK
0544 0 D400 0A7B STO L BITS3 LEVEL CHECK BITS
0546 0 1803   SRA 3 CHECK FOR LEVEL 0 ON
0547 0 4C04 0581 BSC L VECT0,E SET UP LEVEL 0 LOOP
0549 0 C400 0A78 LD L BITS3 LEVEL CHECK BITS
054B 0 4C04 0579 BSC L CKBIT,E NUM OF LEVEL IS ODD
054D 0 1801   SRA 1 CHECK FOR LEVEL 2 ON
054E 0 4C04 0591 BSC L VECT2,E SET UP LEVEL 2 LOOP
0550 0 1801   SRA 1 CHECK FOR LEVEL 4 ON
0551 0 4C04 05A5 BSC L VECT4,E SET UP LEVEL 4 LOOP
0553 0 4C00 06AF BSC L CLR1X NO RESET LOOP SEL.
          *
          *****
          *
          *           WAIT 3F
          *
          * LEVEL RESET LOOP OPTION HAS BEEN CHOSEN.
          * TURN C.E. INTERRUPT SWITCH - OFF. THIS
          * SHOULD SET UP AN AUTOMATIC RESET LOOP FOR
          * DEVICE AND LEVEL SELECTED, FOR SCOPE/WORK.
          *****
          * RESTORE LEVEL RESET LOOP WAITS
          *****
          *
0555 0 6500 3030 GOLOP LDX L1 /3030
0557 0 6000 073A STX L1 MOD13 RESTORE WAIT 30
0559 0 6500 3031 LDX L1 /3031
055B 0 6000 074A STX L1 MOD14 RESTORE WAIT 31
055D 0 6500 3032 LDX L1 /3032
055F 0 6000 075A STX L1 MOD15 RESTORE WAIT 32
0561 0 6500 3033 LDX L1 /3033
0563 0 6000 076A STX L1 MOD16 RESTORE WAIT 33
0565 0 6500 3035 LDX L1 /3035
0567 0 6000 07C1 STX L1 MOD17 RESTORE WAIT 35
          *
          *
          * LD L MOD12&1 SET UP WAIT 1 RETURN
          * STO L MOD13&6
          * STO L MOD14&6
          * STO L MOD15&6
          * STO L MOD16&6
          * STO L MOD17&6
          *
          *
          * LOOPS WAIT /3F
          * BSC L WAIT1 **
          * MDX LOOP5&1
          *
          *
          * CKBIT SRA 1 CHECK FOR LEVEL 3 ON
          * BSC L VECT3,E SET UP LEVEL 3 LOOP
          * SRA 1 CHECK FOR LEVEL 5

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INTERRUPT TEST

INTERRUPT TEST

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057D 0 4C04 05AF      BSC L VECT5,E  SET UP LEVEL 5 LOOP
057F 0 4C00 0587      BSC L VECT1    SET UP LEVEL 1 LOOP
*
0581 0 6500 0732      VECT0 LDX L1 LOOP0&1
0583 0 6D00 0577      STX L1 LOOPS&2 SET LEV LOOP VECTOR
0585 0 4C00 0555      BSC L GOLOP    SET UP,GO TO WAIT 3F
*
0587 0 6500 0742      VECT1 LDX L1 LOOP1&1
0589 0 6D00 0577      STX L1 LOOPS&2 SET LEV LOOP VECTOR
058B 0 6500 0741      LDX L1 LOOP1
058D 0 6D00 0009      STX L1 /0009
058F 0 4C00 0555      BSC L GOLOP    SET UP,GO TO WAIT 3F
*
0591 0 6500 0752      VECT2 LDX L1 LOOP2&1
0593 0 6D00 0577      STX L1 LOOPS&2 SET LEV LOOP VECTOR
0595 0 6500 0752      LDX L1 LOOP2&1
0597 0 6D00 000A      STX L1 /000A
0599 0 4C00 0555      BSC L GOLOP    SET UP,GO TO WAIT 3F
*
059B 0 6500 0762      VECT3 LDX L1 LOOP3&1
059D 0 6D00 0577      STX L1 LOOPS&2 SET LEV LOOP VECTOR
059F 0 6500 0761      LDX L1 LOOP3
05A1 0 6D00 000B      STX L1 /000B
05A3 0 4C00 0555      BSC L GOLOP    SET UP,GO TO WAIT 3F
*
05A5 0 6500 081F      VECT4 LDX L1 LOOP4&1
05A7 0 6D00 0577      STX L1 LOOPS&2 SET LEV LOOP VECTOR
05A9 0 6500 081E      LDX L1 LOOP4
05AB 0 6D00 000C      STX L1 /000C
05AD 0 4C00 0555      BSC L GOLOP    SET UP,GO TO WAIT 3F
*
05AF 0 6500 0789      VECT5 LDX L1 LOOP5&1
05B1 0 6D00 0577      STX L1 LOOPS&2 SET LEV LOOP VECTOR
05B3 0 6500 0788      LDX L1 LOOP5
05B5 0 6D00 000D      STX L1 /000D
05B7 0 4C00 0555      BSC L GOLOP    SET UP,GO TO WAIT 3F
*
05B9 0 0C00 0A5A      WHAT1 XID L SENSE SENSE 1442 READY
05BB 0 4C04 05BF      BSC L NRDYA,E  CHK NOT READY
05BD 0 4C00 05D5      BSC L SET42    SET UP 1442 PROG VEC
*****
* WAIT A *
* 1442 SELECTED AND NOT READY. MAKE IT READY*
* OR SOME OTHER DEVICE SELECTION VIA CONSOLE*
* ENTRY SWITCHES. PUSH START. *
*****
05BF 0 300A          NRDYA WAIT /A SEL 1442/NOT READY
05C0 0 4C00 0529      BSC L WHICH   CHK DEVICE AGAIN
*
05C2 0 0C00 0A5C      WHAT2 XID L SENPT SENSE P.T. READY
05C4 0 180A          SRA L 10
05C5 0 4C04 05C9      BSC L NRDYB,E  CHK NOT READY
05C7 0 4C00 061F      BSC L SET25    SET UP P.T. PROG VEC
*****
* WAIT B *
* P.T. SELECTED AND NOT READY. MAKE IT READY*
* OR SOME OTHER DEVICE SELECTION VIA CONSOLE*
* ENTRY SWITCHES. PUSH START. *
*****
05C9 0 300B          NRDYB WAIT /B SEL P.T./NOT READY
05CA 0 4C00 0529      BSC L WHICH   CHK DEVICE AGAIN
*
05CC 0 0C00 0A5E      WHAT3 XID L SEN25 SENSE 2501 READY
05CE 0 4C04 05D2      BSC L NRDYC,E  CHK NOT READY
05D0 0 4C00 0667      BSC L SET25    SET UP 2501 PROG VEC
*****
* WAIT C *
* 2501 SELECTED AND NOT READY. MAKE IT READY*

```

```

3A801380
3A801390
3A801400
3A801410
3A801420
3A801430
3A801440
3A801450
3A801460
3A801470
3A801480
3A801490
3A801500
3A801510
3A801520
3A801530
3A801540
3A801550
3A801560
3A801570
3A801580
3A801590
3A801600
3A801610
3A801620
3A801630
3A801640
3A801650
3A801660
3A801670
3A801680
3A801690
3A801700
3A801710
3A801720
3A801730
3A801740
3A801750
3A801760
3A801770
3A801780
3A801790
3A801800
3A801810
3A801820
3A801830
3A801840
3A801850
3A801860
3A801870
3A801880
3A801890
3A801900
3A801910
3A801920
3A801930
3A801940
3A801950
3A801960
3A801970
3A801980
3A801990
3A802000
3A802010
3A802020
3A802030
3A802040
3A802050

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05D2 0 300C
05D3 0 4C00 0529
*
05D5 0 6500 0A5A
05D7 0 6D00 06DD
05D9 0 6D00 06EB
05DB 0 6D00 072B
05DD 0 6D00 0737
05DF 0 6D00 0747
05E1 0 6D00 0757
05E3 0 6D00 0767
05E5 0 6D00 0773
05E7 0 6D00 07BE
05E9 0 6D00 07CA
05EB 0 6D00 07DE
05ED 0 6D00 07EA
05EF 0 6D00 07F6
05F1 0 6D00 0803
05F3 0 6D00 080C
*
05F5 0 6580 0A8E
05F7 0 6D00 06DE
*
05F9 0 6580 0A8D
05FB 0 6D00 06EC
05FD 0 6D00 0804
05FF 0 6D00 080D
*
0601 0 6500 0A6C
0603 0 6D00 06F0
*
0605 0 6500 0A87
0607 0 6D00 06FF
0609 0 6D00 0724
*
060B 0 6500 0A84
060D 0 6D00 07AA
*
060F 0 6500 082A
0611 0 6D00 07AC
*
0613 0 3005
0614 0 0C00 0A68
0616 0 4C00 0A79
0618 0 180C
0619 0 9400 0A7A
061B 0 4C18 053F
061D 0 4C00 0529
*
061F 0 6500 0A5C
0621 0 6D00 06DD
0623 0 6D00 06EB
0625 0 6D00 072B
0627 0 6D00 0737

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```

* OR SOME OTHER DEVICE SELECTION VIA CONSOLE*
* ENTRY SWITCHES. PUSH START. *
*****
NRDYC WAIT /C SEL 2501/NOT READY
BSC L WHICH   CHK DEVICE AGAIN
*
SET42 LDX L1 SENSE SET UP 1442 SENSE WD
STX L1 BUSY&1
STX L1 TEST1&3
STX L1 WAITG&2
STX L1 VEC00&2
STX L1 VEC01&2
STX L1 VEC02&2
STX L1 VEC03&2
STX L1 VEC04&2
STX L1 VEC05&2
STX L1 CKDOK&2
STX L1 BAD12&2
STX L1 BAD14&2
STX L1 N0ADR&2
STX L1 DSWCK&3
STX L1 DSWCK&12
*
LDX L1 SRA01 SET UP 1442 BUSY CHK
STX L1 BUSY&2
*
LDX L1 NOP1T SET UP 1442 CONTROLS
STX L1 TEST1&4
STX L1 DSWCK&4
STX L1 DSWCK&13
*
LDX L1 FEED SET UP 1442 X10
STX L1 TEST1&8
*
LDX L1 K100 SET UP 1442 LOOP CNT
STX L1 NUMBR&1
STX L1 NUMCK&1
*
LDX L1 K010 SET UP 1442 GOOD CNT
STX L1 FINSH&1
*
LDX L1 SETUP SET UP 1442 TEST VEC
STX L1 FINSH&3
*****
* WAIT 5 *
* 1442 WAS FOUND READY AND WILL BE THE *
* DEVICE USED IN THE TEST. *
* IF INTERRUPT DELAY SW ON, TURN OFF *
* IF PROGRAM DOES NOT START RUNNING BECAUSE *
* OF A PENDING INTERRUPT, DEPRESS START. *
*****
WAIT 5
1442 SELECTED
XID L BITSW READ BIT SWITCHES
LD L BITS1 LOAD BIT SWITCHES
SRA L 12
S L BITS2 LAST DEVICE SELECTED
BSC L CKLOP,&- CHK FOR LEVEL LOOP
BSC L WHICH NEW DEVICE SELECTED
*
SETPT LDX L1 SENPT SET UP PT SENSE WD
STX L1 BUSY&1
STX L1 TEST1&3
STX L1 WAITG&2
STX L1 VEC00&2

```

```

3A802050
3A802070
3A802080
3A802090
3A802100
3A802110
3A802120
3A802130
3A802140
3A802150
3A802160
3A802170
3A802180
3A802190
3A802200
3A802210
3A802220
3A802230
3A802240
3A802250
3A802260
3A802270
3A802280
3A802290
3A802300
3A802310
3A802320
3A802330
3A802340
3A802350
3A802360
3A802370
3A802380
3A802390
3A802400
3A802410
3A802420
3A802430
3A802440
3A802450
3A802460
3A802470
3A802480
3A802490
3A802500
3A802510
3A802520
3A802530
3A802540
3A802550
3A802560
3A802570
3A802580
3A802590
3A802600
3A802610
3A802620
3A802630
3A802640
3A802650
3A802660
3A802670
3A802680
3A802690
3A802700
3A802710
3A802720
3A802730

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INTERRUPT TEST

```

06E6 0 4C04 0772      BSC L VEC04&1,E SET UP FOR RESTORE
*
06E8 0 6780 0A7F      TEST1 LDX I3 DELAY 500 MSEC DELAY
06EA 0 0C00 0A5A      XIO L SENSE SENSE FOR READY
06EC 0 1000            NOP
06ED 0 4C04 0800      BSC L DSWCK,E CHECK FOR READY
06EF 0 0C00 0A6C      XIO L FEED FEED
*
* *****
* * WAIT 11 *
* * NO INTERRUPTS *
* * WERE GENERATED. *
* * TO CKECK OUT RUN *
* * TRIGGER, PUSH *
* * START *
* *****
06F1 0 3011      RUNCK WAIT /11 NO INTERRUPTS
06F2 0 701A      MOD11 MDX CKRUN SET UP RUN TRIG CHK
06F3 0 73FF      MDX 3 -1 DECREMENT DELAY BY 1
06F4 0 70FE      MDX MOD11&1
06F5 0 6100      LDX 1 0
06F6 0 6D00 0A7C      STX L1 GDCNT RESET GOOD PASS CNTR
06F8 0 4C00 0A7E      LD L LPCNT LOAD LOOP COUNT
06FA 0 8400 0A81      A L ADD01 ADD 1 TO LOOP COUNT
06FC 0 0400 0A7E      STO L LPCNT STORE LOOP COUNT
06FE 0 9400 0A87      S L K100 CHK FOR STOP LOOP
0700 0 4C10 0818      BSC L WAIT2,-
*
* *****
* * WAIT 12 *
* * NO INTERRUPTS *
* * WERE GENERATED. *
* * SETTING OF RUN *
* * TRIGGER APPEARS *
* * NOT TO BE THE *
* * CAUSE OF THE *
* * FAILURE. *
* * TO GO INTO SCOPE *
* * LOOP, PUSH START.*
* *****
0702 0 3012      RUNCK WAIT /12 NO INT-RUN TRIG CKED
0703 0 6500 0771      LDX L1 VEC04
0705 0 6D00 000C      STX L1 /000C SET UP LEVEL 4 VEC
0707 0 6500 1000      LDX L1 /1000 NOP
0709 0 69E7      STX 1 RUNCK SET UP SCOPE LOOP
070A 0 69E7      STX 1 MOD11
070B 0 69F6      STX 1 RUNCK
070C 0 7009      MDX FDCYC BRANCH TO SCOPE LOOP
*
070D 0 6500 1000      CKRUN LDX L1 /1000 SET UP RUN TRIG CHK
070F 0 69E1      STX 1 RUNCK
0710 0 69E1      STX 1 MOD11
0711 0 6500 07C8      LDX L1 CKDOK
0713 0 6D00 000C      STX L1 /000C
0715 0 70C6      MDX BUSY CHECK RUN TRIGGER
*
0716 0 6100      FDCYC LDX 1 0
0717 0 6D00 0A7C      STX L1 GDCNT RESET GOOD PASS CNTR
0719 0 4C00 0999      BSC L CNTCK CHK COUNT OPTION
*
071B 0 73FF      ERROR MDX 3 -1
071C 0 70FE      MDX ERROR STEP DOWN DELAY
071D 0 4C00 0A7E      LD L LPCNT LOAD LOOP COUNT
071F 0 8400 0A83      A L K001 ADD 1 TO LOOP CNT
0721 0 0400 0A7E      STO L LPCNT STORE LOOP CNT
0723 0 9400 0A87      S L K100 CHECK FOR STOP LOOP
0725 0 4C10 0729      BSC L WAITG,- CHECK FOR WAIT 2
0727 0 4C00 0716      BSC L FDCYC FEED AGAIN

```

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3A804100
3A804110
3A804120
3A804130
3A804140
3A804150
3A804160
3A804170
3A804180
3A804190
3A804200
3A804210
3A804220
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3A804240
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3A804680
3A804690
3A804700
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3A804730
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3A804750
3A804760
3A804770

```

INTERRUPT TEST

```

*
*****
* * WAIT 2 *
*
* NORMAL WAIT AFTER DESIRED NUMBER OF LOOPS *
* PASSES HAVE BEEN MADE. PUSH START TO MAKE *
* ANOTHER LOOP CYCLE. *
*****
0729 0 3002      WAITG WAIT 2 STOP SCOPE LOOP
072A 0 0C00 0A5A      XIO L SENSE
072C 0 6100      LDX 1 0
072D 0 6D00 0A7E      STX L1 LPCNT RESET LOOP COUNT
072F 0 4C00 0716      BSC L FDCYC
*
0731 0 0000      LOOP0 DC 0 *****
0732 0 0C00 0A5C      XIO L SENPT * LEVEL 0 AUTO *
0734 0 7001      MDX VEC00&1 * LEVEL RESET LOOP *
* *****
0735 0 0000      VEC00 DC 0 * LEVEL 0 RESET *
0736 0 0C00 0A5A      XIO L SENSE * SCOPE LOOP *
0738 0 4C40 073A      BOSC L MOD13 *****
*
* *****
* * INTERRUPT 0 LEVEL*
* * WAIT 30 *
* * RESET DURING AUTO*
* * SCOPE LOOP. *
* * PUSH START TO GO *
* * TO WAIT 1. *
* *****
073A 0 3030      MOD13 WAIT /30 * WAIT 13 *
* * DROPPED ADDR BIT *
* * 13. PUSH START *
* * FOR SCOPE LOOP *
* *****
073B 0 6580 0A92      LDX I1 MOFYB MDX ERROR
073D 0 6D00 073A      STX L1 MOD13
073F 0 4C00 0503      BSC L MAPIT
*
0741 0 0000      LOOP1 DC 0 *****
0742 0 0C00 0A64      XIO L PRINT * LEVEL 1 AUTO *
0744 0 7001      MDX VEC01&1 * LEVEL RESET LOOP *
* *****
0745 0 0000      VEC01 DC 0 * LEVEL 1 RESET *
0746 0 0C00 0A5A      XIO L SENSE * SCOPE LOOP *
0748 0 4C40 074A      BOSC L MOD14 *****
*
* *****
* * WAIT 31 *
* * INTERRUPT 1 LEVEL*
* * RESET DURING AUTO*
* * SCOPE LOOP. *
* * PUSH START TO GO *
* * TO WAIT 1. *
* *****
074A 0 3031      MOD14 WAIT /31 * WAIT 14 *
* * INTERRUPT CAUSED *
* * A LEVEL 1 ADDR TO*
* * BE GENERATED. *
* * PUSH START FOR *
* * SCOPE LOOP. *
* *****
074B 0 6580 0A93      LDX I1 MOFYC MDX ERROR
074D 0 6D00 074A      STX L1 MOD14

```

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3A804780
3A804790
3A804800
3A804810
3A804820
3A804830
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3A804870
3A804880
3A804890
3A804900
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3A804990
3A805000
3A805010
3A805020
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3A805100
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3A805370
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3A805390
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3A805430
3A805440
3A805450

```



```
* MSEC. AFTER A READS WAS GIVEN. THIS SHOULD*  
* HAVE BEEN ENOUGH TIME TO RECEIVE 80 COLUMN*  
* INTERRUPTS AND AN END OP INTERRUPT. *  
* PUSH START FOR SCOPE LOOP. *  
*****  
0862 0 3021 MOD21 WAIT /21 NO LEV. 0 OR 4 INTRPT  
*  
*****  
* SCOPE LOOP *  
*  
* TO USE SCOPE LOOP, PRESS START. THIS WILL *  
* FEED CARDS AT A 2 CARD/SEC RATE WITH *  
* A HALT AFTER 100 CARDS. *  
* IF AN INTERRUPT IS GENERATED DURING THIS *  
* SCOPE LOOP, A WAIT WILL IDENTIFY IT. *  
* MAKE SURE THERE IS A SUFFICIENT AMOUNT OF *  
* BLANK CARDS IN READER TO ALLOW FURTHER *  
* CHECKING. *  
*****  
0863 0 6100 CARDS LDX 1 0  
0864 0 6000 0A7C STX L1 GDCNT RESET GOOD PASS CNTR  
0866 0 6500 1000 LDX L1 /1000 NOP  
0868 0 6000 0862 STX L1 MOD21 ALLOW LOOP  
086A 0 4C00 09FE BSC L CNTIT CHK COUNT OPTION  
086C 0 4C00 0A7E RETRN LD L LPCNT LOOP CARD COUNTER  
086E 0 8400 0A83 A L K001 ADD 1  
0870 0 0400 0A7E STO L LPCNT  
0872 0 9400 0A87 TOTAL S L K100 SUBTRACT 100  
0874 0 4C10 0877 BSC L CHECK,- 100 CARDS FED  
0876 0 70D5 MDX BUZY CHECK FOR BUSY  
  
0877 0 4C00 0A7D CHECK LD L CLCNT LOAD COLUMN COUNT  
*****  
* WAIT 2 *  
*  
* NORMAL WAIT AFTER DESIRED NUMBER OF CARDS *  
* HAVE BEEN READ. PRESS START TO READ THE *  
* NUMBER OF BLANK CARDS DESIRED *  
*****  
0879 0 3002 WAIT 2 100 CARDS FED  
  
087A 0 6200 LDX 2 0  
087B 0 6E00 0A7E STX L2 LPCNT RESET LOOP COUNT  
087D 0 6E00 0A7D STX L2 CLCNT RESET COLUMN COUNT  
087F 0 70CC MDX BUZY RESTART LOOP CHECK  
  
0880 0 0400 0A80 CKRDY STO L DSW1 STORE DSW  
0882 0 0C00 0A5A XIO L SENSE SENSE FOR READY  
0884 0 9400 0A80 S L DSW1 SUBTRACT LAST DSW  
0886 0 4C18 088A BSC L CKRDY&10,&-  
0888 0 4C00 085A BSC L START&2 DSW CHANGED  
088A 0 0C00 0A5A XIO L SENSE RESET DSW  
088C 0 6100 LDX 1 0  
088D 0 6D00 0A80 STX L1 DSW1 RESET STORED DSW  
088F 0 4C04 0893 BSC L NORDY,E NOT READY  
0891 0 4C00 085E BSC L START&6 READY  
  
*  
* *****  
* WAIT 3 *  
* READER NOT READY *  
* *****  
0893 0 3003 NORDY WAIT 3 READER NOT READY  
0894 0 0C00 0A5A XIO L SENSE SENSE & RESET
```

3A808180
3A808190
3A808200
3A808210
3A808220
3A808230
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3A808250
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3A808290
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3A808830
3A808840
3A808850

0896 0 4C00 085A

0898 0 0000
0899 0 0C00 0A5A
089B 0 7401 0A7D
089D 0 6500 08B3
089F 0 6D00 000C
08A1 0 6680 0A9C
08A3 0 6ABE
08A4 0 4C40 08A6

08A6 0 0C00 0A76
08A8 0 4C00 0860

08AA 0 3022

08AB 0 6500 0001
08AD 0 6D00 08AA
08AF 0 6100
08B0 0 6D00 0A7D
08B2 0 70B0

08B3 0 0000
08B4 0 0C00 0A5A
08B6 0 7401 0A7C
08B8 0 6500 3021
08BA 0 6D00 0862
08BC 0 6500 3022
08BE 0 6D00 08AA
08C0 0 4C00 0A7D
08C2 0 9400 0A86
08C4 0 4C58 08DB
08C6 0 4C68 0922
08C8 0 4C40 08CA
08CA 0 4C00 0A7D

08CC 0 3023
08CD 0 6100
08CE 0 6D00 0A7D
08D0 0 6680 0A9D
08D2 0 6E00 08CC
08D4 0 4C40 0863

08D6 0 6100
08D7 0 6D00 0A7D
08D9 0 4C00 0860

08DB 0 6500 3021
08DD 0 6D00 0862

```
BSC L START&2 READER READY  
*  
INT00 DC 0  
XIO L SENSE  
MDX L CLCNT,&1 ADD 1 TO COLUMN CNT  
LDX L1 INT04 RESTORE LEVEL 4 VEC.  
STX L1 /000C  
LDX I2 MDFY3 MDX WAIT 22  
STX 2 MOD21 CHECK FOR LEVEL 4  
BOSC L COLGO RESET LEVEL 0  
*  
COLGO XIO L READ  
BSC L LESS1  
*****  
* WAIT 22 *  
*  
* AT LEAST 1 COLUMN INTERRUPT WAS GENERATED *  
* AND NO END OP GENERATED FOR LAST CARD. *  
* THE NUMBER OF COLUMNS READ IS DISPLAYED *  
* IN THE A REG. *  
* PUSH START FOR SCOPE LOOP. *  
*****  
MOD22 WAIT /22 NO LEVEL 4 RECIEVED  
*****  
* SCOPE LOOP *  
*****  
*  
LDX L1 /0001 NOP  
STX L1 MOD22 ALLOW LOOP  
LDX 1 0 RESET COLUMN COUNT  
STX L1 CLCNT  
MDX MOD21&1 BRANCH TO LOOP  
*  
INT04 DC 0  
XIO L SENSE  
MDX L GDCNT,&1 ADD 1 TO GOOD PASS  
LDX L1 /3021  
STX L1 MOD21 RESTORE WAIT 21  
LDX L1 /3022  
STX L1 MOD22 RESTORE WAIT 22  
LD L CLCNT LOAD COLUMN COUNT  
S L K080 CHECK FOR 80 COLUMNS  
BOSC L CNTOK,&- CHECKED OK  
BOSC L MOD24,&2 BRANCH LESS THAN 80  
BOSC L CLERR  
CLERR LD L CLCNT LOAD COLUMN COUNT  
*****  
* WAIT 23 *  
*  
* MORE THAN 80 COLUMN INTERRUPTS RECEIVED *  
* WHEN END OP INTERRUPT WAS GENERATED. NUMBER *  
* OF COLUMN INTERRUPTS IS DISPLAYED IN A REG *  
* PUSH START FOR SCOPE LOOP. *  
*****  
MOD23 WAIT /23 MORE THAN 80 COLUMNS  
LDX 1 0 RESET COLUMN COUNT  
STX L1 CLCNT  
LDX I2 MDFY4  
STX L2 MOD23 ALLOW LOOP  
BOSC L CARDS BRANCH TO LOOP  
*  
HOPIT LDX 1 0  
STX L1 CLCNT RESET COLUMN COUNT  
BSC L LESS1  
*  
CNTOK LDX L1 /3021  
STX L1 MOD21 RESTORE WAIT 21
```

3A808860
3A808870
3A808880
3A808890
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3A809530

INTERRUPT TEST

```

08DF 0 6500 3022      LDX L1 /3022      3A809540
08E1 0 6D00 08AA      STX L1 MOD22      RESTORE WAIT 22  3A809550
08E3 0 6500 3023      LDX L1 /3023      3A809560
08E5 0 6D00 08CC      STX L1 MOD23      RESTORE WAIT 23  3A809570
08E7 0 6500 3024      LDX L1 /3024      3A809580
08E9 0 6D00 0924      STX L1 MOD24&2    RESTORE WAIT 24  3A809590
08EB 0 6500 3025      LDX L1 /3025      3A809600
08ED 0 6D00 0939      STX L1 MOD25      RESTORE WAIT 25  3A809610
08EF 0 6500 3026      LDX L1 /3026      3A809620
08F1 0 6D00 094E      STX L1 MOD26      RESTORE WAIT 26  3A809630
08F3 0 6500 3027      LDX L1 /3027      3A809640
08F5 0 6D00 0963      STX L1 MOD27      RESTORE WAIT 27  3A809650
08F7 0 6500 3028      LDX L1 /3028      3A809660
08F9 0 6D00 0978      STX L1 MOD28      RESTORE WAIT 28  3A809670
08FB 0 6500 3029      LDX L1 /3029      3A809680
08FD 0 6D00 098D      STX L1 MOD29      RESTORE WAIT 29  3A809690
08FF 0 6400 0A7C      LD L GDCNT        LOAD CARD COUNT  3A809700
0901 0 9400 0A84      S L KO10         SUBTRACT 10      3A809710
0903 0 4C10 0913      BSC L WAITA,-    CHK NUMBER OF PASSES 3A809720
0905 0 6100          LDX 1 0          3A809730
0906 0 6D00 0A7D      STX L1 CLCNT     RESET COLUMN COUNT 3A809740
0908 0 6D00 0A7E      STX L1 LPCNT     RESET LOOP CARD CNT 3A809750
090A 0 0C00 0A68      XIO L BITSW      SENSE BIT SWITCHES 3A809760
090C 0 6400 0A79      LD L BITS1       LOAD BIT SWITCHES  3A809770
090E 0 180C          SRA 12           CHK FOR WAIT 1 OPT 3A809780
090F 0 4C04 0914      BSC L WAITA&1,E RESTORE/GO TO WAIT 1 3A809790
0911 0 4C00 082D      BSC L SETUP&3   NOT 10 PASSES    3A809800
*
* *****
*          WAIT 4
*
0913 0 3004      WAITA WAIT 4    * DEVICE TESTED, *
*          * RAN SUCCESSFUL. *
* *****
*
*          RERUN
*
* TO RERUN PROGRAM PRESS START.
*
* *****
0914 0 6100      LDX 1 0
0915 0 6D00 0A7D STX L1 CLCNT     RESET COLUMN COUNT 3A809930
0917 0 6D00 0A7C STX L1 GDCNT     RESET CARD COUNT   3A809940
0919 0 0C00 0A68 XIO L BITSW      SENSE BIT SWITCHES 3A809950
091B 0 6400 0A79 LD L BITS1       LOAD BIT SWITCHES  3A809960
091D 0 180C          SRA 12           CHK FOR WAIT 1 OPT 3A809970
091E 0 4C04 0503 MOD12 BSC L MAPIT,E RESTORE/GO TO WAIT 1 3A809980
0920 0 4C00 06AF      BSC L CLR1X      RERUN PROGRAM    3A809990
*
0922 0 6400 0A7D MOD24 LD L CLCNT     LOAD COLUMN COUNT  3A810000
* *****
*          WAIT 24
*
* LESS THAN 80 COLUMN INTERRUPTS RECEIVED *
* WHEN END OP INTERRUPT WAS GENERATED.NUMBER*
* OF COLUMN INTERRUPTS IS DISPLAYED IN A REG*
* PUSH START FOR SCOPE LOOP.
* *****
0924 0 3024      WAIT /24
*
0925 0 6100      LDX 1 0          3A810010
0926 0 6D00 0A7D STX L1 CLCNT     RESET COLUMN COUNT 3A810020
0928 0 6680 0A9E LDX I2 MDFY5     ALLOW LOOP         3A810030
092A 0 6E00 0922 STX L2 MOD24     BRANCH TO LOOP    3A810040
092C 0 4C00 0863 BSC L CARDS      BRANCH TO LOOP    3A810050
*
092E 0 0000      INT01 DC 0       INTERRUPT 1        3A810060
092F 0 0C00 0A5A XIO L SENSE      INTERRUPT 1        3A810070

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INTERRUPT TEST

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0931 0 6400 0A7D      LD L CLCNT       LOAD COLUMN COUNT  3A810220
0933 0 6600 092E      LDX L2 INT01     3A810230
0935 0 6E00 000C      STX L2 /000C     3A810240
0937 0 4C40 0939      BOSC L MOD25     3A810250
* *****
*          WAIT 25
*
* INTERRUPT GENERATED,CAUSED A LEVEL 1
* ADDRESS TO BE GENERATED.
* PUSH START FOR SCOPE LOOP.
* *****
0939 0 3025      MOD25 WAIT /25   LEV 0 PICKED BIT 15 3A810260
*
093A 0 6100      LDX 1 0          3A810270
093B 0 6D00 0A7D STX L1 CLCNT     RESET COLUMN COUNT  3A810280
093D 0 6680 0A9F LDX I2 MDFY6     ALLOW LOOP         3A810290
093F 0 6E00 0939 STX L2 MOD25     ALLOW LOOP         3A810300
0941 0 4C00 0863 BSC L CARDS      BRANCH TO LOOP    3A810310
*
0943 0 0000      INT02 DC 0       INTERRUPT 2        3A810320
0944 0 0C00 0A5A XIO L SENSE      INTERRUPT 2        3A810330
0946 0 6400 0A7D LD L CLCNT       LOAD COLUMN COUNT  3A810340
0948 0 6600 0943 LDX L2 INT02     ALLOW LOOP         3A810350
094A 0 6E00 000C STX L2 /000C     BRANCH TO LOOP    3A810360
094C 0 4C40 094E BOSC L MOD26     BRANCH TO LOOP    3A810370
* *****
*          WAIT 26
*
* INTERRUPT GENERATED,CAUSED A LEVEL 2
* ADDRESS TO BE GENERATED.
* PUSH START FOR SCOPE LOOP.
* *****
094E 0 3026      MOD26 WAIT /26   LEV 0 PICKED BIT 14 3A810380
*
094F 0 6100      LDX 1 0          3A810390
0950 0 6D00 0A7D STX L1 CLCNT     RESET COLUMN COUNT  3A810400
0952 0 6680 0AA0 LDX I2 MDFY7     ALLOW LOOP         3A810410
0954 0 6E00 094E STX L2 MOD26     ALLOW LOOP         3A810420
0956 0 4C00 0863 BSC L CARDS      BRANCH TO LOOP    3A810430
*
0958 0 0000      INT03 DC 0       INTERRUPT 3        3A810440
0959 0 0C00 0A5A XIO L SENSE      INTERRUPT 3        3A810450
095B 0 6400 0A7D LD L CLCNT       LOAD COLUMN COUNT  3A810460
095D 0 6600 0958 LDX L2 INT03     ALLOW LOOP         3A810470
095F 0 6E00 000C STX L2 /000C     BRANCH TO LOOP    3A810480
0961 0 4C40 0963 BOSC L MOD27     BRANCH TO LOOP    3A810490
* *****
*          WAIT 27
*
* INTERRUPT GENERATED,CAUSED A LEVEL 3
* ADDRESS TO BE GENERATED.
* PUSH START FOR SCOPE LOOP.
* *****
0963 0 3027      MOD27 WAIT /27   LEV 0 PICKED 14&15 3A810500
*
0964 0 6100      LDX 1 0          3A810510
0965 0 6D00 0A7D STX L1 CLCNT     RESET COLUMN COUNT  3A810520
0967 0 6680 0AA1 LDX I2 MDFY8     ALLOW LOOP         3A810530
0969 0 6E00 0963 STX L2 MOD27     ALLOW LOOP         3A810540
096B 0 4C00 0863 BSC L CARDS      BRANCH TO LOOP    3A810550
*
096D 0 0000      INT05 DC 0       INTERRUPT 5        3A810560
096E 0 0C00 0A5A XIO L SENSE      INTERRUPT 5        3A810570
0970 0 6400 0A7D LD L CLCNT       LOAD COLUMN COUNT  3A810580
0972 0 6600 096D LDX L2 INT05     BRANCH TO LOOP    3A810590

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```
0974 0 6E00 000C      STX L2 /000C
0976 0 4C40 0978      BOSC L MOD28
*****
*
*           WAIT 28
*
* INTERRUPT GENERATED,CAUSED A LEVEL 5
* ADDRESS TO BE GENERATED.
* PUSH START FOR SCOPE LOOP.
*****
0978 0 3028      MOD28 WAIT /28      LEV 0 PICKED 13&15
*
0979 0 6100      LDX 1 0      RESET COLUMN COUNT
097A 0 6D00 0A7D      STX L1 CLCNT
097C 0 6680 0AA2      LDX I2 MDFY9      ALLOW LOOP
097E 0 6E00 0978      STX L2 MOD28
0980 0 4C00 0863      BSC L CARDS      BRANCH TO LOOP
*
0982 0 0000      ADR12 DC 0
0983 0 0C00 0A5A      XIO L SENSE
0985 0 C400 0A7D      LD L CLCNT
0987 0 6600 0982      LDX L2 ADR12
0989 0 6E00 000C      STX L2 /000C
098B 0 4C40 098D      BOSC L MOD29
*****
*
*           WAIT 29
*
* BIT 12 WAS DROPPED WHEN INTERRUPT LEVEL
* 0 WAS GENERATED.
* PUSH START FOR SCOPE LOOP.
*****
098D 0 3029      MOD29 WAIT /29      INT 0 DROPPED BIT 12
*
098E 0 6100      LDX 1 0      RESET COLUMN COUNT
098F 0 6D00 0A7D      STX L1 CLCNT
0991 0 6680 0A9B      LDX I2 MDFY2      ALLOW LOOP
0993 0 6E00 098D      STX L2 MOD29
0995 0 4C00 0863      BSC L CARDS      BRANCH TO LOOP
*
0997 0 4C00 08D6      JUMP BSC L HOPIT
*
0999 0 0C00 0A68      CNTCK XIO L BITSW      READ BIT SWITCHES
099B 0 C400 0A79      LD L BITS1      LOAD BIT SWITCHES
099D 0 4C04 09B0      BSC L KNT01,E      SELECT COUNT OF 10
099F 0 1801      SRA 1      CHK COUNT OF 50
09A0 0 4C04 09B8      BSC L KNT02,E      SELECT COUNT OF 50
09A2 0 1801      SRA 1      CHK COUNT OF 250
09A3 0 4C04 09C0      BSC L KNT03,E      SELECT COUNT OF 250
09A5 0 1801      SRA 1      CHK COUNT OF 25000
09A6 0 4C04 09C8      BSC L KNT04,E      SEL COUNT OF 25000
09A8 0 6500 0A87      LDX L1 K100
09AA 0 6D00 06FF      STX L1 NUMBR&1      SET UP CNT OF 100
09AC 0 D500 0724      STO L1 NUMCK&1      SET UP LOOP COUNT
09AE 0 4C00 09D0      BSC L CKOVR
*
09B0 0 6500 0A84      KNT01 LDX L1 K010
09B2 0 6D00 06FF      STX L1 NUMBR&1      SET UP CNT OF 10
09B4 0 D500 0724      STO L1 NUMCK&1      SET UP LOOP COUNT
09B6 0 4C00 09D0      BSC L CKOVR
*
09B8 0 6500 0A85      KNT02 LDX L1 K050
09BA 0 6D00 06FF      STX L1 NUMBR&1      SET UP CNT OF 50
09BC 0 D500 0724      STO L1 NUMCK&1      SET UP LOOP COUNT
09BE 0 4C00 09D0      BSC L CKOVR
*
09C0 0 6500 0A88      KNT03 LDX L1 K250
```

```
3A810900
3A810910
3A810920
3A810930
3A810940
3A810950
3A810960
3A810970
3A810980
3A810990
3A811000
3A811010
3A811020
3A811030
3A811040
3A811050
3A811060
3A811070
3A811080
3A811090
3A811100
3A811110
3A811120
3A811130
3A811140
3A811150
3A811160
3A811170
3A811180
3A811190
3A811200
3A811210
3A811220
3A811230
3A811240
3A811250
3A811260
3A811270
3A811280
3A811290
3A811300
3A811310
3A811320
3A811330
3A811340
3A811350
3A811360
3A811370
3A811380
3A811390
3A811400
3A811410
3A811420
3A811430
3A811440
3A811450
3A811460
3A811470
3A811480
3A811490
3A811500
3A811510
3A811520
3A811530
3A811540
3A811550
3A811560
3A811570
```

```
09C2 0 6D00 06FF      STX L1 NUMBR&1      SET UP CNT OF 250
09C4 0 D500 0724      STO L1 NUMCK&1      SET UP LOOP COUNT
09C6 0 4C00 09D0      BSC L CKOVR
*
09C8 0 6500 0A89      KNT04 LDX L1 KMAX
09CA 0 6D00 06FF      STX L1 NUMBR&1      SET UP CNT OF 25000
09CC 0 D500 0724      STO L1 NUMCK&1      SET UP LOOP COUNT
09CE 0 4C00 09D0      BSC L CKOVR
*
09D0 0 0C00 0A68      CKOVR XIO L BITSW      READ BIT SWITCHES
09D2 0 C400 0A79      LD L BITS1      LOAD BIT SWITCHES
09D4 0 1804      SRA 4      DELAY CHANGE
09D5 0 4C04 09E6      BSC L NODLY,E      NO DELAY SELECTED
09D7 0 1801      SRA 1      CHECK FOR DELAY
09D8 0 4C04 09EC      BSC L DLY01,E      SELECTED DELAY
09DA 0 1801      SRA 1      CHECK FOR DELAY
09DB 0 4C04 09F2      BSC L DLY02,E      SELECTED DELAY
09DD 0 1801      SRA 1      CHECK FOR DELAY
09DE 0 4C04 09F8      BSC L DLY03,E      SELECTED DELAY
09E0 0 6500 0A7F      LDX L1 DELAY      SET DELAY FOR .5 SEC
09E2 0 6D00 06E9      STX L1 TEST1&1      SET UP DELAY
09E4 0 4C00 06DC      BSC L BUSY
*
09E6 0 6500 0A82      NODLY LDX L1 K000      LOAD ZERO
09E8 0 6D00 06E9      STX L1 TEST1&1      SET UP NO DELAY
09EA 0 4C00 06DC      BSC L BUSY
*
09EC 0 6500 0A8A      DLY01 LDX L1 TIME1
09EE 0 6D00 06E9      STX L1 TEST1&1      SET UP DELAY
09F0 0 4C00 06DC      BSC L BUSY
*
09F2 0 6500 0A8B      DLY02 LDX L1 TIME2
09F4 0 6D00 06E9      STX L1 TEST1&1      SET UP DELAY
09F6 0 4C00 06DC      BSC L BUSY
*
09F8 0 6500 0A8C      DLY03 LDX L1 TIME3
09FA 0 6D00 06E9      STX L1 TEST1&1      SET UP DELAY
09FC 0 4C00 06DC      BSC L BUSY
*
09FE 0 0C00 0A68      CNTIT XIO L BITSW      READ BIT SWITCHES
0A00 0 C400 0A79      LD L BITS1      LOAD BIT SWITCHES
0A02 0 4C04 0A13      BSC L CNT01,E      SEL CARD CNT OF 10
0A04 0 1801      SRA 1      CHK CARD CNT OF 50
0A05 0 4C04 0A19      BSC L CNT02,E      SEL CARD CNT OF 50
0A07 0 1801      SRA 1      CHK CARD CNT OF 250
0A08 0 4C04 0A1F      BSC L CNT03,E      SEL CARD CNT OF 250
0A0A 0 1801      SRA 1      CHK CARD CNT OF 25K
0A0B 0 4C04 0A25      BSC L CNT04,E      SEL CARD CNT OF 25K
0A0D 0 6500 0A84      LDX L1 K010
0A0F 0 6D00 0873      STX L1 TOTAL&1      SET UP CNT OF 10
0A11 0 4C00 0A2B      BSC L ENDCK
*
0A13 0 6500 0A84      CNT01 LDX L1 K010
0A15 0 6D00 0873      STX L1 TOTAL&1      SET UP CNT OF 10
0A17 0 4C00 0A2B      BSC L ENDCK
*
0A19 0 6500 0A85      CNT02 LDX L1 K050
0A1B 0 6D00 0873      STX L1 TOTAL&1      SET UP CNT OF 50
0A1D 0 4C00 0A2B      BSC L ENDCK
*
0A1F 0 6500 0A88      CNT03 LDX L1 K250
0A21 0 6D00 0873      STX L1 TOTAL&1      SET UP CNT OF 250
0A23 0 4C00 0A2B      BSC L ENDCK
*
0A25 0 6500 0A89      CNT04 LDX L1 KMAX
0A27 0 6D00 0873      STX L1 TOTAL&1      SET UP CNT OF 25000
0A29 0 4C00 0A2B      BSC L ENDCK
*
```

0A2B 0 0C00 0A68	ENDCK XID L	BITSW	READ BIT SWITCHES	3A812260
0A2D 0 C400 0A79	LD L	BITS1	LOAD BIT SWITCHES	3A812270
0A2F 0 1804	SRA	4	DELAY CHANGE	3A812280
0A30 0 4C04 0A41	BSC L	DLYNO,E	NO DELAY SELECTED	3A812290
0A32 0 1801	SRA	1	CHECK FOR DELAY	3A812300
0A33 0 4C04 0A47	BSC L	DLAY1,E	SELECTED DELAY	3A812310
0A35 0 1801	SRA	1	CHECK FOR DELAY	3A812320
0A36 0 4C04 0A4D	BSC L	DLAY2,E	SELECTED DELAY	3A812330
0A38 0 1801	SRA	1	CHECK FOR DELAY	3A812340
0A39 0 4C04 0A53	BSC L	DLAY3,E	SELECTED DELAY	3A812350
0A3B 0 6500 0A7F	LDX L1	DELAY	SET DELAY FOR .5 SEC	3A812360
0A3D 0 6D00 0859	STX L1	START&1	SET UP DELAY	3A812370
0A3F 0 4C00 086C	BSC L	RETRN		3A812380
*				
0A41 0 6500 0A82	DLYNO LDX L1	K000	LOAD ZERO	3A812390
0A43 0 6D00 0859	STX L1	START&1	SET UP NO DELAY	3A812400
0A45 0 4C00 086C	BSC L	RETRN		3A812410
*				
0A47 0 6500 0A8A	DLAY1 LDX L1	TIME1		3A812420
0A49 0 6D00 0859	STX L1	START&1	SET UP DELAY	3A812430
0A4B 0 4C00 086C	BSC L	RETRN		3A812440
*				
0A4D 0 6500 0A8B	DLAY2 LDX L1	TIME2		3A812450
0A4F 0 6D00 0859	STX L1	START&1	SET UP DELAY	3A812460
0A51 0 4C00 086C	BSC L	RETRN		3A812470
*				
0A53 0 6500 0A8C	DLAY3 LDX L1	TIME3		3A812480
0A55 0 6D00 0859	STX L1	START&1	SET UP DELAY	3A812490
0A57 0 4C00 086C	BSC L	RETRN		3A812500
*				
0A5A 0000	BSS E	0		3A812510
0A5A 0 0000	SENSE DC	0	RESET DSW	3A812520
0A5B 0 1703	DC	/1703		3A812530
0A5C 0 0000	SENPT DC	0		3A812540
0A5D 0 1F01	DC	/1F01		3A812550
0A5E 0 0000	SEN25 DC	0	SENSE 2501 DSW	3A812560
0A5F 0 4F03	DC	/4F03		3A812570
0A60 0 0000	DISK DC	0		3A812580
0A61 0 2701	DC	/2701		3A812590
0A62 0 0000	PLOT DC	0		3A812600
0A63 0 2F01	DC	/2F01		3A812610
0A64 0 0000	PRINT DC	0		3A812620
0A65 0 3701	DC	/3701		3A812630
0A66 0 0000	CONSL DC	0		3A812640
0A67 0 0F01	DC	/0F01		3A812650
0A68 0 0A79	BITSW DC	BITS1		3A812660
0A69 0 3A00	DC	/3A00		3A812670
0A6A 0 0000	STOP DC	0		3A812680
0A6B 0 3F01	DC	/3F01		3A812690
0A6C 0 0000	FEED DC	0		3A812700
0A6D 0 1402	DC	/1402		3A812710
0A6E 0 0A70	FEEDS DC	TABLE		3A812720
0A6F 0 4E00	DC	/4E00		3A812730
0A70 0 0001	TABLE DC	1		3A812740
0A71 0 0000	DC	0		3A812750
0A72 0 0000	RESTR DC	0		3A812760
0A73 0 1404	DC	/1404	READER START	3A812770
0A74 0 0000	CNTRL DC	0		3A812780
0A75 0 1C00	DC	/1C00	ADVANCE TAPE	3A812790
0A76 0 0A78	READ DC	RAREA		3A812800
0A77 0 1200	DC	/1200		3A812810
0A78 0001	RAREA BSS	1		3A812820
0A79 0 0000	BITS1 DC	0	BIT SWITCH SETTINGS	3A812830
0A7A 0 0000	BITS2 DC	0	LAST DEVICE SELECTED	3A812840
0A7B 0 0000	BITS3 DC	0	LEVEL ON BITS	3A812850
0A7C 0 0000	GDCNT DC	0	GOOD PASS COUNT	3A812860
0A7D 0 0000	CLCNT DC	0	COLUMN COUNT	3A812870
0A7E 0 0000	LPCNT DC	0	LOOP COUNT	3A812880

0A7F 0 F700	DELAY DC	/F700	SCOPE LOOP DELAY	3A812940
0A80 0 0000	DSW1 DC	0		3A812950
0A81 0 0001	ADD01 DC	1		3A812960
0A82 0 0000	K000 DC	0	CONSTANT ZERO	3A812970
0A83 0 0001	K001 DC	1	CONSTANT 1	3A812980
0A84 0 000A	K010 DC	10	CONSTANT 10	3A812990
0A85 0 0032	K050 DC	50	CONSTANT 50	3A813000
0A86 0 0050	K080 DC	80	CONSTANT 80	3A813010
0A87 0 0064	K100 DC	100	CONSTANT 100	3A813020
0A88 0 00FA	K250 DC	250	CONSTANT 250	3A813030
0A89 0 61A8	KMAX DC	/61A8	CONSTANT 25000	3A813040
0A8A 0 0DE0	TIME1 DC	/0DE0	DELAY - 62.5 MSEC	3A813050
0A8B 0 1EE0	TIME2 DC	/1EE0	DELAY - 125 MSEC	3A813060
0A8C 0 3DC0	TIME3 DC	/3DC0	DELAY - 250 MSEC	3A813070
0A8D 0 1000	NOP1T DC	/1000		3A813080
0A8E 0 1801	SRA01 DC	/1801		3A813090
0A8F 0 180A	SRA10 DC	/180A		3A813100
0A90 0 180B	SRA11 DC	/180B		3A813110
0A91 0 70E9	MOFYA MDX	X	BUSY-MOD11-1	3A813120
0A92 0 707B	MOFYB MDX	X	GAPIT-MOD13-1	3A813130
0A93 0 706B	MOFYC MDX	X	GAPIT-MOD14-1	3A813140
0A94 0 705B	MOFYD MDX	X	GAPIT-MOD15-1	3A813150
0A95 0 704B	MOFYE MDX	X	GAPIT-MOD16-1	3A813160
0A96 0 70F4	MOFYF MDX	X	GAPIT-MOD17-1	3A813170
0A97 0 70D4	MOFYG MDX	X	GAPIT-MOD18-1	3A813180
0A98 0 70C8	MOFYH MDX	X	GAPIT-MOD19-1	3A813190
0A99 0 70BC	MOFYJ MDX	X	GAPIT-MOD1A-1	3A813200
0A9A 0 701A	MOFYL MDX	X	CKRUN-MOD11-1	3A813210
0A9B 0 7009	MDFY2 MDX	X	JUMP-MOD29-1	3A813220
0A9C 0 7047	MDFY3 MDX	X	MOD22-MOD21-1	3A813230
0A9D 0 7009	MDFY4 MDX	X	HOPIT-MOD23-1	3A813240
0A9E 0 70B3	MDFY5 MDX	X	HOPIT-MOD24-1	3A813250
0A9F 0 709C	MDFY6 MDX	X	HOPIT-MOD25-1	3A813260
0AA0 0 7087	MDFY7 MDX	X	HOPIT-MOD26-1	3A813270
0AA1 0 7033	MDFY8 MDX	X	JUMP-MOD27-1	3A813280
0AA2 0 701E	MDFY9 MDX	X	JUMP-MOD28-1	3A813290
0AA4 0501	END	BEGIN		3A813300

NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

INTERRUPT TEST

C R O S S R E F E R E N C E

NAME	VALUE	REFERENCES
ADD01	0A81	06FA
ADR12	0982	0845,0987
BAD12	07DC	051B,05EB,0635,067D
BAD14	07E8	051F,05ED,0637,067F
BEGIN	0501	0AA4
BITSW	0A68	052C,053F,0614,065C,06A4,06E1,07AD,0851,090A,0919,0999,09D0,09FE 0A2B
BITS1	0A79	052E,0541,0616,065E,06A6,06E3,07AF,0853,090C,091B,099B,09D2,0A00 0A2D,0A68
BITS2	0A7A	0531,0619,0661,06A9
BITS3	0A7B	0544,0549
BUSY	06DC	05D7,05F7,0621,0641,0669,0689,06DF,0715,07DA,09E4,09EA,09F0,09F6 09FC,0A91
BUZY	084C	084F,0876,087F
CARDS	0863	08D4,092C,0941,0956,096B,0980,0995
CHECK	0877	0874
CKBIT	0579	054B
CKDDK	07C8	05E9,0633,067B,0711
CKLOP	053F	061B,0663,06AB
CKOVR	09D0	09AE,09B6,09BE,09C6,09CE
CKRDY	0880	085C,0886
CKRUN	070D	06F2,0A9A
CLCNT	0A7D	0877,087D,089B,08B0,08C0,08CA,08CE,08D7,0906,0915,0922,0926,0931 093B,0946,0950,095B,0965,0970,097A,0985,098F
CLERR	08CA	08C8
CLRIX	06AF	0553,07B4,0920
CNTCK	0999	0719
CNTIT	09FE	086A
CNTOK	08DB	0856,08C4
CNTRL	0A74	064B
CNT01	0A13	0A02
CNT02	0A19	0A05
CNT03	0A1F	0A08
CNT04	0A25	0A0B
COLGO	08A6	08A4
CONSL	0A66	0821
DELAY	0A7F	06E8,0858,09E0,0A3B
DISK	0A60	0752
DLAY1	0A47	0A33
DLAY2	0A4D	0A36
DLAY3	0A53	0A39
DLYNO	0A41	0A30
DLY01	09EC	09D8
DLY02	09F2	09DB
DLY03	09F8	09DE
DSWCK	0800	05F1,05F3,05FD,05FF,063B,063D,0647,0649,0683,0685,068F,0691,06ED 0807
DSW1	0A80	0800,0805,080F,0880,0884,088D
ENDCK	0A2B	0A11,0A17,0A1D,0A23,0A29
ERROR	071B	071C,07B6
FDCYC	0716	070C,0727,072F,07E6,07F2,07FE,081C
FEED	0A6C	0601,06EF
FEEDS	0A6E	0693
FINSH	07A9	060D,0611,0655,0659,069D,06A1
GAPIT	07B6	0A92,0A93,0A94,0A95,0A96,0A97,0A98,0A99
GDCNT	0A7C	06F6,0717,07A3,07A7,082B,0864,08B6,08FF,0917
GLOP	0555	0585,058F,0599,05A3,05AD,05B7
HOPIT	08D6	0997,0A9D,0A9E,0A9F,0AA0
INT00	0898	082D
INT01	092E	0831,0933
INT02	0943	0835,0948
INT03	0958	0839,095D
INT04	08B3	083D,089D
INT05	096D	0841,0972
JUMP	0997	0A9B,0AA1,0AA2
KMAX	0A89	09C8,0A25

INTERRUPT TEST

KNT01	09B0	099D
KNT02	09B8	09A0
KNT03	09C0	09A3
KNT04	09C8	09A6
K000	0A82	09E6,0A41
K001	0A83	071F,07A5,086E
K010	0A84	060B,07A9,0901,09B0,0A0D,0A13
K050	0A85	09B8,0A19
K080	0A86	08C2
K100	0A87	0605,064F,0697,06FE,0723,0872,09A8
K250	0A88	09C0,0A1F
LESS1	0860	0861,08A8,08D9
LOOPS	0575	0578,0583,0589,0593,059D,05A7,05B1
LOOPO	0731	0581
LOOP1	0741	0587,058B
LOOP2	0751	0591,0595
LOOP3	0761	059B,059F
LOOP4	081F	05A5,05A9
LOOP5	07B8	05AF,05B3
LPCNT	0A7E	06F8,06FC,071D,0721,072D,0775,081A,086C,0870,087B,0908
MAPIT	0503	073F,074F,075F,076F,07C6,0828,091E
MDFY2	0A9B	0991
MDFY3	0A9C	08A1
MDFY4	0A9D	08D0
MDFY5	0A9E	0928
MDFY6	0A9F	093D
MDFY7	0AA0	0952
MDFY8	0AA1	0967
MDFY9	0AA2	097C
MOD1A	07F9	06C6,07A1,07F7,07FC,0A99
MOD11	06F2	06F4,070A,0710,0779,07D4,0A91,0A9A
MOD12	091E	0569
MOD13	073A	0557,056B,06B8,06CA,0738,073D,07B5,0A92
MOD14	074A	055B,056D,06BA,06CE,0748,074D,0789,0A93
MOD15	075A	055F,056F,06BC,06D2,0758,075D,078D,0A94
MOD16	076A	0563,0571,06BE,06D6,0768,076D,0791,0A95
MOD17	07C1	0567,0573,06C0,06DA,0795,07BF,07C4,0A96
MOD18	07E1	06C2,0799,07DF,07E4,0A97
MOD19	07ED	06C4,079D,07EB,07F0,0A98
MOD20	0827	0825
MOD21	0862	0868,08A3,08B2,08BA,08DD,0A9C
MOD22	08AA	08AD,08BE,08E1,0A9C
MOD23	08CC	08D2,08E5,0A9D
MOD24	0922	08C6,08E9,092A,0A9E
MOD25	0939	08ED,0937,093F,0A9F
MOD26	094E	08F1,094C,0954,0AA0
MOD27	0963	08F5,0961,0969,0AA1
MOD28	0978	08F9,0976,097E,0AA2
MOD29	098D	08FD,098B,0993,0A9B
MOFYA	0A91	07D2
MOFYB	0A92	073B
MOFYC	0A93	074B
MOFYD	0A94	075B
MOFYE	0A95	076B
MOFYF	0A96	07C2
MOFYG	0A97	07E2
MOFYH	0A98	07EE
MOFYJ	0A99	07FA
MOFYL	0A9A	0777
NOADR	07F4	0523,05EF,0639,0681
NODLY	09E6	09D5
NOFIT	0A8D	05F9,068B
NORDY	0893	088F
NRDYA	05BF	05BB
NRDYB	05C9	05C5
NRDYC	05D2	05CE
NUMBR	06FE	0607,0651,0699,09AA,09B2,09BA,09C2,09CA
NUMCK	0723	0609,0653,069B,06B6,09AC,09B4,09BC,09C4,09CC

INTERRUPT TEST

PLOT 0A62 0762
 PRINT 0A64 0742
 RAREA 0A78 0A76
 READ 0A76 08A6
 RESET 0849
 RESTR 0A72 085E
 RETRN 086C 0A3F,0A45,0A48,0A51,0A57
 RUNCK 06F1 0709,070F,077D,07D0
 RUNOK 0702 070B,0781
 SENPT 0A5C 05C2,061F,0732,0823
 SENSE 0A5A 05B9,05D5,06DC,06EA,072A,0736,0746,0756,0766,0772,07BD,07C9,07DD
 07E9,07F5,0802,080B,081F,084C,085A,0882,088A,0894,0899,08B4,092F
 0944,0959,096E,0983
 SEN25 0A5E 05CC,0667
 SETPT 061F 05C7
 SETUP 082A 060F,07AB,0911
 SET25 0667 05D0
 SET42 05D5 05BD
 SRA01 0A8E 05F5,0687
 SRA10 0A8F 0643
 SRA11 0A90 063F
 START 0858 0888,0891,0896,0A3D,0A43,0A49,0A4F,0A55
 STOP 0A6A 07B9
 TABLE 0A70 0A6E
 TEST1 06E8 05D9,05FB,0603,0623,0645,064D,066B,068D,0695,0809,0813,0816,09E2
 09E8,09EE,09F4,09FA
 TIME1 0A8A 09EC,0A47
 TIME2 0A8B 09F2,0A4D
 TIME3 0A8C 09F8,0A53
 TOTAL 0872 0A0F,0A15,0A1B,0A21,0A27
 VECTO 0581 0547
 VECT1 0587 057F
 VECT2 0591 054E
 VECT3 059B 057A
 VECT4 05A5 0551
 VECT5 05AF 057D
 VEC00 0735 0503,05DD,0627,066F,0734
 VEC01 0745 0507,05DF,0629,0671,0744
 VEC02 0755 050B,05E1,062B,0673,0754
 VEC03 0765 050F,05E3,062D,0675,0764
 VEC04 0771 0513,05E5,062F,0677,0682,06E6,0703,07D6
 VEC05 078C 0517,05E7,0631,0679,07BB
 WAITA 0913 0657,069F,07B2,0903,090F
 WAITC 07CD 07CB
 WAITF 0502
 WAITG 0729 05DB,0625,066D,0725
 WAIT1 0528 052B,0576
 WAIT2 0818 0700
 WAIT3 0815 0811
 WAIT8 053C
 WHAT1 05B9 053A
 WHAT2 05C2 0537
 WHAT3 05CC 0534
 WHICH 0529 0527,053D,05C0,05CA,05D3,061D,0665,06AD

END OF ASSEMBLY

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

CE UTILITY PROGRAMS

1130 ON LINE DISK ADJUSTMENT PROGRAM

1. PURPOSE

```

*****
* DISK ADJUSTMENT PROGRAM *
*****
*
* THE 1130 DISK ACCESS PROGRAM WAS DESIGNED TO BE
* USED WITH THE ACCESS ADJUSTMENT PROCEDURE FOUND
* IN THE SDS MAINTENANCE MANUAL.
*
* THE PROGRAM WILL MOVE THE ACCESS ARM BETWEEN
* TRACKS 2 AND 200, AND COMPARE SECTOR ZERO
* ADDRESSES AT THOSE TRACKS.
*
* THE SEEK OPERATION CAN BE SELECTED IN EITHER 10
* OR 20 MILL MODE.
*
*****
* THE C.E. MUST HAVE A 1130 SYSTEM WITH CARD
* READER OR PAPER TAPE INPUT.
*
* THE PROGRAM MUST BE LOADED BY A
* RELOCATABLE LOADER, IF 1442 USE
* PID 03AA, IF 2501 USE 03AB, IF
* PAPER TAPE USE 03AC.

```

3. USE PROCEDURE

3.1.1 PROGRAM LOADING

```

*****
* TO LOAD FROM CARDS.
*
* A. PLACE THE RELOCATING LOADER, AND THE DISK
* ADJUST TEST IN THE READER IN THAT ORDER.
* B. MAKE READER READY.
* C. PRESS THE 1131 RESET KEY.
* D. PRESS THE 1131 PROGRAM LOAD KEY.
* E. IF THE PROGRAM FAILS TO LOAD OR STOPS AT A
* WAIT BELOW ADDRESS /0160 REFER TO THE
* RELOCATING LOADER DOCUMENTATION.
*
* TO LOAD FROM PAPER TAPE.
*
* A. PLACE THE RELOCATING LOADER IN THE READER.
* B. MAKE READER READY.
* C. PRESS THE 1131 RESET KEY.
* D. PRESS THE 1131 PROGRAM LOAD KEY.
* E. LOADER WILL LOAD AND HALT AT WAIT 030F6 (BREG)
* F. PLACE THE DISK ADJUST TEST IN THE READER.
* G. MAKE READER READY.
* H. PRESS THE START KEY.
* I. IF THE PROGRAM FAILS TO LOAD OR STOPS AT A
* WAIT BELOW ADDRESS /0160 REFER TO RELOCATING
* LOADER DOCUMENTATION.

```

3.1.1 SETUP

```

* A. AT WAIT 0, ENTER DISK DRIVE AREA CODE
* IN CONSOLE SWITCHES 0 THRU 4 AND CLEAR
* BITS 5 THRU 14.
*
*
* DRIVE BIT SW SETTING
* 0...../2000
* 1...../8800
* 2...../9000
* 3...../9800
* 4...../A000
*
* B. WAIT ON TRACK ERROR.....SW 15.
* THIS SWITCH MAY BE CHANGED AT ANY TIME.

```

CE UTILITY PROGRAMS

1130 ON LINE DISK ADJUSTMENT PROGRAM

3.2 OPERATION

```

* C. DEPRESS START.
*
*****
* THE PROGRAM WILL START OUT IN 20 MILL MODE.
*
* THE ACCESS ARM IS FIRST RETURNED HOME.
* THE ARM THEN SEEKS TO TRACK 2 WHERE SECTOR
* ZERO IS READ AND COMPARED WITH TRACK ADDRESS 2.
* A GOOD COMPARE CAUSES THE CONSOLE PRINTER
* TO PRINT ONCE AND THE ACCESS ARM TO GO TO
* TRACK 200 WHERE THE SAME OPERATION IS REPEATED
* FOR TRACK 200. IF COMPARE AT TRACK 200 IS
* SUCCESSFUL, THE PRINTER WILL PRINT ONCE AND
* THE ACCESS ARM RETURNS TO TRACK 2 WHERE THE
* ABOVE OPERATION WILL BE REPEATED.
*
* IF A COMPARE ERROR IS DETECTED, THE PROGRAM
* WILL COME TO A WAIT PROVIDED THAT SW 15 IS ON.
* (SEE ERROR WAITS..(3.3)). IF SW 15 IS OFF
* AND AN ERROR IS ENCOUNTERED, THE PROGRAM WILL
* NOT CONTINUE AND THE PRINTER WILL NOT PRINT.
*
* TO STOP PROGRAM, DEPRESS IMMEDIATE STOP.
*
* TO RESTART PROGRAM, DEPRESS STOP.
*
* TO START PROGRAM, DEPRESS START.
*
* TO CHANGE FROM 20 MILL MODE OPERATION TO 10
* MILL OPERATION, OR VICE VERSA PERFORM THE
* FOLLOWING-
*
* A. DEPRESS IMMEDIATE STOP.
* B. DEPRESS PROGRAM RESET.
* C. DEPRESS START.

```

3.3 WAITS

/3000

ERROR WAITS

/30F1

/30F2

```

*****
* ENTER DISK DRIVE AREA CODE. ( SEE 3.1.C )
*
*****
* THE ADDRESS OF TRACK 2 - SECTOR ZERO WAS READ
* AND FOUND INVALID.
*
* IF ACCESS ARM IS SITTING AT DETENT 2,
* DEPRESS START TO CONTINUE ADJUSTMENT, ELSE
* DO A SECTOR REWRITE AS FOLLOWS-
* A. LOAD I REG TO /018C.
* B. PLACE CONSOLE SW IN RUN.
* C. DEPRESS START.
*
*****
***** CAUTION *****
*****
* ONLY USE TRACK 2 REWRITE OPTION
* WHEN SITTING AT WAIT /30F1
*
* REWRITE OPTION WILL DESTROY
* ORIGINAL SECTOR DATA.
*
*****
*****
* THE ADDRESS OF TRACK 200 - SECTOR ZERO WAS READ

```

1130 ON LINE DISK ADJUSTMENT PROGRAM

```

* AND FOUND INVALID.
*
* IF ACCESS ARM IS SITTING AT DETENT 200,
* DEPRESS START TO CONTINUE ADJUSTMENT, ELSE
* DO A SECTOR REWRITE AS FOLLOWS-
*   A. LOAD I REG TO /018F.
*   B. PLACE CONSOLE SW IN RUN.
*   C. DEPRESS START.
*
* ***** CAUTION *****
*
* * ONLY USE TRACK 200 REWRITE OPTION *
* * WHEN SITTING AT WAIT /30F2
*
* * REWRITE OPTION WILL DESTROY
* * ORIGINAL SECTOR DATA.
*
* *****
3.4 TERMINATION *****
* TO TERMINATE PROGRAM DEPRESS IMMEDIATE STOP.
4.0 PRINTOUTS *****
* NONE
5.0 COMMENTS *****
* TO RERUN PROGRAM ON ANOTHER DRIVE, PRESS THE
* STOP KEY AND THE PROGRAM WILL STOP AT WAIT 0
* SEE SECTION 3.1.C
*****
ABS
ORG /0160
*****
DISK ADJUSTMENT PROGRAM
*****
0160 0 6500 01DE BGN LDX L1 INT2 SET DISK INTERRUPT VECTOR
0162 0 6000 000A STX L1 /000A
0164 0 6500 0170 LDX L1 INT5 SET PROGRAM STOP VECTOR
0166 0 6000 000D STX L1 /000D
0168 0 6500 01E2 LDX L1 PRTIN SET PRINTER VECTOR
016A 0 6000 000C STX L1 /000C
*
016C 0 C84F PROGM LDD RESRT * SET AREA CODE IN
016D 0 DC00 0000 STD L 0 ** BIT SWITCHES
016F 0 7002 MDX WAIT SKIP VECTOR
*
0170 0 0000 INT5 DC *-* ENTRY POINT
0171 0 084C XIO SPDSW SENSE PROGRAM STOP
*
0172 0 1010 WAIT SLA 16 CLEAR ACC
0173 0 D06A STD INT2 CLEAR VECTOR
0174 0 D06D STO PRTIN CLEAR VECTOR
0175 0 3000 DC /3000 **
0176 0 7400 01DE MDX L INT2,0 TEST VECTOR FOR ZERO
0178 0 70F9 MDX WAIT INTERRUPT OCCURRED
0179 0 7400 01E2 MDX L PRTIN,0 TEST VECTOR FOR ZERO
017B 0 70F6 MDX WAIT INTERRUPT OCCURRED
017C 0 4878 BOSC +-Z BRANCHOUT
017D 0 1000 NOP FILL WORD

```

1130 ON LINE DISK ADJUSTMENT PROGRAM

```

*
017E 0 6210 LDX 2 16
017F 0 0858 XIO RDSPS **
0180 0 C068 LD AREA FETCH SW INPUT
0181 0 E069 AND F800 CLEAR BITS OTHER THAN AREA
0182 0 D066 STO AREA SET AREA CODE
0183 0 C600 01C5 AGAN1 LD L2 SNDSW-1 *
0185 0 E064 AND H07FF *
0186 0 E862 OR AREA * * SET AREA CODE
0187 0 D600 01C5 STO L2 SNDSW-1 * * INTO IOCC
0189 0 72FE MDX 2 -2 *
018A 0 70F8 MDX AGAN1 **
018B 0 7005 MDX SKHME *
*
018C 0 0838 WTTWO XIO WRT02 * WRITE ADDRESS AT
018D 0 4060 BSI TEST * TRACK 2
018E 0 7002 MDX SKHME *
*
018F 0 083A WTHND XIO WRT20 * WRITE ADDRESS AT
0190 0 405D BSI TEST * TRACK 200
*
0191 0 083C SKHME XIO HOME * GO HOME
0192 0 4058 BSI TEST *
0193 0 083C XIO TRK2 ** GO TO TRACK
0194 0 4059 BSI TEST ** 2
0195 0 7063 MDX CHCK2 *
*
0196 0 C051 ONWDO LD TOGGL *
0197 0 4C20 019F BSC L ONWD1,2 ** BR IF 10 MIL MODE
0199 0 C02C LD SNDSW *
019A 0 D037 STO TWHND *
019B 0 D038 STO TWO *
019C 0 6201 LDX 2 1 *
019D 0 6301 LDX 3 1 * * SET PROPER
019E 0 7007 MDX CMND1 * * MODE
*
019F 0 6201 ONWD1 LDX 2 1 *
01A0 0 6A31 STX 2 TWHND *
01A1 0 6A32 STX 2 TWO *
01A2 0 6680 01C6 LDX I2 SNDSW
01A4 0 6780 01C6 LDX I3 SNDSW
*
01A6 0 082B CMND1 XIO TWHND *
01A7 0 4046 BSI TEST ** GO TO TRACK 200
01A8 0 72FF MDX 2 -1 **
01A9 0 70FC MDX CMND1 *
*
01AA 0 0821 XIO READ *
01AB 0 4042 BSI TEST **
01AC 0 C065 LD INPUT&1 *
01AD 0 F02F EOR OUT20&1 * * READ/COMPARE
01AE 0 4C18 01B4 BSC L PRT1,+ * * ADDR AT TRK 200
*
01B0 0 4005 BSI RDSWT TEST FOR SW 15
01B1 0 4804 BSC E *
01B2 0 30F2 DC /30F2 ** ERROR, DID NOT
01B3 0 70DD MDX SKHME * COMPARE
*
01B4 0 4054 PRT1 BSI TPRT SPACE PRINTER
01B5 0 703F MDX CMND2 CONTINUE
*
01B6 0 0000 RDSWT DC *-* ENTRY POINT
01B7 0 081E XIO RDSPPT READ SWS
01B8 0 C033 LD SWDAT SET DATA TO ACC.
01B9 0 4C80 01B6 BSC I RDSWT EXIT
*
01BC 0000 BSS E

```

```

30A02060
30A02070
30A02080
30A02090
30A02100
30A02110
30A02120
30A02130
30A02140
30A02150
30A02160
30A02170
30A02180
30A02190
30A02200
30A02210
30A02220
30A02230
30A02240
30A02250
30A02260
30A02270
30A02280
30A02290
30A02300
30A02310
30A02320
30A02330
30A02340
30A02350
30A02360
30A02370
30A02380
30A02390
30A02400
30A02410
30A02420
30A02430
30A02440
30A02450
30A02460
30A02470
30A02480
30A02490
30A02500
30A02510
30A02520
30A02530
30A02540
30A02550
30A02560
30A02570
30A02580
30A02590
30A02600
30A02610
30A02620
30A02630
30A02640
30A02650
30A02660
30A02670
30A02680
30A02690
30A02700
30A02710
30A02720
30A02730

```

CE UTILITY PROGRAMS

1130 ON LINE DISK ADJUSTMENT PROGRAM

```

018C 0 4C00 0205 RESRT BSC L RSTRT MODE CHANGE SET/UP 30A02740
018E 0 0000 SPDSW DC 30A02750
018F 0 3F01 DC /3F01 IOCC-SENSE RESET (5) 30A02760
01C0 0 01C2 PRTI1 DC DATA SPACE 30A02770
01C1 0 0900 DC /0900 PRINTER IOCC 30A02780
01C2 0 C400 DATA DC /C400 ZERO(TILT/ROTATE) 30A02790
01C3 0 0F00 DC /0F00 SENSE AND NO RESET 30A02800
01C4 0 0000 SW1 DC *-* ERROR STOP SW. 30A02810
01C5 0 0F01 DC /0F01 SENSE AND RESET 30A02820
01C6 0 00C6 SNDSW DC 198 CONSTANT 198 30A02830
01C7 0 0701 DC /0701 IOCC-SENSE/RESET DSW 30A02840
01C8 0 01DA WRT02 DC OUT02 30A02850
01C9 0 0500 DC /0500 IOCC-WRITE TRACK 2 30A02860
01CA 0 01DC WRT20 DC OUT20 30A02870
01CB 0 0500 DC /0500 IOCC-WRITE TRACK 200 30A02880
01CC 0 0211 READ DC INPUT 30A02890
01CD 0 0600 DC /0600 IOCC-READ ADDRESS 30A02900
01CE 0 00CA HOME DC 202 30A02910
01CF 0 0404 DC /0404 IOCC-SEEK HOME 30A02920
01D0 0 0002 TRK2 DC 2 30A02930
01D1 0 0400 DC /0400 IOCC-GO TO TRK 2 30A02940
01D2 0 0000 TWHND DC *-* 30A02950
01D3 0 0400 DC /0400 IOCC-GO TO TRK 200 30A02960
01D4 0 0000 TWO DC *-* 30A02970
01D5 0 0404 DC /0404 IOCC-BACK TO TRK 2 30A02980
01D6 0 01EC RDSPT DC SWDAT READ SWITCHES 30A02990
01D7 0 3A00 DC /3A00 IOCC 30A03000
01D8 0 01E9 RDSPS DC AREA 30A03010
01D9 0 3A00 DC /3A00 IOCC-READ BIT SWS 30A03020
01DA 0 0001 OUT02 DC 1 WRT TRK 2 TABLE 30A03030
01DB 0 0010 DC /0010 * 30A03040
01DC 0 0001 OUT20 DC 1 WRT TRK 200 TABLE 30A03050
01DD 0 0640 DC /0640 * 30A03060
* 30A03070
01DE 0 0000 INT2 DC *-* * 30A03080
01DF 0 08E6 XIO SNDSW ** DISK INTERRUPT 30A03090
01E0 0 4CC0 01DE BOSC I INT2 * ROUTINE 30A03100
* 30A03110
* 30A03120
01E2 0 0000 PRTIN DC *-* ENTRY POINT 30A03130
01E3 0 0009 STO SAVE1 SAVE ACC. 30A03140
01E4 0 08DF XIO SW1 SENSE AND RESET PRT. 30A03150
01E5 0 C007 LD SAVE1 RESTURE ACC. 30A03160
01E6 0 4CC0 01E2 BOSC I PRTIN CLEAR INT. 30A03170
* 30A03180
* 30A03190
01E8 0 0000 TOGGL DC *-* MODE TOGGLE 30A03200
01E9 0 0000 AREA DC *-* CURRENT AREA CODE 30A03210
01EA 0 07FF H07FF DC /07FF 30A03220
01EB 0 F800 F800 DC /F800 CLEAR WORD 30A03230
01EC 0 0000 SWDAT DC *-* DATA SWITCH INPUT AREA 30A03240
01ED 0 0000 SAVE1 DC *-* ACC SAVE AREA 30A03250
* 30A03260
* 30A03270
01EE 0 0000 TEST DC *-* * 30A03280
01EF 0 08D6 XIO SNDSW ** 30A03290
01F0 0 180D SRA 13 * * CHECK FOR FILE 30A03300
01F1 0 4804 BSC E * * READY 30A03310
01F2 0 70FC MDX TEST&1 ** 30A03320
01F3 0 4C80 01EE BSC I TEST * 30A03330
* 30A03340
01F5 0 08DE CMND2 XIO TWO * 30A03350
01F6 0 40F7 BSI TEST * GO TO TRACK 2 30A03360
01F7 0 73FF MDX 3 -1 * 30A03370
01F8 0 70FC MDX CMND2 * 30A03380
* 30A03390
01F9 0 08D2 CHCK2 XIO READ * 30A03400
01FA 0 40F3 BSI TEST ** 30A03410
01FB 0 C016 LD INPUT&1 * *
    
```

CE UTILITY PROGRAMS

1130 ON LINE DISK ADJUSTMENT PROGRAM

```

01FC 0 FODE EOR OUT02&1 * * READ/COMPARE 30A03420
01FD 0 4C18 0203 BSC L PRT2,+ - * * ADDR AT TRK 2 30A03430
* 30A03440
01FF 0 4086 BSI RDSWT TEST FOR SWITCH 15 30A03450
0200 0 4804 BSC E SKIP IF SW OFF 30A03460
0201 0 30F1 DC /30F1 ** ERROR, DID NOT 30A03470
0202 0 708E MDX SKHME * COMPARE 30A03480
* 30A03490
0203 0 4005 PRT2 BSI TPRT SPACE PRINTER 30A03500
0204 0 7091 MDX ONWDO CONTINUE 30A03510
* 30A03520
0205 0 C0E2 RSTRT LD TOGGL * 30A03530
0206 0 F0D3 EOR OUT02 ** CHANGE MODE 30A03540
0207 0 D0E0 STU TOGGL ** 30A03550
0208 0 7088 MDX SKHME * 30A03560
* 30A03570
0209 0 0000 TPRT DC *-* ENTRY POINT 30A03580
020A 0 0887 XIO DATA SENSE PRINTER 30A03590
020B 0 1005 SLA 5 MOVE LEFT 30A03600
020C 0 4828 BSC +Z SKIP IF READY 30A03610
020D 0 70FC MDX TPRT+1 LOOP IF NOT READY 30A03620
020E 0 0881 XIO PRTI1 SPACE PRINTER 30A03630
020F 0 4C80 0209 BSC I TPRT EXIT 30A03640
* 30A03650
0211 0 0002 INPUT DC 2 INPUT AREA 30A03660
0212 0002 BSS 2 * 30A03670
0214 0160 END BGN 30A03680
    
```

NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

CE UTILITY PROGRAMS

1130 ON LINE DISK ADJUSTMENT PROGRAM

```

AGAN1 0183 018A
AREA 01E9 0180 0182 0186 01D8
BGN 0160 0214
CHCK2 01F9 0195
CMND1 01A6 019E 01A9
CMND2 01F5 01B5 01F8
DATA 01C2 01C0 020A
F800 01EB 0181
HOME 01CE 0191
H07FF 01EA 0185
INPUT 0211 01AC 01CC 01FB
INT2 01DE 0160 0173 0176 01E0
INT5 0170 0164
ONWDO 0196 0204
ONWD1 019F 0197
OUT02 01DA 01C8 01FC 0206
OUT20 01DC 01AD 01CA
PROGM 016C
PRTIN 01E2 0168 0174 0179 01E6
PRTI1 01C0 020E
PRT1 01B4 01AE
PRT2 0203 01FD
RDSPTS 01D8 017F
RDSPT 01D6 01B7
RDSWT 01B6 01B0 01B9 01FF
READ 01CC 01AA 01F9
RESRT 01BC 016C
RSTRT 0205 01BC
SAVE1 01ED 01E3 01E5
SKHME 0191 0188 018E 01B3 0202 0208
SNDSW 01C6 0183 0187 0199 01A2 01A4 01DF 01EF
SPDSW 01BE 0171
SWDAT 01EC 01B8 01D6
SW1 01C4 01E4
TEST 01EE 018D 0190 0192 0194 01A7 01AB 01F2 01F3 01F6 01FA
TOGGL 01E8 0196 0205 0207
TPRT 0209 01B4 0203 020D 020F
TRK2 01D0 0193
TWHND 01D2 019A 01A0 01A6
TWO 01D4 019B 01A1 01F5
WAIT 0172 016F 0178 017B
WRT02 01C8 018C
WRT20 01CA 018F
WTHND 018F
WTTWO 018C
END OF ASSEMBLY
    
```

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

```

***** 3A000020
* 3A000030
*   T A B L E   O F   C O N T E N T S   3A000040
* 3A000050
* 3A000060
* 3A000070
* 3A000080
* 3A000090
* 3A000100
* 3A000110
* 3A000120
* 3A000130
* 3A000140
* 3A000150
* 3A000160
* 3A000170
* 3A000180
* 3A000190
* 3A000200
* 3A000210
* 3A000220
* 3A000230
* 3A000240
* 3A000250
* 3A000260
* 3A000270
* 3A000280
* 3A000290
* 3A000300
* 3A000310
* 3A000320
* 3A000330
* 3A000340
* 3A000350
* 3A000360
* 3A000370
* 3A000380
* 3A000390
* 3A000400
* 3A000410
* 3A000420
* 3A000430
* 3A000440
* 3A000450
* 3A000460
* 3A000470
* 3A000480
***** 3A000490

```

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4. PRINTOUTS	1A
5. COMMENTS	1A
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6.02	
6.03	
6.04	
6.05	
6.06	
6.07	
6.08	
6.09	
6.10	
6.11	
6.12	
6.13	

```

***** 3A000510
* 3A000520
* 3A000530
* 3A000540
* 3A000550
* 3A000560
* 3A000570
* 3A000580
* 3A000590
* 3A000600
* 3A000610
* 3A000620
* 3A000630
* 3A000640
* 3A000650
* 3A000660
* 3A000670
* 3A000680
* 3A000690
* 3A000700
* 3A000710
* 3A000720
* 3A000730
* 3A000740
* 3A000750
* 3A000760
* 3A000770
* 3A000780
* 3A000790
* 3A000800
* 3A000810
* 3A000820
* 3A000830
* 3A000840
* 3A000850
* 3A000860
* 3A000870
* 3A000880
* 3A000890
* 3A000900
* 3A000910
* 3A000920
* 3A000930
* 3A000940
* 3A000950
* 3A000960
* 3A000970
* 3A000980
* 3A000990
* 3A001000
* 3A001010
* 3A001020
* 3A001030
* 3A001040
* 3A001050
* 3A001060
* 3A001070
* 3A001080
* 3A001090
***** 3A001100

```

1. PURPOSE

2. REQUIREMENTS

3. USE PROCEDURE

3.1 SETUP AND OPERATION

3.2 LOADING

3.3 WAITS

3.4 TERMINATION

3.5 RESTART

4. PRINTOUTS

5. COMMENTS

1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

6.	CHAR	* 1132	* 1403	* KEY/BD	* CON/PTR	U/C	* CON/PTR	L/C*	3A001120
APPENDIX A	A	* C1	* 64	* A000	* 3E	*	* 3C	* 3A001130	
	B	* C2	* 25	* 8800	* 1A	*	* 18	* 3A001140	
	C	* C3	* 26	* 8400	* 1E	*	* 1C	* 3A001150	
	D	* C4	* 67	* 8200	* 32	*	* 30	* 3A001160	
	E	* C5	* 68	* 8100	* 36	*	* 34	* 3A001170	
	F	* C6	* 29	* 8080	* 12	*	* 10	* 3A001180	
	G	* C7	* 2A	* 8040	* 16	*	* 14	* 3A001190	
	H	* C8	* 6B	* 8020	* 26	*	* 24	* 3A001200	
	I	* C9	* 2C	* 8010	* 22	*	* 20	* 3A001210	
	J	* D1	* 58	* 5000	* 7E	*	* 7C	* 3A001220	
	K	* D2	* 19	* 4800	* 5A	*	* 58	* 3A001230	
	L	* D3	* 1A	* 4400	* 5E	*	* 5C	* 3A001240	
	M	* D4	* 5B	* 4200	* 72	*	* 70	* 3A001250	
	N	* D5	* 1C	* 4100	* 76	*	* 74	* 3A001260	
	O	* D6	* 5D	* 4080	* 52	*	* 50	* 3A001270	
	P	* D7	* 5E	* 4040	* 56	*	* 54	* 3A001280	
	Q	* D8	* 1F	* 4020	* 66	*	* 64	* 3A001290	
	R	* D9	* 20	* 4010	* 62	*	* 60	* 3A001300	
	S	* E2	* 0D	* 2800	* 9A	*	* 98	* 3A001310	
	T	* F3	* 0E	* 2400	* 9E	*	* 9C	* 3A001320	
	U	* F4	* 4F	* 2200	* B2	*	* B0	* 3A001330	
	V	* E5	* 10	* 2100	* B6	*	* B4	* 3A001340	
	W	* E6	* 51	* 2080	* 92	*	* 90	* 3A001350	
	X	* E7	* 52	* 2040	* 96	*	* 94	* 3A001360	
	Y	* E8	* 13	* 2020	* A6	*	* A4	* 3A001370	
	Z	* E9	* 54	* 2010	* A2	*	* A0	* 3A001380	
	0	* F0	* 49	* 2000	* C4	*	*****	3A001390	
	1	* F1	* 40	* 1000	* FC	*		3A001400	
	2	* F2	* 01	* 0800	* D8	*	*****	3A001410	
	3	* F3	* 02	* 0400	* DC	*	* * CONSOLE	* 3A001420	
	4	* F4	* 43	* 0200	* F0	*	* * PRINTER	* 3A001430	
	5	* F5	* 04	* 0100	* F4	*	* * CONTROLS	* 3A001440	
	6	* F6	* 45	* 0080	* D0	*	*****	3A001450	
	7	* F7	* 46	* 0040	* D4	*	* * CARRIER	* 3A001460	
	8	* F8	* 07	* 0020	* E4	*	* * RETURN	* 3A001470	
	9	* F9	* 08	* 0010	* E0	*	* * 81	* 3A001480	
	=	* 7E	* 4A	* 00A0	* C2	*	*****	3A001490	
	\$	* 5B	* 62	* 4420	* 40	*	* * TAB	* 3A001500	
	.	* 4B	* 6E	* 8420	* 00	*	* * 41	* 3A001510	
	'	* 7D	* 08	* 0120	* E6	*	*****	3A001520	
	,	* 6B	* 16	* 2420	* 80	*	* * SPACE	* 3A001530	
	{	* 4D	* 57	* 8120	* FE	*	* * 21	* 3A001540	
	-	* 60	* 61	* 4000	* 84	*	*****	3A001550	
)	* 5D	* 2F	* 4120	* F6	*	* *BACK/SPACE*	* 3A001560	
	+	* 4E	* 6D	* 80A0	* DA	*	* * 11	* 3A001570	
	/	* 61	* 4C	* 3000	* BC	*	*****	3A001580	
	*	* 5C	* 23	* 4220	* D6	*	* * SHIFT TO	* 3A001590	
	&	* 50	* 15	* 8000	* 44	*	* * RED	* 3A001600	
	SPACE	* 00	* 7F	* 0000	* 21	*	* * 09	* 3A001610	
	NUMBER	*-----*		* 0420	* C0	*	* * *	* 3A001620	
	AT	*-----*		* 0220	* 04	*	*****	3A001630	
	LS THN	*-----*		* 8220	* DE	*	* * SHIFT TO	* 3A001640	
	LOG/NOT	*-----*		* 4060	* F2	*	* * BLACK	* 3A001650	
	SEM/CLM	*-----*		* 40A0	* D2	*	* * 05	* 3A001660	
	QUOTE	*-----*		* 0060	* E2	*	*****	3A001670	
	LOG/OR	*-----*		* 8060	* C6	*	* * LINE FEED*	* 3A001680	
	UNSCORE	*-----*		* 2120	* BE	*	* * 03	* 3A001690	
	QST MK	*-----*		* 2060	* 86	*	*****	3A001700	
	COLON	*-----*		* 0820	* 82	*		3A001710	
	GRT THN	*-----*		* 20A0	* 46	*		3A001720	
	EXCLAIM	*-----*		* 4820	* 42	*		3A001730	
	PERCENT	*-----*		* 2220	* 06	*		3A001740	
	CENT	*-----*		* 8820	* 02	*		3A001750	
	EOF	*-----*		* 0008	*****			3A001760	
	ER CHR	*-----*		* 0004	*			3A001770	
	ER FLD	*-----*		* 0002	*			3A001780	
	0-8-2	*-----*		* 2820	*			3A001790	

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

```

***** 3A002440
* 3A002450
* 3A002460
6. 1 STORAGE CHECK * EACH CORE LOCATION IS CHECKED WITH A PATTERN
* SET IN THE BIT SWITCHES. IF BIT 14 IS ON THE BIT
* SWITCHES ARE USED AS AN ADDRESS TO BE CHECKED
* AND THE PATTERN IS /5555. 3A002470
* 3A002480
* 3A002490
* 3A002500
A. PRELOAD SWS * BIT SW 15- HALT AFTER ONE PASS. 3A002510
* 14- USE ONE ADDRESS 3A002520
* 3- 4 K MEMORY 3A002530
* 2- 8 K 3A002540
* 1- 16 K 3A002550
* 0- 32 K 3A002560
* 3A002570
B. LOADING * IPL MODE FROM CARDS OR PAPER TAPE. 3A002580
* 3A002590
C. WAIT 1 * SET PATTERN OR ADDRESS IN BIT SWITCHES. 3A002600
* 3A002610
2 * ONE PASS COMPLETED, PRESS START TO CONTINUE. 3A002620
* 3A002630
6 * PATTERN CHANGED. THE BIT THAT WAS DROPPED OR 3A002640
* PICKED IS ON IN THE ACCUMULATOR. FAILING ADDRESS 3A002650
* IS IN ADDRESS LOCATION 2. PRESS START TO 3A002660
* CONTINUE OR DO A RESTART. 3A002670
* 3A002680
D. RESTART * PRESS IMMEDIATE STOP AND RESET. PRELOADING 3A002690
* SWITCHES MAY BE SET AS DESIRED. PRESS START. 3A002700
* 3A002710
E. COMMENTS * THIS PROGRAM WILL WRITE AND READ ALL CORE 3A002720
* ADDRESSES OUT SIDE THE PROGRAM AREA. 3A002730
* EACH ADDRESS IS WRITTEN AND CHECKED 2 TIMES. 3A002740
* IF AN ADDRESS IS FOUND TO BE A PROBLEM, SET BIT 3A002750
* 14 ON AND RESTART. PLACE THE ADDRESS IN THE BIT 3A002760
* SWITCHES AT WAIT 1. 3A002770
* THE PROGRAM WILL CHECK ONLY THAT ADDRESS WITH 3A002780
* THE PATTERN /5555. 3A002790
* 3A002800
***** 3A002810
ABS 3A002820
ORG 0 3A002830
LDX STGST 3A002840
STGSW DC *-* BIT SWITCH STG 3A002850
STGLC DC *-* ADRS LOCATION 3A002860
STGPN DC *-* STORAGE PATTERN 3A002870
STGCR DC *-* SIZE OF CORE 3A002880
STGHL DC *-* BIT 15- HALT 3A002890
* BIT 14- USE 1 ADRS 3A002900
STGRD DC /0001 3A002910
DC /003A *A* DC /3A00 RD BIT SW 3A002920
STGXX DC /0015 CONSTANT 3A002930
STGST LDX STGBD *A* LD STGXX 3A002940
SLA 6 * PATTERN TO USE 3A002950
OR STGXX * UNLESS ALTERNATE 3A002960
SLA 6 * IS SELECTED 3A002970
OR STGXX 3A002980
STO STGPN 3A002990
XIO STGRD READ BIT SWS 3A003000
LD STGSW GET BIT SW SETTINGS 3A003010
STO STGHL SET HALT IF B 15 ON 3A003020
SRA 2 3A003030
SLA 2 3A003040
S STGRD ADJ CORE SIZE 3A003050
STO STGCR STORE CORE SIZE 3A003060
WAIT 1 SET SWS FOR PATTERN 3A003070
* OR ADDRESS 3A003080
XIO STGRD READ BIT SWS 3A003090
LD STGSW GET BIT SW SETTINGS 3A003100
RTE 16 * AND SAVE IN Q REG 3A003110

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```

0000
0000 0 6009
0001 0 0000
0002 0 0000
0003 0 0000
0004 0 0000
0005 0 0000
0006 0 0001
0007 0 003A
0008 0 0015
0009 0 603F
000A 0 1006
000B 0 E8FC
000C 0 1006
000D 0 E8FA
000E 0 D0F4
000F 0 08F6
0010 0 C0F0
0011 0 D0F3
0012 0 1802
0013 0 1002
0014 0 90F1
0015 0 D0EE
0016 0 3001
0017 0 08EE
0018 0 C0E8
0019 0 18D0

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001A 0 C0EA LD STGHL GET CNTL WORD 3A003120
001B 0 1801 SRA 1 3A003130
001C 0 4804 BSC E USE SWS AS ADRS 3A003140
001D 0 7003 MDX STG7 * YES 3A003150
001E 0 18D0 RTE 16 * NO 3A003160
001F 0 D0E3 STO STGPN 3A003170
0020 0 7002 MDX STGO 3A003180
0021 0 18D0 STG7 RTE 16 3A003190
0022 0 D0E1 STO STGCR SET ADRS IN CORE SIZE 3A003200
0023 0 C0E0 STG0 LD STGCR LD CORE SIZE 3A003210
0024 0 D0DD STG0 STO STGLC STORE IN XR 2 3A003220
0025 0 C0DD STG1 LD STGPN LD PATTERN TO USE 3A003230
0026 0 00D2 STG2 DC /00D2 *A* TO STO 2 0 3A003240
0027 0 00C2 DC /00C2 *A* TO LD 2 0 3A003250
0028 0 1000 NOP 3A003260
0029 0 F0DC EOR STGRD CHG BIT 15 3A003270
002A 0 00D2 STG3 DC /00D2 *A* TO STO 2 0 3A003280
002B 0 00C2 DC /00C2 *A* TO LD 2 0 3A003290
002C 0 F0D9 EOR STGRD CHG BIT 15 BACK 3A003300
002D 0 F0D5 EOR STGPN CK STARTING PATTERN 3A003310
002E 0 4820 BSC 2 IS PATTERN THE SAME 3A003320
002F 0 3006 WAIT 6 * NO 3A003330
0030 0 C0D4 LD STGHL * YES 3A003340
0031 0 1801 SRA 1 3A003350
0032 0 4804 BSC E USE ONLY 1 ADRS 3A003360
0033 0 7006 MDX STG10 * YES 3A003370
0034 0 C0CD LD STGLC * NO, GET ADRS 3A003380
0035 0 90D0 S STGRD REDUCE ADRS 3A003390
0036 0 D0CB STO STGLC STORE IN XR 2 3A003400
0037 0 9006 S STGPG SUB PROG SIZE 3A003410
0038 0 4830 BSC Z- REACHED LAST ADRS 3A003420
0039 0 70EB MDX STG1 * NO 3A003430
003A 0 C0CA STG10 LD STGHL * YES 3A003440
003B 0 4804 BSC E HALT PROGRAM 3A003450
003C 0 3002 WAIT 2 * YES 3A003460
003D 0 70E5 MDX STGO * NO 3A003470
003E 0 003E STGPG DC STGPG LAST ADRS OF PROG 3A003480
* 3A003490
* 3A003500
* 3A003510
* 3A003520
* 3A003530
* 3A003540
* 3A003550
* 3A003560
* 3A003570
* 3A003580
* 3A003590
* 3A003600
* 3A003610
* 3A003620
* 3A003630
* 3A003640
* 3A003650
* 3A003660
* 3A003670
* 3A003680
* 3A003690

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*****
DC 0 SPACE FILLER
DC /0040 THE LAST FIVE WORDS ARE
DC /9000 * USED FOR PROGRAM
DC /2000 * IDENTIFICATION. THREE
DC /2000 * FOR THE PID AND TWO FOR
DC /1000 * SEQUENCE.

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1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

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***** 3A003710
* 3A003720
6.02 CONSOLE * 1. THE PROGRAM PRINTS ALTERNATE CHARACTERS OR
PRINTER * EXECUTES ALTERNATE CONTROL FUNCTIONS WHICH
* HAVE BEEN SELECTED IN THE BIT SWITCHES. 3A003730
* 3A003740
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE 3A003750
* DELAY BETWEEN XIO WRITE EXECUTIONS. 3A003760
* 3A003770
* 3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM 3A003780
* AFTER THE COMPLETION OF THE EXECUTION OF
* AN ALTERNATE XIO SEQUENCE. 3A003790
* 3A003800
* 3A003810
A. PRELOAD SWS * 1. IF DELAY IS DESIRED, SET DELAY CONTROL
* VALUE IN BIT SWITCHES 1 THRU 13. 3A003820
* 3A003830
* *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY. 3A003840
* SWS 1 THRU 13 ALL OFF, NO DELAY. 3A003850
* 2. IF A WAIT AFTER EACH PROGRAM PASS IS 3A003860
* DESIRED, TURN ON BIT SWITCH 15. 3A003870
* 3A003880
B. LOADING * LOAD IPL FROM CARD OR PAPER TAPE. 3A003890
* 3A003900
C. WAITS 1 * SET DESIRED CHAR/CONTROL CODES IN BIT SWITCHES
* 0 THRU 15. SEE PAGE 2 FOR BIT SW CODES. 3A003910
* 3A003920
* 1ST CHAR/CONTROL IN SWS 0 THRU 7. 3A003930
* 3A003940
* 2ND CHAR/CONTROL IN SWS 8 THRU 15. 3A003950
* 3A003960
* 2 * NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN
* SELECTED. DEPRESS START TO MAKE ANOTHER PASS. 3A003970
* 3A003980
* 3A003990
* 3 * NO INTERRUPT GENERATED AFTER XIO WRITE
* COMMAND WAS GIVEN. SEE COMMENTS. 3A004000
* 3A004010
* 3A004020
D. RESTART * 1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD
* SWITCH SETTINGS, DEPRESS IMMEDIATE 3A004030
* STOP AND RESET PUSH BUTTONS. 3A004040
* 3A004050
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS. 3A004060
* 3A004070
* 3. DEPRESS START. 3A004080
* 3A004090
E. COMMENTS * 1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.
* 2. IF PROGRAM LOOPS, CHECK Q REG FOR NOT RDY
* OR BUSY DSW BITS BEING ON. 3A004100
* 3A004110
* 3. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON
* OR TO BYPASS THE INTERRUPT WAIT, LOAD /602D
* INTO LOCATION /002A AND DO A PROGRAM RESTART. 3A004120
* 3A004130
* 3A004140
* 4. TO SET UP LOOP TO EXECUTE XIO, LOAD /602D
* INTO LOCATION /002A AND LOAD /1000 INTO
* LOCATION /0031 AND DO A PROGRAM RESTART. 3A004150
* 3A004160
* 3A004170
* 3A004180
***** 3A004190
0000 ORG 0 3A004200
0000 0 6012 CPBGN LDX CPBLD *A* TO LDX CPRDS /6024 3A004210
0001 0 0001 CPONE DC 1 CONSTANT ONE 3A004220
0002 0 0006 CPBSW DC CPDSW BIT SW SAVE AREA 3A004230
0003 0 003A DC /003A *A* TO /3A00 RD BIT SW 3A004240
0004 0 0006 CPWRT DC CPDSW CHARACTER ADDRESS 3A004250
0005 0 9000 DC /9000 *A* TO /0900 XIO PRINT 3A004260
0006 0 0000 CPDSW DC *- BIT SW READIN AREA 3A004270
0007 0 F010 DC /F010 *A* TO /0F01 XIO SENSE 3A004280
0008 0 0000 CPSET DC *- SW OPTION/DELAY SAVE 3A004290
0009 0 601D CPCTL LDX CPRDS 2ND CHAR SW/RESET MOD 3A004300
000A 0 0000 DC *- 3A004310
000B 0 0000 CPDSV DC *- DSW SAVE AREA 3A004320
000C 0 002C DC CPIN4 INTERRUPT ADDRESS 3A004330
000D 0 1810 CPALT SRA 16 CLR 2ND CHAR SW 3A004340
000E 0 D0FA STO CPCTL * 3A004350
000F 0 7012 MDX CPSEN GO CHK IF PRINT BUSY 3A004360
0010 0 3002 WAIT 2 COMPLETED PROG PASS 3A004370
0011 0 700F MDX CPSEN-1 RESTART PROGRAM 3A004380

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0012 0 C0F2 CPBLD LD CPWRT&1 BUILD WRITE IOCC 3A004390
0013 0 1804 SRA 4 * 3A004400
0014 0 D0F0 STO CPWRT&1 * 3A004410
0015 0 C0F1 LD CPDSW&1 BUILD SENSE RESET 3A004420
0016 0 1804 SRA 4 * DSW IOCC 3A004430
0017 0 D0EF STO CPDSW&1 * 3A004440
0018 0 C0EA LD CPBSW&1 BUILD READ BIT SW 3A004450
0019 0 1008 SLA 8 * IOCC 3A004460
001A 0 D0E8 STO CPBSW&1 * 3A004470
001B 0 C0FD LD CPCTL SET UP RESET AND 3A004480
001C 0 D0E3 STO CPRGN * START BRANCH 3A004490
001D 0 08F4 CPRDS XIO CPBSW READ BIT SWS FOR 3A004500
001E 0 C0E7 LD CPDSW * PROG OPTS/DELAY 3A004510
001F 0 D0F8 STO CPSET * 3A004520
0020 0 3001 WAIT 1 SET CHARS IN SWS 3A004530
0021 0 08E0 XIO CPBSW READ BIT SWS 3A004540
0022 0 C8E7 LD CPDSV-1 LOAD LAST DSW IN Q 3A004550
0023 0 08E2 XIO CPDSW CHK DEVICE NOT BUSY 3A004560
0024 0 D0E6 STO CPDSV * OR NOT READY AND 3A004570
0025 0 1004 SLA 4 * SAVE DSW 3A004580
0026 0 4820 BSC Z * 3A004590
0027 0 70FA MDX CPSEN * 3A004600
0028 0 C8E1 LD CPDSV-1 LOAD LAST DSW IN Q 3A004610
0029 0 08DA XIO CPWRT WRITE CHARACTER 3A004620
002A 0 3003 WAIT 3 WAIT FOR INTERRUPT 3A004630
002B 0 7006 MDX CPRET BRANCH TO DELAY 3A004640
002C 0 0000 CPIN4 DC *- INTERRUPT LEVEL 4 3A004650
002D 0 09D8 XIO CPDSW SENSE RESET DSW 3A004660
002E 0 D0DC STO CPDSV SAVE DSW 3A004670
002F 0 C8DB LD CPDSV LOAD DSW INTO Q REG 3A004680
0030 0 4850 BOSC - RESET INT LEVEL 3A004690
0031 0 70FB MDX CPIN4&1 RESENSE DSW 3A004700
0032 0 C8D7 CPRET LDD CPDSV-1 LOAD LAST DSW IN Q 3A004710
0033 0 C0D4 LD CPSET SET UP DELAY AND 3A004720
0034 0 1804 SRA 4 * EXECUTE DELAY 3A004730
0035 0 1003 SLA 3 * 3A004740
0036 0 90CA CPLOP S CPONE * 3A004750
0037 0 4810 BSC - * 3A004760
0038 0 70FD MDX CPLOP * 3A004770
0039 0 C0CC LD CPDSW LD, SET UP 2ND CHAR 3A004780
003A 0 1008 SLA 8 * 3A004790
003B 0 D0CA STO CPDSW * 3A004800
003C 0 C0CC LD CPCTL CHK IF 2ND CHAR SW 3A004810
003D 0 4820 BSC Z * OFF 3A004820
003E 0 70CE MDX CPALT NO, BRANCH 3A004830
003F 0 68C9 STX CPCTL YES, SET 2ND CHAR SW 3A004840
0040 0 C0C7 LD CPSET CHK 1 PASS OPTION SW 3A004850
0041 0 4804 BSC E * 3A004860
0042 0 70CD MDX CPALT&3 SW ON, GO TO WAIT 2 3A004870
0043 0 70DD MDX CPSEN-1 SW OFF, LOOP PROGRAM 3A004880
***** 3A004890
0044 0 0000 DC 0 SPACE FILLER 3A004900
0045 0 0000 DC 0 * 3A004910
0046 0 0000 DC 0 * 3A004920
0047 0 0000 DC 0 * 3A004930
0048 0 0000 DC 0 * 3A004940
0049 0 0000 DC 0 * 3A004950
004A 0 0000 DC 0 * 3A004960
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A004970
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A004980
004D 0 2000 DC /2000 * IDENTIFICATION. THREE 3A004990
004E 0 2000 DC /2000 * FOR THE PID AND TWO FOR 3A005000
004F 0 0800 DC /0800 * SEQUENCE. 3A005010

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1130 SCOPE LOOP PROGRAMS

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6.03 KEYBOARD

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***** 3A005030
* 3A005040
* 1. THE PROGRAM SELECTS KEYBOARD AND DISPLAYS 3A005050
* THE CHARACTER READ OR THE DSW SENSED WHEN A 3A005060
* KEY IS DEPRESSED. 3A005070
* 2. THE PROGRAM ALSO CHECKS THE INTERRUPT REQUEST 3A005080
* KEY OPERATION. 3A005090
* 3. AN OPTION IS AVAILABLE TO HALT PROGRAM BEFORE 3A005100
* A KEY IS DEPRESSED, OR LOOP IN A SELECT 3A005110
* KEYBOARD AND SENSE DSW MODE. 3A005120
* 4. SEE PAGE 2 FOR KEYBOARD CHAR CODES. 3A005130
* 3A005140
* A. PRELOAD SWS * NONE, SWITCHES MAY BE CHANGED AT ANY TIME. 3A005150
* 3A005160
* B. LOADING * LOAD IPL FROM CARD OR PAPER TAPE. 3A005170
* 3A005180
* C. WAITS 1 * SET DESIRED PROGRAM OPTIONS IN BIT SWS 14 AND 15. 3A005190
* 14 ON -- DISPLAY LAST CHAR READ IN Q REG. 3A005200
* 14 OFF - DISPLAY LAST DSW IN Q REG. 3A005210
* 15 ON -- WAIT AFTER EACH PROGRAM PASS. 3A005220
* 15 OFF - LOOP IN SELECT KEYBOARD AND SENSE 3A005230
* DSW MODE. 3A005240
* DEPRESS START. 3A005250
* 3A005260
* 2 * NORMAL PROGRAM WAIT IF BIT SW 15 IS ON. SELECT 3A005270
* LIGHT SHOULD BE ON. 3A005280
* LAST CHAR READ AND LAST DSW ARE DISPLAYED IN 3A005290
* ACCUMULATOR OR Q REG, DEPENDING ON BIT SW 14. 3A005300
* DEPRESS DESIRED KEYBOARD KEY OR DEPRESS INT. REQ. 3A005310
* 3A005320
* D. RESTART * 1. TO RESTART PROGRAM, DEPRESS IMMEDIATE STOP 3A005330
* AND RESET PUSH BUTTONS. 3A005340
* 2. DEPRESS START. 3A005350
* 3A005360
* E. COMMENTS * 1. LAST DSW SENSED OR LAST CHARACTER READ IS 3A005370
* DISPLAYED IN THE Q REG. SEE WAIT 1. 3A005380
* 2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON, 3A005390
* EXECUTE BIT SW 15 OFF OPTION. 3A005400
* 3A005410
***** 3A005420
***** 3A005430
0000 ORG 0 3A005440
0000 0 6024 KYBGN LDX KYBLD *A* TO /6032 LDX KYRST 3A005440
0001 0 0001 KYDNE DC 1 CONSTANT 1 3A005450
0002 0 0004 KYBSW DC KYDSW BIT SW SAVE AREA 3A005460
0003 0 003A DC /003A *A* TO /3A00 RD BIT SWS 3A005470
0004 0 6032 KYDSW LDX KYRST RESET VECT/BIT SWS 3A005480
0005 0 F010 DC /F010 *A* TO /OF01 XIO SENSE DSW 3A005490
0006 0 0000 KYSEL DC 0 3A005500
0007 0 C000 DC /C000 *A* TO /OC00 XIO SEL KYBD 3A005510
0008 0 000A KYRD DC KYKEY KEYED RD/IN AREA 3A005520
0009 0 A000 DC /A000 *A* TO /OA00 XIO KEY RD 3A005530
000A 0 0000 KYKEY DC *-* KEYED RD/IN AREA 3A005540
000B 0 0000 KYDSV DC *-* LAST DSW SENSED 3A005550
000C 0 0011 DC KYIN4 INTERRUPT ADDR 3A005560
000D 0 C8FC KYDCH LDD KYKEY LOAD LAST CHAR READ 3A005570
000E 0 18D0 RTE 16 SWAP LAST CHAR/DSW 3A005580
000F 0 D8FA STD KYKEY * 3A005590
0010 0 7011 MDX KYDSP 3A005600
0011 0 0000 KYIN4 DC *-* INTERRUPT ENTRY 3A005610
0012 0 08EF XIO KYBSW READ BIT SWS 3A005620
0013 0 08F0 XIO KYDSW SENSE RESET DSW 3A005630
0014 0 D0F6 STO KYDSV SAVE DSW 3A005640
0015 0 1001 SLA 1 CK IF RESPONSE 3A005650
0016 0 4850 BOSC - * 3A005660
0017 0 7001 MDX KYREQ NO, CHK IF REQUEST 3A005670
0018 0 7003 MDX KYRDW YES, READ CHAR CODE 3A005680
0019 0 1001 KYREQ SLA 1 CHECK IF REQUEST 3A005690
001A 0 4850 BOSC - * 3A005700

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001B 0 701A MDX KYSET NO, RESENSE DSW 3A005710
001C 0 08EB KYRDW XIO KYRD YES, READ LAST CHAR 3A005720
001D 0 08E8 XIO KYSEL SELECT KEYBOARD 3A005730
001E 0 C0E5 LD KYDSW CK IF CHAR/DSW IN Q 3A005740
001F 0 100E SLA 14 * 3A005750
0020 0 4828 BSC &Z * 3A005760
0021 0 70EB MDX KYDCH DISPLAY CHAR IN Q 3A005770
0022 0 C8E7 KYDSP LDD KYKEY DISPLAY DSW IN Q 3A005780
0023 0 7012 MDX KYSET GO SELECT KEYBOARD 3A005790
0024 0 CODE KYBLD LD KYBSW&1 BUILD IOCCS AND 3A005800
0025 0 1008 SLA 8 * RESET/START VECT 3A005810
0026 0 D0DC STO KYBSW&1 * 3A005820
0027 0 C0DD LD KYDSW&1 * 3A005830
0028 0 1804 SRA 4 * 3A005840
0029 0 D0DB STO KYDSW&1 * 3A005850
002A 0 C0DC LD KYSEL&1 * 3A005860
002B 0 1804 SRA 4 * 3A005870
002C 0 D0DA STO KYSEL&1 * 3A005880
002D 0 C0DB LD KYRDE1 * 3A005890
002E 0 1804 SRA 4 * 3A005900
002F 0 D0D9 STO KYRDE1 * 3A005910
0030 0 C0D3 LD KYDSW * 3A005920
0031 0 D0CE STO KYBGN * 3A005930
0032 0 3001 KYRST WAIT 1 SET PROGRAM OPTIONS 3A005940
0033 0 08D2 XIO KYSEL SELECT KEYBOARD 3A005950
0034 0 1010 SLA 16 CL LAST CHAR KEYED 3A005960
0035 0 D0D4 STO KYKEY * 3A005970
0036 0 08CB KYSET XIO KYBSW RD BIT SWS FOR OPTS 3A005980
0037 0 C0CC LD KYDSW CHK IF SEL/RD LOOP 3A005990
0038 0 100F SLA 15 * 3A006000
0039 0 4810 BSC - * OPTION IS SELECTED 3A006010
003A 0 70D7 MDX KYIN4&1 YES, GO SENSE DSW 3A006020
003B 0 C8CE LDD KYKEY DISPLAY CHAR/DSW IN Q 3A006030
003C 0 3002 WAIT 2 DEPRESS DESIRED KEY 3A006040
003D 0 70D4 MDX KYIN4&1 GO SENSE DSW 3A006050
***** 3A006060
003E 0 0000 DC 0 SPACE FILLER 3A006070
003F 0 0000 DC 0 * 3A006080
0040 0 0000 DC 0 * 3A006090
0041 0 0000 DC 0 * 3A006100
0042 0 0000 DC 0 * 3A006110
0043 0 0000 DC 0 * 3A006120
0044 0 0000 DC 0 * 3A006130
0045 0 0000 DC 0 * 3A006140
0046 0 0000 DC 0 * 3A006150
0047 0 0000 DC 0 * 3A006160
0048 0 0000 DC 0 * 3A006170
0049 0 0000 DC 0 * 3A006180
004A 0 0000 DC 0 * 3A006190
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A006200
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A006210
004D 0 2000 DC /2000 * IDENTIFICATION. THREE 3A006220
004E 0 2000 DC /2000 * FOR THE PID AND TWO FOR 3A006230
004F 0 0040 DC /0040 * SFQUENCE. 3A006240

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1130 SCOPE LOOP PROGRAMS

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***** 3A006260
* 3A006270
6.04 PAPER TAPE
PUNCH
* 1. THE PROGRAM PUNCHES ALTERNATE CHARACTERS
* WHICH HAS BEEN SELECTED IN THE BIT SWS,
* OR A BINARY PATTERN. 3A006280
* 3A006290
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE
* DELAY BETWEEN XIO PUNCH EXECUTIONS. 3A006310
* 3A006320
* 3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM
* AFTER THE COMPLETION OF THE EXECUTION OF
* A PROGRAM PASS. 3A006330
* 3A006340
* 3A006350
* 4. SEE PAGE 2A FOR BIT SW CONTROL BINARY PATTERN. 3A006360
* 3A006370
* 5. THIS TAPE MAY BE USED IN THE PAPER TAPE
* READER SCOPE LOOP, 6.05. 3A006380
* 3A006390
A. PRELOAD SWS
* 1. IF DELAY IS DESIRED, SET DELAY CONTROL
* VALUE IN BIT SWITCHES 1 THRU 13. 3A006400
* 3A006410
* *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.
* SWS 1 THRU 13 ALL OFF, NO DELAY. 3A006420
* 3A006430
* 2. IF A BINARY PATTERN IS DESIRED, TURN ON
* BIT SWITCH 14. 3A006440
* 3A006450
* 3. IF A WAIT AFTER EACH PROGRAM PASS IS
* DESIRED, TURN ON BIT SWITCH 15. 3A006460
* 3A006470
* 3A006480
B. LOADING
* LOAD IPL FROM CARD OR PAPER TAPE. 3A006490
* 3A006500
C. WAITS
1 * SET DESIRED CHARACTERS TO BE PUNCHED IN BIT SWS
* 0 THRU 15. SEE PAGE FOR BIT SW CODES. 3A006510
* 3A006520
* 1ST CHARACTER IN SWS 0 THRU 7.
* 2ND CHARACTER IN SWS 8 THRU 15. 3A006530
* 3A006540
* MAKE PAPER TAPE PUNCH READY.
* DEPRESS START. 3A006550
* 3A006560
* 3A006570
2 * NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN
* SELECTED. DEPRESS START TO MAKE ANOTHER PASS. 3A006580
* 3A006590
* 3A006600
3 * NO INTERRUPT GENERATED AFTER XIO PUNCH
* COMMAND WAS GIVEN. SEE COMMENTS. 3A006610
* 3A006620
* 3A006630
D. RESTART
* 1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD
* SWITCH SETTINGS, DEPRESS IMMEDIATE
* STOP AND RESET PUSH BUTTONS. 3A006640
* 3A006650
* 3A006660
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.
* 3A006670
* 3A006680
* 3A006690
E. COMMENTS
* 1. LAST DSW SENSED IS DISPLAYED IN THE Q REG. 3A006700
* 2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON
* OR TO BYPASS THE INTERRUPT WAIT, LOAD /6034
* INTO LOCATION /0031 AND DO A PROGRAM RESTART. 3A006710
* 3A006720
* 3A006730
* 3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6034
* INTO LOCATION /0031 AND LOAD /603A INTO
* LOCATION /0039 AND DO A PROGRAM RESTART. 3A006740
* 3A006750
* 3A006760
* 3A006770
***** 3A006780
0000 ORG 0 3A006790
0000 0 600D TPBGN LDX TPBLD *A* TO LDX TPRDS /6024 3A006800
0001 0 0001 TPONE DC 1 CONSTANT ONE 3A006810
0002 0 0006 TPBSW DC TPDSW BIT SW SAVE AREA 3A006820
0003 0 003A DC /003A *A* TO /3A00 RD BIT SWS 3A006830
0004 0 0006 TPWRT DC TPDSW CHARACTER ADDRESS 3A006840
0005 0 0019 DC /0019 *A* TO /1900 XIO PUNCH 3A006850
0006 0 0000 TPDSW DC *- BIT SW READIN AREA 3A006860
0007 0 001F DC /001F *A* TO /1F01 SENSE DSW 3A006870
0008 0 0000 TPSET DC *- SW OPTION/DELAY SAVE 3A006880
0009 0 601C TPCTL LDX TPRDS 2ND CHAR SW/RESET MOD 3A006890
000A 0 0000 TP100 DC *- *A* TO /0100 PATT BUILD 3A006900
000B 0 0000 TPDSV DC *- DSW SAVE AREA 3A006910
000C 0 0033 DC TPIN4 INTERRUPT ADDRESS 3A006920
000D 0 C0F7 TPBLD LD TPWRT&1 BUILD WRITE IOCC 3A006930

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1130 SCOPE LOOP PROGRAMS

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000E 0 1008 SLA 8 * 3A006940
000F 0 D0F5 STO TPWRT&1 * 3A006950
0010 0 C0F6 LD TPDSW&1 BUILD SENSE RESET 3A006960
0011 0 1008 SLA 8 * 3A006970
0012 0 E8EE OR TPONE * 3A006980
0013 0 D0F3 STO TPDSW&1 * 3A006990
0014 0 C0EE LD TPBSW&1 BUILD READ BIT SW 3A007000
0015 0 1008 SLA 8 * IOCC 3A007010
0016 0 D0EC STO TPRS&1 * 3A007020
0017 0 C0E9 LD TPONE BUILD PATTERN WORD 3A007030
0018 0 1008 SLA 8 * 3A007040
0019 0 D0F0 STO TP100 * 3A007050
001A 0 C0FF LD TPCTL SET UP RESET AND 3A007060
001B 0 D0F4 STO TPBGN * START BRANCH 3A007070
001C 0 08E5 TPRDS XIO TPBSW READ BIT SWS FOR 3A007080
001D 0 C0E8 LD TPDSW * PROG OPTS/DELAY 3A007090
001E 0 D0E9 STO TPSET * 3A007100
001F 0 3001 WAIT 1 SET CHARS IN SWS 3A007110
0020 0 1010 SLA 16 CLR PUNCH WD LOC 3A007120
0021 0 D0E4 STO TPDSW * 3A007130
0022 0 C0E5 LD TPSET CHK PUNCH OPTION 3A007140
0023 0 100E SLA 14 * 3A007150
0024 0 4828 BSC &Z * 3A007160
0025 0 7002 MDX TPPAT BIT 14 ON, PCH PATT 3A007170
0026 0 08DB XIO TPBSW READ BIT SWS 3A007180
0027 0 7005 MDX TPSEN GO SENSE DSW 3A007190
0028 0 C0DD TPPAT LD TPDSW LOAD PATTERN WORD 3A007200
0029 0 80E0 A TP100 BUILD NEXT WORD 3A007210
002A 0 D0DB STO TPDSW * 3A007220
002B 0 1010 TPALT SLA 16 CLR 2ND CHAR SW 3A007230
002C 0 D0DC STO TPCTL * 3A007240
002D 0 08D8 TPSEN XIO TPDSW SENSE DSW 3A007250
002E 0 D0DC STO TPDSV SAVE DSW 3A007260
002F 0 C8DA LDD TPDSV-1 LOAD LAST DSW IN Q 3A007270
0030 0 08D3 XIO TPWRT PUNCH CHARACTER 3A007280
0031 0 3003 WAIT 3 WAIT FOR INTERRUPT 3A007290
0032 0 7007 MDX TPRET BRANCH TO DELAY 3A007300
0033 0 0000 TPIN4 DC *- INTERRUPT LEVEL 4 3A007310
0034 0 C8D5 LDD TPDSV-1 LOAD LAST DSW INTO Q 3A007320
0035 0 08D0 XIO TPDSW SENSE RESET DSW 3A007330
0036 0 D0D4 STO TPDSV SAVE DSW 3A007340
0037 0 1003 SLA 3 CK IF PUNCH RESPONSE 3A007350
0038 0 4850 - BOSC RESET INT LEVEL 3A007360
0039 0 70FA MDX TPIN4&1 RESENSE DSW 3A007370
003A 0 C0CD TPRET LD TPSET SET UP DELAY AND 3A007380
003B 0 1801 SRA 1 * EXECUTE DELAY 3A007390
003C 0 90C4 TPLDP S TPONE * 3A007400
003D 0 4810 BSC - * 3A007410
003E 0 70FD MDX TPLDP * 3A007420
003F 0 C0C9 LD TPCTL CHK IF 2ND CHAR SW 3A007430
0040 0 4818 BSC &- * CLEARED 3A007440
0041 0 7004 MDX TPNOT YES 3A007450
0042 0 C0C3 LD TPDSW NO, SFT UP 2ND CHAR 3A007460
0043 0 1008 SLA 8 * 3A007470
0044 0 D0C1 STO TPDSW * 3A007480
0045 0 70E5 MDX TPALT PUNCH 2ND CHAR 3A007490
0046 0 68C2 TPNOT STX TPCTL SET 2ND CHAR SW 3A007500
0047 0 C0C0 LD TPSET CHK 1 PASS OPTION SW 3A007510
0048 0 4804 BSC E * 3A007520
0049 0 3002 WAIT 2 COMPLETED PROG PASS 3A007530
004A 0 70D7 MDX TPRS&6 LOOP PROGRAM 3A007540
***** 3A007550
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARF 3A007560
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A007570
004D 0 2000 DC /2000 * IDENTIFICATION, THREE 3A007580
004E 0 2000 DC /2000 * FOR THE PID AND TWO FOR 3A007590
004F 0 0020 DC /0020 * SEQUENCE. 3A007600

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6.05 PAPER TAPE
READER

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*****
* 1. THE PROGRAM READS CHARACTERS WHICH HAVE BEEN PUNCHED IN THE TAPE AND COMPARES THEM WITH A BINARY PATTERN OR ALTERNATE BIT SWITCH CHARACTERS.
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE DELAY BETWEEN XIO READ EXECUTIONS.
* 3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6 ON COMPARE ERRORS.
A. PRELOAD SWS
* 1. IF DELAY IS DESIRED, SET DELAY CONTROL VALUE IN BIT SWITCHES 1 THRU 13.
* *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY. SWS 1 THRU 13 ALL OFF, NO DELAY.
* 2. IF A BINARY PATTERN IS DESIRED, TURN ON BIT SWITCH 14.
* 3. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS DESIRED, TURN ON BIT SWITCH 15.
B. LOADING
* LOAD IPL FROM CARD OR PAPER TAPE.
C. WAITS
1 * LOAD PAPER TAPE INTO READER. SEE PAGE 2A FOR LOADING A BINARY PATTERN TAPE.
* PLACE 1ST CHARACTER TO BE READ FROM THE TAPE, JUST BEHIND SENSING PINS.
* SET DESIRED CHARACTERS TO COMPARE IN BIT SWS 0 THRU 15. SEE PAGE 2A FOR BIT SW CODES.
* 1ST CHARACTER IN SWS 0 THRU 7.
* 2ND CHARACTER IN SWS 8 THRU 15.
* DEPRESS START.
5 * NO INTERRUPT GENERATED AFTER XIO TAPE ADVANCE COMMAND WAS GIVEN. SEE COMMENTS.
6 * COMPARE ERROR. ACCUMULATOR CONTAINS THE CHAR READ. THIS CHARACTER IS NOW LOCATED 1 CHARACTER PAST THE SENSING PINS.
* TO READ/COMPARE NEXT CHARACTER, DEPRESS START.
* TO LOOP ON COMPARE ERROR, SEE PRELOAD SWS.
D. RESTART
* 1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD SWITCH SETTINGS, DEPRESS IMMEDIATE STOP AND RESET PUSH BUTTONS.
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.
* 3. DEPRESS START.
E. COMMENTS
* 1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.
* 2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON OR TO BYPASS THE INTERRUPT WAIT, LOAD /6002 INTO LOCATION /0042 AND DO A PROGRAM RESTART.
* 3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6002 INTO LOCATION /0042 AND LOAD /601A INTO LOCATION /0006 AND DO A PROGRAM RESTART.
0000 ORG 0
0000 0 6021 TRBGN LDX TRBLD *A* TO /602F LDX TRRST
0001 0 602F TRIN4 LDX TRRST INTERRUPT ENTRY
0002 0 0809 XIO TRDSW SENSE DSW
0003 0 0021 STD TRDSV SAVE DSW
0004 0 1001 SLA 1 CK FOR DP COMPLETE
0005 0 4850 BQSC - *
0006 0 70FB MDX TRIN4&1 NO, RESFNSE DSW
0007 0 0806 XIO TRRD YES, READ TAPE
0008 0 C01B LD TRARA COMPARE TO EXPECTED
0009 0 7008 MDX TRI4A GO TO TRI4A
000A 0 0000 TRADV DC /0000 BUILD CONSTANT
000B 0 E000 DC /F000 *A* TO /1000 XIO ADVANCE
000C 0 0001 TRDSW DC /0001 INT ADR/CONSTANT 1
000D 0 F808 DC /F808 *A* TO /1F01 XIO SENSE

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000E 0 0024 TRRD DC TRARA READ/IN ADDR
000F 0 001A DC /001A *A* TO /1A00 XIO READ
0010 0 0023 TRBSW DC TRBSW BIT SW SAVE ADDR
0011 0 003A DC /003A *A* TO /3A00 RD BIT SWS
0012 0 F010 TRI4A FOR TRBSW *
0013 0 4818 BSC E- *
0014 0 7005 MDX TRLOP-3 OK, GO TO DELAY
0015 0 C00B LD TRBLD ERR, CK LOOP/ERR OPT
0016 0 4804 BSC E *
0017 0 7002 MDX TRLOP-3 LOOP/ERR SELECTED
0018 0 C80B LDD TRARA LD WD READ AND DSW
0019 0 3006 WAIT 6 COMPARE ERROR WAIT
001A 0 C809 LDD TRARA LOAD DSW INTO Q
001B 0 C005 LD TRBLD SET UP DELAY
001C 0 1801 SRA 1 *
001D 0 90EE TRLOP S TRDSW *
001E 0 4810 BSC - *
001F 0 70FD MDX TRLOP *
0020 0 7014 MDX TRSTR CK ON PATT OPT
0021 0 C0FF TRBLD LD TRBSW&1 BUILD PROGRAM
0022 0 1008 TR100 SLA 8 *A* TO /0100 PATT. BUILD
0023 0 00FD TRSRW STC TRBSW&1 *A* TO *-* COMP S/P WORD
0024 0 C0F8 TRARA LD TRDSW&1 *A* TO *-* WORD READ
0025 0 1803 TRDSV SRA 3 *A* TO *-* SAVED DSW
0026 0 00E6 TRCTL STC TRDSW&1 *A* TO *-* ALT CHAR SW
0027 0 1008 SLA 8 *
0028 0 00F9 STD TR100 *
0029 0 C8E0 LDD TRADV *
002A 0 19C3 RTE 3 *
002B 0 00E3 STD TRPDE1 *
002C 0 080D STD TRADV *
002D 0 C093 LD TRIN4 *
002E 0 00D1 STD TRPGN *
002F 0 08E0 TRRST XIO TRBSW RD SWS DELAY/OPTIONS
0030 0 C0E2 LD TRBSW SAVE DELAY/OPTIONS
0031 0 00FF STD TRBLD *
0032 0 3001 WAIT 1 SET CHARACTERS IN SWS
0033 0 1010 SLA 16 INITIALIZE S/R WD
0034 0 00EE STD TRSRW *
0035 0 C0EB TRSTR LD TRBLD CK WHICH PATT OPTION
0036 0 100E SLA 14 *
0037 0 4828 BSC E2 *
0038 0 700F MDX TRPAT BINARY PATT SELECTED
0039 0 0806 XIO TRBSW READ BIT SWS-CHARS
003A 0 C0EB LD TRCTL CK WHICH CHAR
003B 0 4820 BSC Z *
003C 0 7006 MDX TRNOT SEL LEFT CHAR
003D 0 68E8 STD TRCTL SET ALT CHAR SW
003E 0 C0E4 LD TRSBW LOAD BIT SWS
003F 0 1008 TRALT SLA 8 SET UP RIGHT CHAR
0040 0 00E2 STD TRSRW SAVE IN S/R
0041 0 08C9 XIO TRADV ADVANCE TAPE
0042 0 3005 WAIT 5 WAIT FOR INTERRUPT
0043 0 1010 TRNOT SLA 16 CL ALT CHAR SW
0044 0 00E1 STD TRCTL *
0045 0 C00D LD TRSRW SET UP RIGHT CHAR
0046 0 1808 SRA 8 *
0047 0 70F7 MDX TRALT *
0048 0 C00A TRPAT LD TRSRW SET UP BINARY PATT
0049 0 8008 A TR100 *
004A 0 70F5 MDX TRALT&1 *
*****
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE
004C 0 9000 DC /9000 * USED FOR PROGRAM
004D 0 2000 DC /2000 * IDENTIFICATION. THREE
004E 0 2000 DC /2000 * FOR THE PID AND TWO FOR
004F 0 0010 DC /0010 * SEQUENCE.

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*****
* THIS PROGRAM WILL PUNCH THE DATA IN BIT SWITCHES
* 0-11 IN ALL COLUMN UNLESS BIT 12 IS ON AND THEN
* ONLY THE FIRST COLUMN IS PUNCHED. THESE CARDS
* MAY BE USED IN THE READER SCOPE LOOP 6.07 AND
* 6.11.
*
A. PRELOAD SWS * NONE, SWITCHES MAY BE SET AT ANY TIME.
*
B. LOADING * IPL MODE FROM CARDS OR PAPER TAPE.
*
C. WAIT 1 * SET DESIRED BIT SWITCHES AS FOLLOWS,
* BIT 15- HALT
* BIT 14- STACKER SELECT
* BIT 13- FEED A CARD
* BIT 12- TERMINATE PUNCHING
* 0 TO 11- PUNCHING PATTERN
2 * ONE PASS COMPLETED, PRESS START TO CONTINUE.
3 * LOST PUNCH INTERRUPT.
4 * LOST FEED OR INTIATE PUNCH INTERRUPT.
*
D. RESTART * PRESS IMMEDIATE STOP AND RESET. PRELOADING
* SWITCHES MAY BE SET AS DESIRED. PRESS START.
*
E. COMMENTS * 1. TO RUN THE PROG WITH INTERRUPT DELAY SWITCH
* ON OR BYPASS THE INTERRUPT WAIT LOAD /6012
* INTO LOCATION /0021 AND /0032 AND RESTART.
*
* 2. TO GET A FASTER LOOP THAN THE ABOVE PLACE
* /70FF IN THE NEXT LOCATION AFTER THE XIO. THE
* XIO WILL BE EXECUTED AFTER EACH BRANCH.
*****
0000 ORG 0
0000 0 6037 PHFED LDX PHBLD *A* TO /600F LDX PH1 3A009350
0001 0 0003 DC /0003 *A* DC /1402 FD A CD 3A009360
0002 0 0000 PHCTR DC *-* COLUMN COUNTER 3A009370
0003 0 0000 PHSWS DC *-* BIT SWITCH STG 3A009380
0004 0 0003 PHBSW DC /0003 READ IN ADRS 3A009390
0005 0 003A DC /003A *A* DC /3A00 3A009400
0006 0 0003 PHPCH DC PHSWS PCH I/O AREA 3A009410
0007 0 0011 DC /0011 *A* DC /1100 3A009420
0008 0 0011 PHPST DC PHINT COL INTR ADRS 3A009430
0009 0 A008 DC /A008 *A* DC /1401 3A009440
000A 0 0008 PHDSW DC /0008 PCH TERMINATOR 3A009450
000B 0 B818 DC /B818 *A* DC /1703 3A009460
000C 0 0011 PHSTK DC PHINT OP COMP INTR ADRS 3A009470
000D 0 0029 DC /0029 *A* DC /1480 3A009480
000E 0 00F0 PHK50 DC /00F0 80 COLS TIMES 3 3A009490
000F 0 3001 PH1 WAIT 1 SET BIT SWS 3A009500
0010 0 701F MDX PH2 3A009510
0011 0 0000 PHINT DC *-* INTERREPT ENTRY 3A009520
0012 0 08F7 XIO PHDSW SENSE DSW 3A009530
0013 0 1001 SLA 1 3A009540
0014 0 4850 BOSC - COL INTR ON 3A009550
0015 0 700C MDX PH6 * NO, TRY OP COMP 3A009560
0016 0 08ED XIO PHBSW 3A009570
0017 0 C0EA LD PHCTR COLUMN COUNTER 3A009580
0018 0 80EB A PHBSW ADD THREE 3A009590
0019 0 D0E8 STO PHCTR 3A009600
001A 0 F0F3 EOR PHK50 CHECK FOR LAST COLUMN 3A009610
001B 0 4820 BSC Z IS IT LAST COLUMN 3A009620
001C 0 7003 MDX PH4 3A009630
001D 0 C0E5 LD PHSWS GET DATA TO BE PUNCHED 3A009640

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001E 0 ERF8 OR PHDSW * AND OR IN PCH TERM 3A009660
001F 0 D0E3 STO PHSWS * ANS STORE BACK 3A009670
0020 0 08E5 PH4 XIO PHPCH PUNCH A COLUMN 3A009680
0021 0 3003 WAIT 3 WAIT FOR INTERRUPT 3A009690
0022 0 1003 PH6 SLA 3 3A009700
0023 0 4850 BOSC - OP COMP ON 3A009710
0024 0 6012 LDX PHINT&1 * NO, SENSE AGAIN 3A009720
0025 0 1010 SLA 16 * LEVEL 4- OP COMP 3A009730
0026 0 D0DB STO PHCTR CLEAR COLUMN COUNTER 3A009740
0027 0 08DC XIO PHBSW READ BIT SWITCHES 3A009750
0028 0 C0DA LD PHSWS GET SW SETTING 3A009760
0029 0 4804 BSC E HALT PROGRAM 3A009770
002A 0 3002 WAIT 2 * YES 3A009780
002B 0 1801 SRA 1 * NO 3A009790
002C 0 4804 BSC F DO STACKER SELECT 3A009800
002D 0 7005 MDX PH8 * YES 3A009810
002E 0 1801 SRA 1 * NO 3A009820
002F 0 4804 BSC E WHAT OPERATION 3A009830
0030 0 08CF PH2 XIO PHFED FEED A CARD 3A009840
0031 0 08D6 XIO PHPST START THE PUNCH 3A009850
0032 0 3005 WAIT 5 * PCH FROM SWS 3A009860
0033 0 08D8 PH8 XIO PHSTK GIVE STACKER COMMAND 3A009870
0034 0 C0CE LD PHSWS RSTORE ACC 3A009880
0035 0 1802 SRA 2 3A009890
0036 0 70F8 MDX PH2-1 3A009900
*
0037 0 C012 PHRLD LD PHRES BUILD XIO COMMANDS 3A009910
0038 0 D0C7 STO 0 SET UP RESTART 3A009920
0039 0 C0CF LD PHPST+1 * INIT PCH 3A009930
003A 0 1803 SRA 3 * 3A009950
003B 0 D0CD STO PHPST+1 * 3A009960
003C 0 F0C4 EOR PHFED&1 * FEED A CARD 3A009970
003D 0 D0C3 STO PHFED&1 * 3A009980
003E 0 C0C6 LD PHBSW+1 * READ BIT SWITCHES 3A009990
003F 0 1008 SLA 8 * 3A010000
0040 0 D0C4 STO PHBSW+1 * 3A010010
0041 0 C0C9 LD PHDSW+1 * SENSE DSW 3A010020
0042 0 1803 SRA 3 * 3A010030
0043 0 D0C7 STO PHDSW+1 * 3A010040
0044 0 C0C2 LD PHPCH+1 * PCH A COLUMN 3A010050
0045 0 1008 SLA 8 * 3A010060
0046 0 D0C0 STO PHPCH+1 * 3A010070
0047 0 C0C5 LD PHSTK+1 * STACK SELECT 3A010080
0048 0 1007 SLA 7 * 3A010090
0049 0 D0C3 STO PHSTK&1 * 3A010100
004A 0 600F PHRES LDX PH1 3A010110
*****
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A010130
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A010140
004D 0 2000 DC /2000 * IDENTIFICATION, THREE 3A010150
004E 0 2000 DC /2000 * FOR THE PID AND TWO FOR 3A010160
004F 0 0008 DC /0008 * SEQUENCE. 3A010170

```

```
***** 3A010190
* 3A010200
6.07 1442 READER * 1. THE PROGRAM READS A COLUMN OF DATA FROM 3A010210
* THE CARD AND COMPARES IT WITH THE BIT SWS. 3A010220
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE 3A010230
* DELAY BETWEEN XIO READ EXECUTIONS. 3A010240
* 3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6 3A010250
* ON COMPARE ERRORS. 3A010260
* 3A010270
A. PRELOAD SWS * 1. IF DELAY IS DESIRED, SET DELAY CONTROL 3A010280
* VALUE IN BIT SWITCHES 1 THRU 13. 3A010290
* *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY. 3A010300
* SWS 1 THRU 13 ALL OFF, NO DELAY. 3A010310
* 2. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS 3A010320
* DESIRED, TURN ON BIT SWITCH 15. 3A010330
* 3A010340
B. LOADING * LOAD IPL FROM CARD OR PAPER TAPE. 3A010350
* 3A010360
C. WAITS 1 * SET BIT SWITCHES 0 THRU 11 TO EXPECTED COLUMN 3A010370
* DATA AND SET BITS 12 THRU 15 OFF. 3A010380
* LOAD PREPUNCHED CARDS INTO READER AND MAKE RDY. 3A010390
* DEPRESS START. 3A010400
* 3A010410
4 * NO INTERRUPT GENERATED AFTER XIO READ. 3A010420
* COMMAND WAS GIVEN. SEE COMMENTS. 3A010430
* 3A010440
6 * COMPARE ERROR. ACCUMULATOR CONTAINS BITS READ. 3A010450
* IF ACCUMULATOR CONTAINS /00FF, COLUMN READ WAS 3A010460
* NOT STORED INTO READ/IN AREA. 3A010470
* DEPRESS START TO READ NEXT CARD. 3A010480
* TO BYPASS COMPARE ERROR WAIT, SEE PRELOAD. 3A010490
* 3A010500
D. RESTART * 1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD 3A010510
* SWITCH SETTINGS, DEPRESS IMMEDIATE 3A010520
* STOP AND RESET PUSH BUTTONS. 3A010530
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS. 3A010540
* 3. DEPRESS START. 3A010550
* 3A010560
E. COMMENTS * 1. LAST DSW SENSED IS DISPLAYED IN THE Q REG. 3A010570
* 2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON 3A010580
* OR TO BYPASS THE INTERRUPT WAIT, LOAD /6010 3A010590
* INTO LOCATION /0037 AND DO A PROGRAM RESTART. 3A010600
* 3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6010 3A010610
* INTO LOCATION /0037 AND LOAD /1000 INTO 3A010620
* LOCATION /003A AND DO A PROGRAM RESTART. 3A010630
* 3A010640
***** 3A010650
ORG 0 3A010660
0000 0 601F RDBGN LDX RDBLD *A* TO /6020 LDX RDRST 3A010670
0001 0 00FF RDARA DC /00FF READ IN AREA 3A010680
0002 0 0006 RDBSW DC RDDS 3A010690
0003 0 003A DC /003A *A* TO /3A00 RD BIT WSW 3A010700
0004 0 0001 RDRRD DC RDARA READ IN AREA ADDR 3A010710
0005 0 0012 DC /0012 *A* TO /1200 XIO READ 3A010720
0006 0 602D RDDSW LDX RDRST BIT SW SAVE AREA 3A010730
0007 0 8818 DC /8818 *A* TO /1703 XIO SENSE 3A010740
0008 0 000F RDRGO DC RDIO4 INTERRUPT ADDR 3A010750
0009 0 2808 DC /2808 *A* TO /1404 XIO START 3A010760
000A 0 0000 RDERR DC *-* LAST RDR COMPARE FRR 3A010770
000B 0 0000 RDDSV DC *-* LAST DSW SENSED 3A010780
000C 0 000F DC RDIO4 INTERRUPT ADDR 3A010790
000D 0 00FF RDOFF DC /00FF CONSTANT /00FF 3A010800
000E 0 0001 RDDONE DC 1 CONSTANT 1 3A010810
000F 0 0000 RDIO4 DC *-* INTERRUPT ENTRY 3A010820
0010 0 08F5 XIO RDDS 3A010830
0011 0 00F9 STO RDDS 3A010840
0012 0 4850 ROSC - CK FOR RD RESPONSE 3A010850
0013 0 7024 MDX RDCOP NO, CK OP COMPLETE 3A010860
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```
0014 0 08FF XIO RDRRD YES, READ COLUMN 3A010870
0015 0 C0F0 LD RDDS CK IF COMPARE TO SWS 3A010880
0016 0 1804 SRA 4 * 3A010890
0017 0 1004 SLA 4 * 3A010900
0018 0 F0E8 EDR RDARA * 3A010910
0019 0 4818 BSC &- * 3A010920
001A 0 701C MDX RDINT YES, WAIT NXT INTRPT 3A010930
001B 0 C0E5 LD RDARA NO,SAVE COL READ 3A010940
001C 0 D0ED STO RDERR * 3A010950
001D 0 6802 STX RDES SET ERR SW 3A010960
001E 0 7018 MDX RDINT WAIT FOR NXT INTRPT 3A010970
001F 0 C0E3 RDBLD LD RDBSW&1 BUILD IOCCS AND 3A010980
0020 0 1008 RDES SW 9 * RESET/START BRANCH 3A010990
0021 0 D0E1 STO RDBSW&1 * 3A011000
0022 0 C0E4 LD RDDS&1 * 3A011010
0023 0 1803 SRA 3 * 3A011020
0024 0 D0E2 STO RDDS&1 * 3A011030
0025 0 C0F3 LD RDRGO&1 * 3A011040
0026 0 1801 SRA 1 * 3A011050
0027 0 D0E1 STO RDRGO&1 * 3A011060
0028 0 C0DC LD RDRRD&1 * 3A011070
0029 0 1008 SLA 8 * 3A011080
002A 0 D0DA STO PDRRD&1 * 3A011090
002B 0 C0DA LD RDDS * 3A011100
002C 0 D0D3 STO RDBG * 3A011110
002D 0 0804 RDRST XIO RDBSW READ SWS DELAY/OPT 3A011120
002E 0 C0D7 LD RDDS * SAVE DELAY/OPTION 3A011130
002F 0 D0EF STO RDBLD * 3A011140
0030 0 3001 WAIT 1 SET READ PATTERN 3A011150
0031 0 C0DB LD RDOFF * 3A011160
0032 0 D0CE STO RDARA * 3A011170
0033 0 1010 SLA 16 INITIALIZE AND READ 3A011180
0034 0 D0EB STO RDES * BIT SWS 3A011190
0035 0 08CC XIO RDBSW * 3A011200
0036 0 0AD1 XIO RDRGO START READER 3A011210
0037 0 3004 RDRINT WAIT 4 WAIT FOR INTERRUPT 3A011220
0038 0 1004 RDCOP SLA 4 CK FOR OP COMPLETE 3A011230
0039 0 4850 ROSC - * 3A011240
003A 0 70D5 MDX RDIO4&1 NO, RESENSE DSW 3A011250
003B 0 C8CE LDD RDDS-1 YES, LOAD DSW IN Q 3A011260
003C 0 C0E2 LD RDBLD SET UP DELAY 3A011270
003D 0 1801 SRA 1 * 3A011280
003E 0 90CF RDLDP S RDDONE * 3A011290
003F 0 4810 BSC - * 3A011300
0040 0 70FD MDX RDLDP * 3A011310
0041 0 C0DE LD RDFS CK IF FRR SW ON 3A011320
0042 0 4318 BSC &- * 3A011330
0043 0 70ED MDX RDRST&4 NO, RD NXT CARD 3A011340
0044 0 C0DA LD RDBLD YES, CK IF LOOP 3A011350
0045 0 100F SLA 15 * ON ERROR(BIT 15) 3A011360
0046 0 4820 BSC Z * 3A011370
0047 0 70ED MDX RDINT-2 YES, RD BIT SWS 3A011380
0048 0 C8C1 LDD RDDS-1 NO, DISPLAY RD FRR 3A011390
0049 0 3006 WAIT 6 * AND DSW AT WAIT 6 3A011400
004A 0 70E6 MDX RDRST&4 RD NEXT CARD 3A011410
***** 3A011420
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A011430
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A011440
004D 0 2000 DC /2000 * IDENTIFICATION, THREE 3A011450
004E 0 2000 DC /2000 * FOR THE PID AND TWO FOR 3A011460
004F 0 0004 DC /0004 * SFQUFNCE. 3A011470
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***** 3A011490
* 3A011500
6.08 2310 DISK SEEK * 1. THE PROGRAM ALLOWS THE HEAD TO ACCESS BACK
* AND FORTH BETWEEN 2 CYLINDERS WHICH ARE
* CONTROLLED BY THE OPERATOR. 3A011510
* 3A011520
* 2. AN OPTION IS AVAILABLE TO ALLOW A WAIT AFTER 3A011530
* EACH SEEK OPERATION. 3A011540
* 3A011550
* 3. THE PROGRAM CAN BE USED TO POSITION THE HEAD 3A011560
* BEFORE LOADING THE 2310 WRT/RD/COMPARE 3A011570
* PROGRAM. 6.09 3A011580
* 3A011590
A. PRELOAD SWS * 1. SET DESIRED DISK DRIVE AREA CODE IN BIT
* SWITCHES 0 THRU 7. 3A011600
* 3A011610
* DRIVE 0 --- 20XX 3A011620
* DRIVE 1 --- 88XX 3A011630
* DRIVE 2 --- 90XX 3A011640
* DRIVE 3 --- 98XX 3A011650
* DRIVE 4 --- A0XX 3A011660
* 2. IF WAIT AFTER EACH SEEK OPERATION IS DESIRED, 3A011670
* SET BIT SWITCH 15 ON. 3A011680
* 3A011690
B. LOADING * LOAD IPL FROM CARD OR PAPER TAPE. 3A011700
* 3A011710
C. WAITS 1 * SET DESIRED HEX CYLINDER ADDRESS IN BIT
* SWITCHES 0 THRU 7. SEE PAGE 2A. 3A011720
* 3A011730
* SET DESIRED HEX NUMBER OF CYLINDERS TO SEEK IN 3A011740
* BIT SWITCHES 8 THRU 15. 3A011750
* DEPRESS START. 3A011760
* 3A011770
5 * NO INTERRUPT GENERATED AFTER INITIAL XIO SEEK 3A011780
* HOME WAS EXECUTED. SEE COMMENTS 3A011790
* 3A011800
6 * NO INTERRUPT GENERATED AFTER XIO SEEK WAS 3A011810
* EXECUTED. SEE COMMENTS 3A011820
* 3A011830
D. RESTART * 1. TO RESTART PROGRAM OR RESET SWITCH SETTINGS, 3A011840
* DEPRESS IMMEDIATE STOP AND RESET PUSH BUTTONS. 3A011850
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS. 3A011860
* 3. DEPRESS START. 3A011870
* 3A011880
E. COMMENTS * 1. LAST DSW SENSED IS DISPLAYED IN THE Q REG. 3A011890
* 2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON 3A011900
* AND TO BYPASS THE INTERRUPT WAIT, LOAD /6012 3A011910
* INTO LOCATIONS /0039 AND /0041. 3A011920
* DO A PROGRAM RESTART. 3A011930
* 3A011940
***** 3A011950
0000 ORG 0 3A011960
0000 0 601B DKBGN LDX DKBLD *A* TO /6020 LDX DKRST 3A011970
0001 0 0000 DKENT DC *-* INTERRUPT ENTRY SW 3A011980
0002 0 000E DKBSW DC DKBIT BIT SW SAVE 3A011990
0003 0 003A DC /003A *A* TO /3A00 RD BIT SWS 3A012000
0004 0 00CA DKHME DC 202 MAX NUMBER OF SEEKS 3A012010
0005 0 0000 DC *-* IOCC-SEEK HOME 3A012020
0006 0 0000 DKSEK DC *-* NUMBER OF SFEKS 3A012030
0007 0 0000 DC *-* IOCC-SEEK 3A012040
0008 0 0000 DKDSW DC *-* AREA CODE/SW OPTIONS 3A012050
0009 0 0000 DC *-* IOCC-SENSE RESET DSW 3A012060
000A 0 0011 DC DKIN2 INTERRUPT ADDRESS 3A012070
000B 0 0000 DKDSV DC *-* LAST DSW 3A012080
000C 0 0004 DK004 DC /0004 CONSTANT 4 3A012090
000D 0 00FF DKOFF DC /00FF CONSTANT FF 3A012100
000E 0 6020 DKBIT LDX DKRST RESET VECTOR 3A012110
000F 0 7010 DKBD1 DC /7010 DSW BUILD WORD 3A012120
0010 0 0808 DKBD2 DC /0808 SEEK BUILD WORD 3A012130
0011 0 0000 DKIN2 DC *-* OP COMPLETE INTRPT 3A012140
0012 0 08F5 XIO DKDSW SENSE RESET DSW 3A012150
0013 0 D0F7 STO DKDSV SAVE DSW 3A012160

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0014 0 1002 SLA 2 CK RDY, NOT BUSY 3A012170
0015 0 4868 BOSC &Z * 3A012180
0016 0 6012 LDX DKIN2&1 NO, LOOP 3A012190
0017 0 C0E9 LD DKENT LD INTERRUPT ENTRY SW 3A012200
0018 0 4820 BSC Z CHECK IF ON 3A012210
0019 0 7020 MDX DKMOV NO, SEEK HOME ENTRY 3A012220
001A 0 7027 MDX DKCON YES, SEEK ENTRY 3A012230
001B 0 C0F2 DKBLD LD DKBIT BUILD RD BIT SW IOCC 3A012240
001C 0 D0E3 STO DKBGN * AND SET PRG RESET 3A012250
001D 0 C0E5 LD DKBSW&1 * AND START VECTOR 3A012260
001E 0 1008 SLA 8 * 3A012270
001F 0 D0E3 STO DKBSW&1 * 3A012280
0020 0 08E1 DKRST XIO DKBSW RD AREA CODE AND 3A012290
0021 0 C0EC LD DKBIT * PROG OPTIONS 3A012300
0022 0 D0E5 STO DKDSW SAVE SWS 3A012310
0023 0 180B SRA 11 SET UP AREA CODE 3A012320
0024 0 100B SLA 11 * 3A012330
0025 0 D0E8 STO DKBIT SAVE AREA CODE 3A012340
0026 0 C0E8 LD DKBD1 BUILD DSW AND SFEK 3A012350
0027 0 1804 SRA 4 * IOCCS 3A012360
0028 0 E8E5 OR DKBIT * 3A012370
0029 0 D0DF STO DKDSW&1 * 3A012380
002A 0 C0E5 LD DKBD2 * 3A012390
002B 0 1801 SRA 1 * 3A012400
002C 0 E8E1 OR DKBIT * 3A012410
002D 0 D0D7 STO DKHME&1 * 3A012420
002E 0 D0D8 STO DKSEK&1 * 3A012430
002F 0 3001 WAIT 1 SET STARTING CYL. 3A012440
0030 0 08D1 XIO DKPSW * AND NUM OF CYLS. 3A012450
0031 0 C0DC LD DKRIT * TO SEEK IN BIT SWS 3A012460
0032 0 1808 SRA 8 SFT UP START CYL. 3A012470
0033 0 D0D2 STO DKSEK * 3A012480
0034 0 08D3 XIO DKDSW SENSE DSW 3A012490
0035 0 D0D5 STO DKDSV SAVE DSW 3A012500
0036 0 C8D3 LDD DKDSV-1 LOAD DSW IN Q REG 3A012510
0037 0 68C9 STX DKENT TURN ON INTRPT ENTRY SW 3A012520
0038 0 08CB XIO DKHME SEEK HOME 3A012530
0039 0 3005 WAIT 5 WAIT FOR INTERRUPT 3A012540
003A 0 C0CC DKMOV LD DKSEK&1 SET UP SEEK 3A012550
003B 0 F0D0 EOR DK004 * DIRECTION 3A012560
003C 0 D0CA STO DKSEK&1 * 3A012570
003D 0 C8CC LDD DKDSV-1 LOAD DSW IN Q REG 3A012580
003E 0 1010 SLA 16 TURN OFF INTERRUPT 3A012590
003F 0 D0C1 STO DKENT * ENTRY SW 3A012600
0040 0 08C5 XIO DKSEK SEEK 3A012610
0041 0 3006 WAIT 6 WAIT FOR INTERRUPT 3A012620
0042 0 C0CB DKCON LD DKBIT SET UP NUM OF SEEKS 3A012630
0043 0 F0C9 AND DKOFF * 3A012640
0044 0 D0C1 STO DKSEK * 3A012650
0045 0 C0C2 LD DKDSW CK FOR SEEK AND WAIT 3A012660
0046 0 4804 BSC E * 3A012670
0047 0 3002 WAIT 2 YES, WAIT 3A012680
0048 0 70F1 MDX DKMOV NO, GO SEEK 3A012690
***** 3A012700
0049 0 0000 DC 0 SPACE FILLER 3A012710
004A 0 0000 DC 0 * 3A012720
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A012730
004C 0 0000 DC /9000 * USED FOR PROGRAM 3A012740
004D 0 2000 DC /2000 * IDENTIFICATION. THREE 3A012750
004E 0 2000 DC /2000 * FOR THE PID AND TWO FOR 3A012760
004F 0 0002 DC /0002 * SEQUENCE. 3A012770

```

```
***** 3A012790
* 3A012800
6.09 2310 WRITE- 3A012810
READ-COMPARE * 3A012820
* 3A012830
* 3A012840
* 3A012850
* 3A012860
* 3A012870
* 3A012880
* 3A012890
* 3A012900
A. PRELOAD SWS * 3A012910
* 3A012920
* 3A012930
* 3A012940
* 3A012950
* 3A012960
* 3A012970
* 3A012980
* 3A012990
C. WAITS 1 * 3A013000
* 3A013010
* 3A013020
* 3A013030
* 3A013040
* 3A013050
* 3A013060
* 3A013070
* 3A013080
* 3A013090
* 3A013100
* 3A013110
* 3A013120
* 3A013130
* 3A013140
* 3A013150
* 3A013160
* 3A013170
* 3A013180
* 3A013190
* 3A013200
* 3A013210
* 3A013220
* 3A013230
* 3A013240
* 3A013250
* 3A013260
* 3A013270
* 3A013280
* 3A013290
***** 3A013300
* 3A013310
* 3A013320
* 3A013330
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* 3A013930
* 3A013940
* 3A013950
* 3A013960
* 3A013970
* 3A013980
* 3A013990
* 3A014000
* 3A014010
* 3A014020
* 3A014030
* 3A014040
* 3A014050
* 3A014060
* 3A014070
* 3A014080
* 3A014090
* 3A014100
* 3A014110
* 3A014120
* 3A014130
* 3A014140
```

```
0000
0000 0 6020
0001 0 0000
0002 0 003A
0003 0 0000
0004 0 6000
0005 0 7010
0006 0 2820
0007 0 00C3
0008 0 0001
0009 0 0000
000A 0 000B
000B 0 0000
000C 0 083F
000D 0 1001
000E 0 1001
```

```
ORG 0
DCBGN LDX DCBLD GO TO PROG
DCSWS DC *-* SW READ IN AREA
DCON5 DC /003A CONSTANT
DCXR3 DC *-* INDEX REG 3
DCON1 DC /6000 CONSTANT
DC CON2 DC /7010 CONSTANT
DC CON2 DC /2820 CONSTANT
DC CON2 DC /00C3 CONSTANT
DCBSW DC DC SWS SW READ IN ADRS
DC CON2 DC /0000 *A* DC /3A00 READ BIT SWS
DC CON2 DC DCINT INTERRUPT ADRS
DCINT DC *-* INTERRUPT ENTRY
DC CON2 DC DCDSW SENSE DSW
DCON3 SLA 1 ALSO A CONSTANT
DC CON2 DC SLA 1 *
```

```
000F 0 4868 BOSC &Z IS DISK READY
0010 0 600C LDX DCINT&1 * NO
0011 0 C03A LD DCDSW * YES
0012 0 4818 BSC &- WAS LAST OP A READ
0013 0 7034 MDX DC6 * NO
0014 0 0000 DC5 DC /0000 *A* LD 3 1
0015 0 FOEB EOR DC SWS COMPARE SWS
0016 0 4820 BSC Z ANY ERRORS
0017 0 3006 WAIT 6 * YES
0018 0 COEA LD DCXR3 ADJ I/O ADRS
0019 0 80FE A DCBSW *
001A 0 D0E8 STO DCXR3 *
001B 0 F02F FOR DCEND *
001C 0 4820 BSC Z REACHED LIMIT
001D 0 70F6 MDX DC5 * NO
001E 0 3002 WAIT 2 ONE PASS COMPLETE
001F 0 701C MDX DC1 START OVER
* INITIALIZATION
DCBLD LD DCON5 GET CONSTANT
0020 0 C0E1 SLA 8
0021 0 1008 STO DCBSW&1 READ BIT SW IOCC
0022 0 D0E6 XIO DCBSW READ SWS
0023 0 08F4 LDD DC SWS GET AREA CODE
0024 0 C8DC RTE 12 A- /000X Q- /000X
0025 0 18CC AD DC ON1 A- /600X Q- /701X
0026 0 88DD RTE 4 A- /X600 Q- /X701
0027 0 18C4 STO DCDSW SET DSW IOCC
0028 0 D823 RTE 16 A- /X701 Q- /X600
0029 0 18D0 LD DC ON1 A- /6000 Q- /X600
002A 0 C0D9 SRA 8 A- /0060 Q- /X600
002B 0 1808 STO DCRD SET READ IOCC
002C 0 D821 RTE 11 A- /C000 Q- /0C0X
002D 0 18CB EOR DC ON1 A- /A000 Q- /0C0X
002E 0 F0D5 RTE 21 A- /0060 Q- /X500
002F 0 18D5 STO DCWR SET WRITE IOCC
0030 0 D81F LDD DC ON2 A- /2820 Q- /00C3
0031 0 C8D4 SRA 5 A- /0141 Q- /00C3
0032 0 1805 STO /0060 SET WORD COUNT
0033 0 D02C A DCWR A- /01A1 Q- /00C3
0034 0 801B STO DCXR3 SET INDEX REG 3
0035 0 D0C0 STO DCEND SFT LIMIT CNTL
0036 0 D014 RTE 8 A- /C301 Q- /A100
0037 0 18C8 STO DC5 SET LD 3 1
0038 0 D0DB EOR DC ON3 A- /D300 Q- /A100
0039 0 F0D3 STO DC3 SET STO 3 0
003A 0 D0D3 WAIT 1 SET DATA PATTERN
003B 0 3001 DC1 XIO DCBSW READ BIT SWS
003C 0 88CB LD DC SWS GET BIT SWS
003D 0 C0C3 DC3 DC /0000 *A* STO 3 0
003E 0 0000 LD DCXR3 ADJ I/O ADRS
003F 0 C0C3 S DCBSW *
0040 0 90C7 STO DCXR3 *
0041 0 D0C1 FOR DCWR
0042 0 F00D BSC Z REACHED LIMIT
0043 0 4820 MDX DC3-1 * NO
0044 0 70F8 STO DCDSW * YES, CLEAR SW
0045 0 D006 XIO DCWR WRITE A RECORD
0046 0 0809 WAIT 3 WAIT FOR WRITE INTR
0047 0 3003 DC6 STX DCDSW SET SWITCH
0048 0 6803 XIO DCRD READ A RECORD
0049 0 0804 WAIT 4 WAIT FOR READ INTR
004A 0 3004 *****
004B 0 0040 DCEND DC /0040 THE NEXT FIVE WORDS ARE
004C 0 9000 DCDSW DC /9000 * USED FOR PROGRAM
004D 0 2000 DC /2000 * IDENTIFICATION. THREE
004E 0 2000 DCRD DC /2000 * FOR THE PID AND TWO FOR
004F 0 0001 DC /0001 * SEQUENCE.
0050 0 DCWR EQU DCRD&2 3A014140
```


1130 SCOPE LOOP PROGRAMS

```

***** 3A014160
* 3A014170
6.10 1627 PLOTTER * 1. THE PROGRAM EXECUTES ALTERNATE FUNCTIONS
* WHICH HAVE BEEN SELECTED IN THE BIT SWS 3A014180
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE 3A014190
* DELAY BETWEEN XIO WRITE EXECUTIONS. 3A014200
* 3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM 3A014210
* AFTER THE COMPLETION OF THE EXECUTION OF 3A014220
* AN ALTERNATE XIO SEQUENCE. 3A014230
* 3A014240
* 3A014250
A. PRELOAD SWS * 1. IF DELAY IS DESIRED, SET DELAY CONTROL 3A014260
* VALUE IN BIT SWITCHES 1 THRU 13. 3A014270
* *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY. 3A014280
* SWS 1 THRU 13 ALL OFF, NO DELAY. 3A014290
* 2. IF A WAIT AFTER EACH PROGRAM PASS IS 3A014300
* DESIRED, TURN ON BIT SWITCH 15. 3A014310
* 3A014320
B. LOADING * LOAD IPL FROM CARD OR PAPER TAPE. 3A014330
* 3A014340
C. WAITS 1 * SET DESIRED FUNCTION CODES IN BIT SWITCHES 3A014350
* 0 THRU 15. SEE PAGE 2A FOR BIT SW CODES. 3A014360
* 1ST FUNCTION CODE IN SWS 0 THRU 5. 3A014370
* 2ND FUNCTION CODE IN SWS 8 THRU 13. 3A014380
* TURN ON PLOTTER AND MAKE READY. 3A014390
* DEPRESS START. 3A014400
* 3A014410
2 * NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN 3A014420
* SELECTED. DEPRESS START TO MAKE ANOTHER PASS. 3A014430
* 3A014440
3 * NO INTERRUPT GENERATED AFTER XIO WRITE 3A014450
* COMMAND WAS GIVEN. SEE COMMENTS. 3A014460
* 3A014470
D. RESTART * 1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD 3A014480
* SWITCH SETTINGS, DEPRESS IMMEDIATE 3A014490
* STOP AND RESET PUSH BUTTONS. 3A014500
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS. 3A014510
* 3. DEPRESS START. 3A014520
* 3A014530
E. COMMENTS * 1. LAST DSW SENSED IS DISPLAYED IN THE Q REG. 3A014540
* 2. IF NO FUNCTION ENTERED IN BIT SWS, PROGRAM 3A014550
* STOPS AT WAIT 1. 3A014560
* 3. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON 3A014570
* OR TO BYPASS THE INTERRUPT WAIT, LOAD /600D 3A014580
* INTO LOCATION /0034 AND DO A PROGRAM RESTART. 3A014590
* 4. TO SET UP LOOP TO EXECUTE XIO, LOAD /600D 3A014600
* INTO LOCATION /0034 AND LOAD /6035 INTO 3A014610
* LOCATION /0010 AND DO A PROGRAM RESTART. 3A014620
* 3A014630
***** 3A014640
0000 ORG 0 3A014650
0000 0 6012 PLBGN LDX PLBLD *A* TO /601E LDX PLRDS 3A014660
0001 0 0001 PLONE DC 1 CONSTANT ONE 3A014670
0002 0 0006 PLBSW DC PLDSW BIT SW SAVE AREA 3A014680
0003 0 003A DC /003A *A* TO /3A00 RD BIT SWS 3A014690
0004 0 0006 PLOT DC PLDSW CHARACTER ADDRESS 3A014700
0005 0 0029 DC /0029 *A* TO /2900 XIO WRITE 3A014710
0006 0 0000 PLDSW DC *-* BIT SW READIN AREA 3A014720
0007 0 002F DC /002F *A* TO /2F01 XIO SENSE 3A014730
0008 0 601F PLRST LDX PLRDS RESET START MOD 3A014740
0009 0 0000 PLDSV DC *-* DSW SAVE AREA 3A014750
000A 0 0000 PLSET DC *-* SW OPTION/DELAY SAVE 3A014760
000B 0 000C DC PLIN3 INTERRUPT ADDRESS 3A014770
000C 0 0000 PLIN3 DC *-* INTERRUPT LEVEL 3 3A014780
000D 0 08F8 XIO PLDSW SENSE RESET DSW 3A014790
000E 0 0DFA STO PLDSV SAVE DSW 3A014800
000F 0 4850 BOSC - RESET INT LEVEL 3A014810
0010 0 70FC MDX PLIN3&1 RESENSE DSW 3A014820
0011 0 7023 MDX PLRET BRANCH TO DELAY 3A014830

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0012 0 C0F2 PLBLD LD PLOT&1 BUILD WRITE IOCC 3A014840
0013 0 1008 PLCTL SLA 8 * 2ND CHAR SW 3A014850
0014 0 0D0F STO PLOT&1 * 3A014860
0015 0 C0F1 LD PLDSW&1 BUILD SENSE RESET 3A014870
0016 0 1008 SLA 8 * 3A014880
0017 0 E8E9 OR PLONE * 3A014890
0018 0 D0EE STO PLDSW&1 * 3A014900
0019 0 C0E9 LD PLBSW&1 BUILD READ BIT SW 3A014910
001A 0 1008 SLA 8 * IOCC 3A014920
001B 0 D0E7 STO PLBSW&1 * 3A014930
001C 0 C0EB LD PLRST SET UP RESET AND 3A014940
001D 0 D0E2 STO PLBGN * START BRANCH 3A014950
001E 0 08E3 PLRDS XIO PLBSW READ BIT SWS FOR 3A014960
001F 0 C0E6 LD PLDSW * PROG OPTS/DELAY 3A014970
0020 0 D0E9 STO PLSET * 3A014980
0021 0 3001 WAIT 1 SET CHARS IN SWS 3A014990
0022 0 08DF PLSTR XIO PLBSW READ BIT SWS 3A015000
0023 0 C0E2 LD PLDSW CK FOR NO COMMAND 3A015010
0024 0 180A SRA 10 * ENTERED 3A015020
0025 0 4808 BSC 8 * 3A015030
0026 0 70FA MDX PLSTR-1 * NO, SENSE SWS 3A015040
0027 0 C0DE LD PLDSW * 3A015050
0028 0 1008 SLA 8 * 3A015060
0029 0 180A SRA 10 * 3A015070
002A 0 4808 BSC 8 * 3A015080
002B 0 70F5 MDX PLSTR-1 * NO, SENSE SWS 3A015090
002C 0 C8DB PLSEN LDD PLDSV-1 LOAD LAST DSW IN Q . 3A015100
002D 0 08D8 XIO PLDSW CHK DEVICE NOT BUSY 3A015110
002E 0 D0DA STO PLDSV SAVE DSW 3A015120
002F 0 1004 SLA 4 * 3A015130
0030 0 4828 BSC 8Z * 3A015140
0031 0 70FA MDX PLSEN * 3A015150
0032 0 C8D5 LDD PLDSV-1 LOAD LAST DSW IN Q . 3A015160
0033 0 08D0 XIO PLOT WRITE CHARACTER 3A015170
0034 0 3003 WAIT 3 WAIT FOR INTERRUPT 3A015180
0035 0 C8D2 PLRET LDD PLDSV-1 LOAD LAST DSW IN Q . 3A015190
0036 0 C0D3 LD PLSET SET UP DELAY AND 3A015200
0037 0 1801 SRA 1 * EXECUTE DELAY 3A015210
0038 0 90C8 PLLOP S PLONE * 3A015220
0039 0 4810 BSC - * 3A015230
003A 0 70FD MDX PLLOP * 3A015240
003B 0 C0CA LD PLDSW LD, SET UP 2ND CHAR 3A015250
003C 0 4804 BSC 8 CHK IF WAIT REQUESTED 3A015260
003D 0 3002 WAIT 2 YES 3A015270
003E 0 1802 SRA 2 NO, CHK 2ND CHAR OK 3A015280
003F 0 4818 BSC 8- * 3A015290
0040 0 70E0 MDX PLSTR-1 NO, GO TO WAIT 1 3A015300
0041 0 100A SLA 10 YES, SET UP 2ND CHAR 3A015310
0042 0 D0C3 STO PLDSW * 3A015320
0043 0 C0CF LD PLCTL CHK IF 2ND CHAR SW 3A015330
0044 0 4820 BSC 2 * OFF 3A015340
0045 0 7002 MDX PLALT NO, BRANCH 3A015350
0046 0 68CC STX PLCTL YES, SET 2ND CHAR SW 3A015360
0047 0 70DA MDX PLSTR GO LOOP PROGRAM 3A015370
0048 0 1010 PLALT SLA 16 CLR 2ND CHAR SW 3A015380
0049 0 D0C9 STO PLCTL * 3A015390
004A 0 70E1 MDX PLSEN GO CHK IF PRINT BUSY 3A015400
***** 3A015410
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A015420
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A015430
004D 0 2000 DC /2000 * IDENTIFICATION. THREE 3A015440
004E 0 1000 DC /1000 * FOR THE PID AND TWO FOR 3A015450
004F 0 2000 DC /2000 * SEQUENCE. 3A015460

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*****
6.11 2501 READER
* 1. THE PROGRAM READS 80 COLUMNS OF DATA AND
*   COMPARES EACH WORD WITH THE BIT SWITCHES.
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE
*   DELAY BETWEEN XIO READ EXECUTIONS.
* 3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6
*   ON COMPARE ERRORS.
A. PRELOAD SWS
* 1. IF DELAY IS DESIRED, SFT DELAY CONTROL
*   VALUE IN BIT SWITCHES 1 THRU 13.
*   *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.
*   SWS 1 THRU 13 ALL OFF, NO DELAY.
* 2. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS
*   DESIRED, TURN ON BIT SWITCH 15.
B. LOADING
* LOAD IPL FROM CARD OR PAPER TAPE.
C. WAITS
1 * SFT BIT SWS 0 THRU 11 TO EXPECTED COLUMN
* DATA AND SET BITS 12 THRU 15 OFF.
* LOAD PREPUNCHED CARDS INTO READER AND MAKE READY.
* DEPRESS START.
4 * NO INTERRUPT GENERATED AFTER XIO READ.
* COMMAND WAS GIVEN. SEE COMMENTS.
6 * COMPARE ERROR. ACCUMULATOR CONTAINS BITS READ.
* IF ACCUMULATOR CONTAINS /DOCB, COLUMN READ WAS
* NOT STORED INTO READ/IN AREA.
* DEPRESS START TO COMPARE NEXT COLUMN.
* TO BYPASS COMPARE ERROR WAIT, SEE PRELOAD.
D. RESTART
* 1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD
*   SWITCH SETTINGS, DEPRESS IMMEDIATE
*   STOP AND RESET PUSH BUTTONS.
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.
* 3. DEPRESS START.
E. COMMENTS
* 1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.
* 2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON
*   OR TO BYPASS THE INTERRUPT WAIT, LOAD /600F
*   INTO LOCATION /002F AND DO A PROGRAM RESTART.
* 3. TO SET UP LOOP TO EXECUTE XIO, LOAD /600F
*   INTO LOCATION /002F AND LOAD /6027 INTO
*   LOCATION /0013 AND DO A PROGRAM RESTART.
*****
0000          CRG          0
0000 0 6035   CRBGN LDX   CRBLD  *A* TO /6030 LDX CRRST
0001 0 0001   CRONE DC    I      CONSTANT 1
0002 0 0004   CRBSW DC    CRDSW  BIT SW SAVE ADDR
0003 0 003A   DC          /003A  *A* TO /3A00 RD BIT SWS
0004 0 6030   CRDSW LDX   CRRST  BIT SW SAVE AREA
0005 0 0027   DC          /0027  *A* TO /4F01 XIO SENSE DSW
0006 0 0036   CRRDR DC    CRARA  CARD READ IN ADDR
0007 0 0027   DC          /0027  *A* TO /4E00 XIO START RDR
0008 0 00FF   CRERR DC    /00FF  SAVE READ ERROR
0009 0 0000   CRDSV DC    *-*    LAST DSW SENSED
000A 0 0000   CREND DC    *-*    *A* TO /D11A END OF RD AREA
000B 0 C022   CRSRA DC    /C022  LD READ AREA
000C 0 000E   DC          CRIN4  INTERRUPT ADDR
000D 0 0005   CROB0 DC    /0005  *A* TO /0050 CONSTANT 80
000E 0 0000   CRIN4 DC    *-*    INTERRUPT ENTRY
000F 0 08F4   XIO        CRDSW  SENSE DSW
0010 0 00F8   STO        CRDSV  SAVE DSW
0011 0 1004   SLA        4      CK FOR OP COMPLETE
0012 0 4850   BOSC      -      *
0013 0 70FB   MDX        CRIN4&1 NO, RESENSE DSW

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0014 0 C022   CRLD LD    CRARA&1  LOAD COLUMN READ
0015 0 00F2   STO      CRERR  SAVF BITS READ
0016 0 00ED   FOR      CRDSW  COMPARE WITH PATT WD
0017 0 4818   BSC      &-      CK FOR COMPARE ERR
0018 0 7006   MDX      CRMOD  NO, SET UP NEXT CHK
0019 0 C01B   LD        CRBLD  YES, CK LOOP OPT
001A 0 100F   SLA      15      *
001B 0 4828   BSC      &Z      *
001C 0 700A   MDX      CRLOP-3 LOOP ERR OPTION ON
001D 0 C8FA   LDD      CRERR  LD DSW AND ERR BITS
001E 0 3006   WAIT     6      COMPARE ERROR WAIT
001F 0 C0F4   CRMOD LD    CRLD   SET UP NEXT COMPARE
0020 0 80E0   A        CRONE  *
0021 0 00F2   STO      CRLD   *
0022 0 90E7   S        CREND  CK IF ALL COLUMNS
0023 0 4828   BSC      &Z      * CHECKED
0024 0 70EF   MDX      CRLD   NO, COMPARE NXT COL
0025 0 C0F5   LD        CRSRA  SET UP FOR NXT CARD
0026 0 00ED   STO      CRLD   *
0027 0 C8E0   LDD      CRERR  LOAD LAST DSW IN Q
0028 0 C00C   LD        CRBLD  SET UP DELAY
0029 0 1801   SRA      1      *
002A 0 90D6   CRLDP S    CRONE  *
002B 0 4810   BSC      -      *
002C 0 70FD   MDX      CRLDP  *
002D 0 08D4   CRSTR XIO  CRBSW  RD BIT SWS PATT WD
002E 0 08D7   XIO      CRRDR  READ A CARD
002F 0 3004   WAIT     4      WAIT FOR INTERRUPT
0030 0 08D1   CRRST XIO  CRBSW  RD SWS FOR DELAY/OPT
0031 0 C0D2   LD        CRDSW  SAVF DELAY/OPTIONS
0032 0 D002   STO      CRBLD  *
0033 0 3001   WAIT     1      SET PATTERN IN SWS
0034 0 70F8   MDX      CRSTR  GO READ BIT SWS
0035 0 C0CD   CRBLD LD  CRBSW&1 BUILD PROGRAM
0036 0 1008   CRARA SLA  8      *A* TO /0050 WD CNT RD
0037 0 00CB   STO      CRBSW&1 *A* TO *-* READ/IN AREA
0038 0 C0CB   LD        CRDSW  *
0039 0 00C6   STO      CRBGN  *
003A 0 C0CA   LD        CRDSW&1 *
003B 0 1001   SLA      1      *
003C 0 8BC4   OR       CRONE  *
003D 0 1008   SLA      9      *
003E 0 8BC2   OR       CRONE  *
003F 0 00C5   STO      CRDSW&1 *
0040 0 C0C6   LD        CRRDR&1 *
0041 0 1009   SLA      9      *
0042 0 00C4   STO      CRRDR&1 *
0043 0 C0C9   LD        CROB0  *
0044 0 1004   SLA      4      *
0045 0 00F0   STO      CRARA  *
0046 0 80C4   A        CRSRA  *
0047 0 00C2   STO      CREND  *
0048 0 70E7   MDX      CRRST  EXECUTE PROGRAM
*****
0049 0 0000   DC        0      SPACE FILLER
004A 0 0000   DC        0      *
004B 0 0040   DC        /0040 THE LAST FIVE WORDS ARE
004C 0 9000   DC        /9000 * USED FOR PROGRAM
004D 0 2000   DC        /2000 * IDENTIFICATION. THREE
004E 0 1000   DC        /1000 * FOR THE PID AND TWO FOR
004F 0 1000   DC        /1000 * SEQUENCE.

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1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

6.12 1403 PRINTER

A. PRELOAD SWS

B. LOADING

C. WAIT

D. RESTART

E. COMMENTS

```

***** 3A016780
* 3A016790
* THIS PROGRAM WILL PRINT ANY CHARACTER ENTERED 3A016800
* IN THE BIT SWITCHES 1-7 AND 9-15. IF BIT 14 IS ON 3A016810
* THE BIT SWS 1-12 WILL BE THE CHANNEL THAT THE 3A016820
* CARRIAGE WILL SKIP TO AFTER PRINTING. 3A016830
* 3A016840
* BIT SW 15- HALT AFTER ONE PASS. 3A016850
* 14- CARR SKIP FUNCTION. 3A016860
* 1 THRU 12- CHANNEL NUMBER TO USE FOR SKIP. 3A016870
* 3A016880
* IPL MODE FROM CARDS OR PAPER TAPE. 3A016890
* 3A016900
* SET CHARACTER TO PRINT, 1-7 AND 9-15. 3A016910
* 3A016920
* ONE PASS COMPLETED, PRESS START TO CONTINUE. 3A016930
* 3A016940
* LOST PRINTER INTERRUPT. 3A016950
* 3A016960
* LOST CARRIAGE INTERRUPT. 3A016970
* 3A016980
* 3A016990
* PARITY ERROR FOUND IN THE DSW. 3A017000
* 3A017010
* PRESS IMMEDIATE STOP AND RESFT. PRELOADING 3A017020
* SWITCHES MAY BE SET AS DESIRED. PRESS START. 3A017030
* 3A017040
* 1. TO RUN THE PROG WITH INTERRUPT DELAY SWITCH 3A017050
* ON OR BYPASS THE INTERRUPT WAIT LOAD /601F 3A017060
* INTO LOCATION /001D AND /0030 AND RESTART. 3A017070
* 3A017080
* 2. TO GET A FASTER LOOP THAN THE ABOVE PLACE 3A017090
* /7OFF IN THE NEXT LOCATION AFTER THE XIO. THE 3A017100
* XIO WILL BE EXECUTED AFTER EACH BRANCH. 3A017110
* 3A017120
***** 3A017130
0000 ORG 0 3A017140
0000 0 6033 LDX FPBLD *A* LDX FPSTR 3A017150
0001 0 0000 FPSWS DC *-* BIT SWITCH STG 3A017160
0002 0 0000 FPDSW DC /D000 *A* WORD COUNTER 3A017170
0003 0 F010 DC /F010 *A* DC /AF01 3A017180
0004 0 9000 FPCAR DC /9000 CHANNEL BITS 3A017190
0005 0 C000 DC /C000 *A* DC /AC00 CARR CNTL 3A017200
0006 0 0001 FPRSWS DC FPSWS BIT SW STG ADRS & ONE 3A017210
0007 0 003A DC /003A *A* DC /3A00 READ BIT SWS 3A017220
0008 0 0004 FPSKP DC FPCAR CARR CHAN ADRS 3A017230
0009 0 9000 DC /9000 *A* DC /A900 SKIP IOCC 3A017240
000A 0 0033 FPPRT DC FPOUT&1 PRINT AREA ADRS 3A017250
000B 0 000A DC /000A *A* DC /AD00 PRINT IOCC 3A017260
000C 0 001E DC FPINT INTERRUPT ADRS 3A017270
* 3A017280
* START AND RESTART OF PROGRAM 3A017290
* 3A017300
FPSTR XIO FPBSW READ BIT SWITCHES 3A017310
LD FPSWS GET SW SETTINGS 3A017320
STO FPSWS-3 * AND SAVE 3A017330
SRA 3 3A017340
STO FPCAR SET CHAN NUMBER 3A017350
WAIT 1 SFT CONSOLE SWS 3A017360
FP1 XIO FPBSW READ PRINTER CODE 3A017370
LD FPOUT GET WORD COUNT 3A017380
STO FPDSW LOAD XR 2 3A017390
LD FPSWS GET PRINT CODE 3A017400
FP2 DC /0002 *A* STO 2 FPOUT 3A017410
LD FPDSW GET COUNT AND 3A017420
S FPBSW * SUB ONE 3A017430
BSC Z AREA FILLED 3A017440
MDX FP2-2 * NO 3A017450
XIO FPPRT PRINT A LINE 3A017460

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```

001D 0 3003
001E 0 0000
001F 0 08E2
0020 0 4844
0021 0 601F
0022 0 4828
0023 0 3006
0024 0 1002
0025 0 4810
0026 0 70EC
0027 0 C0D6
0028 0 4804
0029 0 3002
002A 0 100E
002B 0 4810
002C 0 7002
002D 0 08DA
002E 0 7001
002F 0 08D4
0030 0 3005
0031 0 0001
0032 0 003C

```

```

0033 0 C013
0034 0 D0C8
0035 0 C8D5
0036 0 88CD
0037 0 18C4
0038 0 D8CB
0039 0 D0CF
003A 0 C8D0
003B 0 88C6
003C 0 18C4
003D 0 D8C4
003E 0 D0CC
003F 0 C0C7
0040 0 1008
0041 0 D0C5
0042 0 C0D4
0043 0 1008
0044 0 E8C5
0045 0 90EB
0046 0 D0D0
0047 0 600D

```

```

0048 0 0000
0049 0 0000
004A 0 0000
004B 0 0040
004C 0 9000
004D 0 2000
004E 0 1000
004F 0 0800

```

```

WAIT 3 WAIT FOR PRINT INTERRUPT 3A017460
FPINT DC *-* INTERRUPT ENTRY 3A017470
XIO FPDSW SENSE DSW 3A017480
BOSC E IS PRINTER READY 3A017490
LDX FPINT&1 * NO 3A017500
BSC &Z PARITY ERROR 3A017510
WAIT 6 * YES 3A017520
SLA 2 * NO 3A017530
BSC - PRINT COMPLETE 3A017540
MDX FP1 * NO, CARR INTR 3A017550
LD FPSWS-3 GET CONTROLS 3A017560
BSC E HALT ON 3A017570
WAIT 2 * YES 3A017580
SLA 14 * NO 3A017590
BSC - CARR SKIP FUNC 3A017600
MDX FPR * NO 3A017610
XIO FPSKP SKIP TO CHAN 3A017620
MDX FPR&1 GO WAIT INTERRUPT 3A017630
FPR XIO FPCAR * YES, SPACE 3A017640
WAIT 5 WAIT FOR CARR INTR 3A017650
* 3A017660
FP001 DC /0001 CONSTANT 3A017670
FPOUT DC 60 WORD COUNT 3A017680
* 3A017690
* THIS WILL BE THE PRINT AREA AFTER 3A017700
* INITIALIZATION 3A017710
* 3A017720
FPBLD LD FPRFS 3A017730
STO 0 * SET RESTART 3A017740
LDD FPPRT+1 * A- /000A Q- /000A 3A017750
AD FPCAR * A- /C00A Q- /900A 3A017760
RTE 4 * A- /AC00 Q- /A900 3A017770
STO FPCAR * CONTROL IOCC 3A017780
STO FPSKP&1 * SKIP IOCC 3A017790
LDD FPPRT+1 * A- /000A Q- /000A 3A017800
AD FPDSW * A- /D00A Q- /F01A 3A017810
RTE 4 * A- /AD00 Q- /AF01 3A017820
STO FPDSW * SENSE DSW IOCC 3A017830
STO FPPRT&1 * PRINT IOCC 3A017840
LD FPRSWS&1 * 3A017850
SLA 8 * 3A017860
STO FPRSWS&1 * READ BIT SW IOCC 3A017870
LD FP2 * 3A017880
SLA 8 * 3A017890
OR FPPRT * 3A017900
S FP001 ADJUST DISPLACEMENT 3A017910
STO FP2 * BUILD STO 2 FPPRT 3A017920
FPRES LDX FPSTR GO TO PROGRAM 3A017930
***** 3A017940
DC 0 SPACE FILLER 3A017950
DC 0 * 3A017960
DC 0 * 3A017970
DC /0040 THE LAST FIVE WORDS ARE 3A017980
DC /9000 * USED FOR PROGRAM 3A017990
DC /2000 * IDENTIFICATION. THREE 3A018000
DC /1000 * FOR THE PID AND TWO FOR 3A018010
DC /0800 * SEQUENCE. 3A018020

```

```

***** 3A018040
*
6.13 1132 PRINTER * THE CHARACTER ENTERED IN SWS 0-7 IS PRINTED IN
* ALL PRINT POSITIONS. 3A018050
* 3A018060
* 3A018070
* 3A018080
A. PRELOAD SWS * BIT SW 15--HALT AFTER EACH LINE PRINTED. SW 15 3A018090
* ALSO CAUSES ONE EXTRA IDLE SCAN CYCLE. 3A018100
* THIS HAS A NEGLIGIBLE AFFECT ON SPEED. 3A018110
* 8-15--PRINT SPEED CONTROL--ENTER THE 3A018120
* DESIRED NUMBER OF IDLE SCAN CYCLES 3A018130
* TO BE TAKEN BETWEEN PRINT CYCLES. 3A018140
* 0-7=VALID CHARACTER--PRINT CHARACTER AS 3A018150
* SHOWN ON PAGE 2. 3A018160
* 0-7=INVALID CHARACTER--IDLE CONTINUOUSLY. 3A018170
* 3A018180
* NOTE--PROGRAM ALWAYS TURNS ON BIT 10 TO PREVENT 3A018190
* OPERATING AT EXCESSIVE SPEEDS. SPEED MAY 3A018200
* BE INCREASED BY MANUALLY CHANGING CONSTANT 3A018210
* AT CORE LOCATION 0008. USE CAUTION. 3A018220
* 3A018230
* SWITCH SETTINGS MAY BE CHANGED AT ANY TIME. 3A018240
* 3A018250
B. LOADING * IPL MODE FROM CARDS OR PAPER TAPE 3A018260
* 3A018270
C. WAIT 2 * ONE PASS COMPLETED, PRESS START TO CONTINUE. 3A018280
* 3A018290
3 * NO EMITTER RESPONSE INTRPT, RESTART TO CONTINUE 3A018300
* 3A018310
5 * NO SPACE RESPONSE INTERRUPT, RESTART TO CONTINUE 3A018320
* 3A018330
D. RESTART * PRESS IMMEDIATE STOP AND RESET. PRELOADING 3A018340
* SWITCHES MAY BE SET AS DESIRED. PRESS START. 3A018350
* 3A018360
E. COMMENTS * TO RUN WITHOUT INTERRUPTS..MANUALLY ENTER 3A018370
* HEX 6008 AT CORE LOCATIONS 0001 AND 003A. 3A018380
* 3A018390
* TO CHANGE POSITIONS PRINTED..MANUALLY ENTER 3A018400
* DESIRED PATTERN IN CORE LOCATIONS 001F AND 001F. 3A018410
* AT LEAST ONE BIT MUST BE ON IN SECOND WORD 001F. 3A018420
* 3A018430
***** 3A018440
0000 ORG 0 3A018450
0000 0 6017 PRGO LDX PRDSW-1 *A* XIO PRSPS SPACE PTR 3A018460
0001 0 3005 WAIT 5 WAIT FOR INTERRUPT 3A018470
* 3A018480
0002 0 001A PRRDS DC PRSWS 3A018490
0003 0 00FF DC /00FF *A* DC /3A32 RD SWS 3A018500
0004 0 0018 PRRD DC PREMT 3A018510
0005 0 E8C8 DC /E8C8 *A* DC /3200 RD EMITTER 3A018520
0006 0 7013 DC /7013 3A018530
0007 0 4803 DC /4803 3A018540
0008 0 0020 PRIDL DC /0020 MINIMUM IDLE SCAN CYCLES 3A018550
0009 0 000A DC /000A PRINT INTERRUPT ADDRESS 3A018560
000A 0 0827 PRINT DC /0827 INTERRUPT ENTRY 3A018570
000B 0 080C XIO PRDSW 3A018580
000C 0 4850 BOSC - EMITTER RESPONSE 3A018590
000D 0 7023 MDX PRSPR * NO, TRY SPACE RESPONSE 3A018600
000E 0 C018 LD PRSCN+7 3A018610
000F 0 4820 BSC Z SCAN FIELD ZERO 3A018620
0010 0 701B MDX PREND * NO, GO STOP PRINTER 3A018630
0011 0 C039 LD PRDLY 3A018640
0012 0 4808 BSC + LAST IDLE SCAN CYCLE 3A018650
0013 0 7027 MDX PRPRT * YES, GO PRINT 3A018660
0014 0 9034 S PR DECRF IDLE COUNT BY ONE 3A018670
0015 0 D035 STO PRDLY 3A018680
0016 0 7023 MDX PRWT3 3A018690
0017 0 C0F2 LD PRINT 3A018700
0018 0 D0E7 PRDSW STO PRGO 3A018710

```

```

0019 0 C8EC LDD PRRD+2 *A* DC /3701 SENSE DSW 3A018720
001A 0 18C4 PRSTR RTE 4 3A018730
001B 0 D0FD STO PRDSW+1 *A* DC /3480 START PTR 3A018740
001C 0 18D0 PRSTP RTE 16 3A018750
001D 0 D0FD STO PRSTR+1 *A* DC /3440 STOP PTR 3A018760
001E 0 F02B PRFLD EOR PRDLY-1 *A* DC /FFFF 3A018770
001F 0 D0FD STO PRSTP+1 *A* DC /FFFF 3A018780
0020 0 C8F2 PRSCN LDD PRRDS+1 3A018790
0021 0 18C8 RTE 8 3A018800
0022 0 88E0 AD PRRDS+1 3A018810
0023 0 D8FA STO PRFLD 3A018820
0024 0 C0F0 LD PRRD+1 3A018830
0025 0 1902 SRA 2 3A018840
0026 0 D0DC STO PRRDS+1 3A018850
0027 0 1008 SLA 8 3A018860
0028 0 D0DC PRSPS STO PRRD+1 3A018870
0029 0 C01C LD PR-3 *A* DC /3401 SPACE PTR 3A018880
002A 0 1802 SRA 2 3A018890
002B 0 D0FD STO PRSPS+1 3A018900
002C 0 08EF PREND XIO PRSTP STOP PRINTER 3A018910
002D 0 C0FC LD PRSWS 3A018920
002E 0 4804 BSC E BIT SW 15 ON 3A018930
002F 0 3002 WAIT 2 * YES, WAIT 3A018940
0030 0 70CF MDX PRGO 3A018950
001A 0 PRSWS EQU PRSTR 3A018960
0018 0 PREMT EQU PRDSW 3A018970
0031 0 1002 PRSPR SLA 2 3A018980
0032 0 4850 BOSC - SPACE RESPONSE 3A018990
0033 0 70D7 MDX PRINT+1 * NO, CHECK DSW AGAIN 3A019000
0034 0 10E0 SLC 32 3A019010
0035 0 D8EA STO PRSCN CLEAR 3A019020
0036 0 D8FB STO PRSCN+2 OR SET 3A019030
0037 0 D8EC STO PRSCN+4 SCAN 3A019040
0038 0 D8ED STO PRSCN+6 FIELD 3A019050
0039 0 08E0 XIO PRSTR START PRINTER 3A019060
003A 0 3003 PRWT3 WAIT 3 WAIT FOR INTERRUPT 3A019070
003B 0 08C6 PRPRT XIO PRRDS READ BIT SWITCHES 3A019080
003C 0 08C7 XIO PRRD READ EMITTER 3A019090
003D 0 C0DC LD PRSWS GET SWS 3A019100
003E 0 F8C9 OR PRIDL OR MINIMUM IDLES 3A019110
003F 0 18C8 RTE 8 3A019120
0040 0 1008 SLA 8 ISOLATE CHARACTER 3A019130
0041 0 4320 BSC Z SKIP IF NO CHAR ENTERED 3A019140
0042 0 F005 FOR PREMT COMPARE WITH EMITTER 3A019150
0043 0 4320 BSC Z SKIP IF SAME CHAR 3A019160
0044 0 70F5 MDX PRWT3 3A019170
0045 0 10C8 SLC 8 3A019180
0046 0 D004 STO PRDLY SET IDLE COUNT 3A019190
0047 0 C9D6 LDD PRFLD 3A019200
0048 0 70EC MDX PRSPR+4 3A019210
0049 0 0001 PR DC /0001 3A019220
004A 0 00C0 DC /00C0 3A019230
***** 3A019240
004B 0 0040 PRDLY DC /0040 THE LAST FIVE WORDS ARE 3A019250
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A019260
004D 0 2000 DC /2000 * IDENTIFICATION. THREE 3A019270
004E 0 1000 DC /1000 * FOR THE PID AND TWO FOR 3A019280
004F 0 0040 DC /0040 * SEQUENCE. 3A019290
0050 0000 END 0 3A019300

```

NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

CPALT 0000 003E 0042
 CPBGN 0000 001C
 CPBLD 0012 0000
 CPBSW 0002 0018 001A 001D 0021
 CPCTL 0009 000E 0018 003C 003F
 CPDSV 0008 0022 0024 0028 002E 002F 0032
 CPDSW 0006 0002 0004 0015 0017 001E 0023 002D 0039 003B
 CPIN4 002C 000C 0031
 CPLOP 0036 0038
 CPONE 0001 0036
 CPRDS 001D 0009
 CPRET 0032 002B
 CPSEN 0022 000F 0011 0027 0043
 CPSET 0008 001F 0033 0040
 CPWRT 0004 0012 0014 0029
 CRARA 0036 0006 0014 0045
 CRBGN 0000 0039
 CRBLD 0035 0000 0019 0028 0032
 CRBSW 0002 002D 0030 0035 0037
 CRDSV 0009 0010
 CRDSW 0004 0002 000F 0016 0031 0038 003A 003F
 CREND 000A 0022 0047
 CRERR 0008 0015 001D 0027
 CRIN4 000E 000C 0013
 CRLD 0014 001F 0021 0024 0026
 CRLDP 002A 001C 002C
 CRMDD 001F 0018
 CRONE 0001 0020 002A 003C 003E
 CRRDR 0006 002E 0040 0042
 CRRST 0030 0004 0048
 CRSRA 000B 0025 0046
 CRSTR 002D 0034
 CROR0 000D 0043
 DCBGN 0000
 DCBLD 0020 0000
 DCBSW 0008 0019 0022 0023 003C 0040
 DCDSW 004C 000C 0011 0028 0045 0048
 DCEND 0048 001B 0036
 DCINT 000B 000A 0010
 DCON1 0004 0026 002A 002E
 DCON2 0006 0031
 DCON3 000D 0039
 DCON5 0002 0020
 DCRD 004E 002C 0049
 DCSWS 0001 0008 0015 0024 003D
 DCWR 0050 0030 0034 0042 0046
 DCXR3 0003 0018 001A 0035 003F 0041
 DC1 003C 001F
 DC3 003E 003A 0044
 DC5 0014 001D 0038
 DC6 0048 0013
 DKBD1 000F 0026
 DKBD2 0010 002A
 DKBGN 0000 001C
 DKBIT 000E 0002 001B 0021 0025 0028 002C 0031 0042
 DKBLD 001B 0000
 DKBSW 0002 001D 001F 0020 0030
 DKCON 0042 001A
 DKDSV 0008 0013 0035 0036 003D
 DKDSW 0008 0012 0022 0029 0034 0045
 DKENT 0001 0017 0037 003F
 DKHME 0004 002D 0038
 DKIN2 0011 000A 0016
 DKMDV 003A 0019 0048
 DKRST 0020 000E
 DKSEK 0006 002E 0033 003A 003C 0040 0044
 DKOFF 000D 0043
 DK004 000C 003B

FPBLD 0033 0000
 FPBSW 0006 000D 0013 0019 003F 0041
 FPCAR 0004 0008 0011 002F 0036 0038
 FPDSW 0002 0015 0018 001F 0038 003D
 FPINT 001E 000C 0021
 FPOUT 0032 000A 0014
 FPPRT 000A 001C 0035 003A 003E 0044
 FPRES 0047 0033
 FPSKP 0008 002D 0039
 FPSTR 000D 0047
 FPSWS 0001 0006 000E 000F 0016 0027
 FPOO1 0031 0045
 FP1 0013 0026
 FP2 0017 001B 0042 0046
 FP8 002F 002C 002E
 KYBGN 0000 0031
 KYBLD 0024 0000
 KYBSW 0002 0012 0024 0026 0036
 KYDCH 000D 0021
 KYDSP 0022 0010
 KYDSV 000B 0014
 KYDSW 0004 0002 0013 001E 0027 0029 0030 0037
 KYIN4 0011 000C 003A 003D
 KYKEY 000A 0008 000D 000F 0022 0035 003B
 KYONE 0001
 KYRD 0008 001C 002D 002F
 KYRDW 001C 0018
 KYREQ 0019 0017
 KYRST 0032 0004
 KYSEL 0006 001D 002A 002C 0033
 KYSET 0036 001B 0023
 PHBLD 0037 0000
 PHBSW 0004 0016 0018 0027 003E 0040
 PHCTR 0002 0017 0019 0026
 PHDSW 000A 0012 001E 0041 0043
 PHFED 0000 0030 003C 003D
 PHINT 0011 0008 000C 0024
 PHK50 000E 001A
 PHPCH 0006 0020 0044 0046
 PHPST 0008 0031 0039 003B
 PHRES 004A 0037
 PHSTK 000C 0033 0047 0049
 PHSWS 0003 0006 001D 001F 0028 0034
 PH1 000F 004A
 PH2 0030 0010 0036
 PH4 0020 001C
 PH6 0022 0015
 PH8 0033 002D
 PLALT 0048 0045
 PLBGN 0000 001D
 PLBLD 0012 0000
 PLBSW 0002 0019 001B 001E 0022
 PLCTL 0013 0043 0046 0049
 PLDSV 0009 000E 002C 002E 0032 0035
 PLDSW 0006 0002 0004 000D 0015 0018 001F 0023 0027 002D 003B 0042
 PLIN3 000C 000B 0010
 PLLDP 0038 003A
 PLONE 0001 0017 0038
 PLOT 0004 0012 0014 0033
 PLRDS 001E 0008
 PLRET 0035 0011
 PLRST 0008 001C
 PLSEN 002C 0031 004A
 PLSET 000A 0020 0036
 PLSTR 0022 0026 002B 0040 0047
 PR 0049 0014 0029
 PRDLY 004B 0011 0015 001E 0046
 PRDSW 001B 0000 000B 001B

```

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

```

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

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1. PURPOSE

THE PURPOSE OF DIMAL IS TO GENERATE A MAINTENANCE LIBRARY OF 1130 DIAGNOSTIC FUNCTION TESTS, AND THEN TO PROVIDE A METHOD FOR BRINGING THESE DIAGNOSTIC TESTS INTO CORE FOR PROGRAM EXECUTION.

2. REQUIREMENTS

2.1 PROGRAM REQUIREMENTS

A. DIMAL CAN BE LOADED ON DISK USING ANY ONE OF THE FOLLOWING IPL DEVICES-
1442 CARD READER, 2501 CARD READER, OR 1134 PAPER TAPE READER.
THESE DEVICES SHALL BE REFERED TO, COLLECTIVELY, AS INPUT DEVICES THROUGHOUT THIS DOCUMENTATION.

B. DIMAL IS CALLED FROM THE DISK PACK BY ONE OF THREE WAYS

1. CALL CARD (SEE SECTION 3.3.1.).
2. CALL TAPE (SEE SECTION 3.3.1).
3. CONSOLE ENTRY SWITCHES (SEE APPENDIX SECTION 6.1).

2.2 EQUIPMENT REQUIREMENTS

- A. 1131 CPU.
- B. 4K CORE STORAGE.
- C. ANY OF THE FOLLOWING INPUT DEVICES-
1442 CARD READER, 2501 CARD READER, OR 1134 PAPER TAPE READER.
- D. CONSOLE PRINTER.
- E. DISK DRIVE.
- F. 2315 C.E. DISK PACK. TRACKS 90-110 ARE NOT USED.

3. USE PROCEDURE

I 3.1 INITIAL DIMAL DISK PACK GENERATION I

THE FOLLOWING PROCEDURE SHOULD BE FOLLOWED TO LOAD DIMAL AND THE DIAGNOSTIC FUNCTION TESTS ON THE C.E. DISK PACK.

1. LOAD AND EXECUTE PROGRAM PID 0308 (2315 DISK INITIALIZATION PROGRAM) TO ENSURE THAT THE DISK SECTORS ARE PROPERLY ADDRESSED, AND THAT ANY BAD CYLINDERS ARE DEFINED.

REFER TO DIAGNOSTIC MONITOR AND 2315 PROGRAM DOCUMENTATION FOR OPERATING PROCEDURES.

2. LOAD AND EXECUTE PROGRAM PID 0309 (2310 DISK FUNCTION TEST) TO INSURE THAT THE DISK DRIVE IS OPERATING CORRECTLY. REFER TO DIAGNOSTIC MONITOR AND 2310 PROGRAM DOCUMENTATION FOR OPERATING PROCEDURES.

3. AT THE INPUT DEVICE-

A. CARD READER-1442 OR 2501.
PLACE PROGRAM DECK 0302 (DIMAL SYSTEM) IN THE HOPPER BEHIND THE 1442 OR 2501 RELOCATING LOADER DEPENDING ON THE INPUT DEVICE. MAKE THE CARD READER READY.

B. PAPER TAPE-1134-
READ THE PAPER TAPE RELOCATING LOADER (PID 03AC) INTO CORE.

PLACE THE DIMAL TAPE (PID 0302) IN THE 1134 P.T. READER.
SET CONSOLE ENTRY SWITCHES TO /0078, SET MODE SWITCH
TO LOAD, AND PRESS LOAD IAR BUTTON. SET MODE SWITCH
TO RUN. PRESS THE 1131 CPU START BUTTON.

4. OBTAIN THE PROGRAM DECKS OR TAPES FOR THE DIAGNOSTIC FUNCTION TESTS TO BE LOADED ON THE DISK.
 - A. THE FOLLOWING PROGRAMS CAN BE LOADED ON THE DISK-
 1. 1130 DIAGNOSTIC PROGRAMS.
 2. RPO PROGRAMS.
 3. 2250 DISPLAY PROGRAMS.
 4. LATEST LEVEL OF THE 1130 DIAGNOSTIC MONITOR II.

*** VERY IMPORTANT NOTE***

IN GENERAL, ANY PROGRAM TO BE LOADED ON DISK MUST OBSERVE THE FOLLOWING RULES TO BE DIMAL COMPATIBLE -

1. PROGRAM ID IS THE FIRST WORD IN THE PROGRAM.
 2. PROGRAMS WITH PIDS LESS THAN 9F - MONITOR CONTROLLED PROGRAMS- SHOULD NOT HAVE MORE THAN 256 CARDS PER DECK.
 3. IF A NON-MONITOR PROGRAM ORGS AT MORE THAN ONE PLACE, THEN EACH ORG ADDRESS MUST BE NUMERICALLY GREATER THAN THE PREVIOUS ORG ADDRESS.
- B. THE FOLLOWING PROGRAMS SHOULD NOT BE LOADED ON THE DISK.
 1. PID 03A3 BASIC DIAGNOSTIC LOADER.
 2. PID 03A5 ONE-CARD DIAGNOSTIC PROGRAMS.
 3. PID 03AD BASIC DIAGNOSTIC LOADER-2501.
 4. PID 03A6 CORE STORAGE ADJUSTMENT TEST.
 5. PIDS 03AA, 03AB, 03AC RELOCATABLE LOADERS FOR THE 1442, 2501, AND PAPER TAPES, RESPECTIVELY.
 6. SCA INTEGRITY TEST.
 7. ONE CARD SCOPE LOOPS PID 03A0.
 8. PID 030A DISK ADJUST.
5. PLACE THE DFT PROGRAMS IN THE READER BEHIND DIMAL. PATCHED DECKS CAN BE LOADED PROVIDED THAT PATCH CARDS ARE INSERTED JUST BEFORE THE LAST CARD OF EACH DECK. HEX PATCH CARDS MAY BE ENTERED SEPARATELY TO PATCH EXISTING PROGRAMS ALREADY ON DISK. REFER TO SECTION 3.2.4 FOR DETAILS.

*** IMPORTANT NOTE ***

THE FOLLOWING PROGRAMS CAN NOT BE PATCHED -

1. 1130 DIAGNOSTIC MONITOR II.
2. PROGRAMS WITH PIDS GREATER THAN 9F.
3. PROGRAMS PUNCHED IN 8-8 FORMAT.

6. THE DFT PROGRAM DECKS MAY BE LOADED IN ANY ORDER. DO NOT PLACE BLANK CARDS AT THE END OF THE PROGRAMS.
7. AT THE 1131 CPU, PRESS THE RESET AND PROGRAM LOAD BUTTONS. DIMAL SHOULD START READING IN.
8. MESSAGE C015 IS PRINTED REQUESTING THE AREA CODE FOR THE DISK DRIVE. ENTER THE AREA CODE IN CONSOLE SWITCHES AND PRESS START.

I	DISK DRIVE	I	AREA CODE	I
I		I		I
I	CPU	I	/2000	I
I		I		I
I	1	I	/8800	I
I		I		I
I	2	I	/9000	I
I		I		I
I	3	I	/9800	I
I		I		I
I	4	I	/AC00	I
I		I		I

9. MESSAGE C014 IS PRINTED REQUESTING CE CYLINDER NUMBER. ENTER IN CONSOLE SWITCHES /00C7 UNLESS OTHERWISE INDICATED DURING THE RUNNING OF THE DISK INITIALIZATION TEST (PID 0308). PRESS START.

NOTE - IF THE INTERRUPT REQUEST KEY WAS ACCIDENTLY PRESSED, THE INITIAL LOADER MUST BE RESTARTED. THIS CAN BE ACCOMPLISHED BY PRESSING STOP, RESET, AND START BUTTONS ON THE 1131 CPU.

10. MESSAGE C006 IS PRINTED ASKING THE C.E FOR THE NUMBER OF THE INPUT DEVICE. ENTER IN THE CONSOLE SWITCHES ONE OF THE FOLLOWING NUMBERS-DEPENDING ON THE INPUT DEVICE BEING USED- /1442, /2501, /1134. PRESS START.
11. COMMUNICATION OF ERRORS AND OPERATOR ACTIONS IS VIA PRINTOUTS AND PROGRAM WAITS. REFER TO SECTION 4.0 PRINTOUTS, AND SECTION 3.4 PROGRAM WAITS TO DETERMINE WHAT ACTION MUST BE TAKEN FOLLOWING A PRINTOUT OR PROGRAM WAIT.
12. DFT'S WILL START LOADING UNTIL THE INPUT DEVICE GOES NOT READY. MESSAGE C007 IS PRINTED ASKING THE CE TO READY THE INPUT DEVICE.

NOTE - INCASE OF CARD READER ERROR CHECKS -SUCH AS READ REG- NPRO THE CARD(S), PLACE IN FRONT OF REMAINING DECK IN THE HOPPER, AND MAKE IT READY. AT THE 1131 CPU. PRESS START.

13. AT THE CARD READER PRESS THE START BUTTON. THE READER SHOULD GO READY FOR THE LAST CARD. FOR PAPER TAPE, PLACE A STRIP OF BLANK TAPE OVER THE READ STATION.
14. AT THE 1131 CPU PRESS START IF THE INPUT DEVICE IS A 2501 CARD READER. THE LAST CARD SHOULD READ IN. THIS STEP IS NOT REQUIRED FOR A 1442 CARD READER OR 1134 PAPER TAPE READER.
15. DIMAL PRINTS MESSAGE C001.

IF IT IS DESIRED TO LOAD MORE DFT'S READY THE INPUT DEVICE WITH DFT PROGRAMS AND PRESS START. DFT LOADING WILL CONTINUE AS BEFORE.
16. IF DFT LOADING IS COMPLETED, SET CONSOLE ENTRY SWITCHES TO /FF00 AND PRESS START.

I WARNING I

FAILURE TO SET THE SWITCHES PROPERLY TO /FF00 WILL NOT COMPLETE THE GENERATION OF THE DIMAL PACK. RELOADING DIMAL IS NECESSARY.

17. DIMAL WILL COMPLETE THE GENERATION FUNCTION AND PRINT MESSAGE D001 (LOCATION DIRECTORY). PRESS START FOR A LISTING OF THE PROGRAMS AND THEIR LOCATIONS ON DISK.

I NOTE TO CE I

THE LOCATION DIRECTORY LISTS THE PROGRAM ID, THE ADDRESS OF THE STARTING CYLINDER, THE TOTAL NUMBER OF SECTORS OCCUPIED BY THE PROGRAM, AND THE STARTING SECTOR. HOWEVER, FOR A QUICK REFERENCE TO THE PROGRAMS ON DISK, DIMAL OFFERS AN OPTION THAT LISTS ALL THE PIDS WITHOUT THE OTHER INFORMATION. IF SUCH AN OPTION IS DESIRED AT THIS POINT PRESS STOP, RESET, AND START ON THE 1131 CPU. MESSAGE C004 (SELECT OPTIONS) WILL BE PRINTED. REFER TO SECTION 3.2.11 FOR OPERATING PROCEDURES.

OPTION 6 AND OPTION 5 OR 8 MUST BE PERFORMED AFTER THE PID TABLE HAS BEEN PRINTED.

18. MESSAGE D003 IS THEN PRINTED. THIS MESSAGE INDICATES A SEEK COUNT WHICH IS REQUIRED BY THE BIT SWITCH ENTERED CALL ROUTINE. IT IS SUGGESTED THAT THIS PRINTOUT BE TAPED TO THE C.E. DISK PACK TO AVOID LOSS.
19. MESSAGE C004 IS PRINTED ASKING THE CE TO SELECT OPTIONS. A CALL CARD OR TAPE MUST BE PUNCHED AT THIS TIME. REFER TO SECTION 3.2.7 TO PUNCH A CALL CARD OR 3.2.10 TO PUNCH A CALL TAPE.

***** IMPORTANT NOTE *****
*
* RUNNING OF THE 2315 DISK INITIALIZATION PROGRAM ON THE *
* MAINTENANCE LIBRARY PACK WILL CAUSE THE LIBRARY TO BE *
* DESTROYED. *

I 3.2 EXISTING DIMAL DISK PACK MODIFICATION (LOADER/ORGANIZER SECTION) I

1. GENERAL OPERATING INSTRUCTIONS

- A. PLACE THE C.E. DISK PACK CONTAINING THE MAINTENANCE LIBRARY ON THE DESIRED DISK DRIVE AND MAKE THE DRIVE READY.
- B. OBTAIN THE CALL CARD OR PAPER TAPE PROVIDED BY DIMAL DURING INITIAL DISK LIBRARY GENERATION.

IF IT IS DESIRED TO CALL DIMAL VIA DATA ENTRY SWITCH CALL ROUTINE, REFER TO APPENDIX SECTION 6.1.
- C. SET CONSOLE ENTRY SWITCHES TO /XX01 (WHERE XX IS THE DISK AREA CODE) TO CALL THE LOADER/ORGANIZER INTO CORE.

DISK DRIVE	AREA CODE
CPU	/2001
1	/8801
2	/9001
3	/9801
4	/A001

WARNING- FAILURE TO SET 1 IN SWITCH 15 COULD DESTROY THE DIRECTORY TABLE DURING 'ADD A PROGRAM' OPTION. IT IS RECOMMENDED THAT DIMAL BE RECALLED WITH THE PROPER SETTING OF SWITCHES-REFER TO STEP B ABOVE.

- D. IPL THE CALL CARD OR TAPE.
- E. MESSAGE C006 IS PRINTED ASKING THE C.E FOR THE NUMBER OF THE INPUT DEVICE. ENTER IN THE CONSOLE SWITCHES ONE OF THE FOLLOWING NUMBERS-DEPENDING ON THE INPUT DEVICE BEING USED- /1442, /2501, /1134. PRESS START.
- F. THE CALL CARD OR TAPE WILL FIRST LOAD THE DIMAL HEADER TESTS. IF THE HEADER TESTS RUN SUCCESSFULLY (RUN TIME APPROXIMATELY 1 SEC), THE COLD START LOADER WILL BE BROUGHT INTO CORE AND IN TURN WILL LOAD THE DIMAL LOADER/ORGANIZER SECTION.

IF AN ERROR WAIT OCCURS, REFER TO SECTION 6.2 FOR ERROR PROCEDURE.
- G. THE LOADER/ORGANIZER THEN PRINTS MESSAGE C004.

TABLE 1 SUMMARIZES THE OPTIONS AVAILABLE WITH THE LOADER/ ORGANIZER SECTION.

OPERATING PROCEDURES FOR THE OPTIONS FOLLOW TABLE 1.

TABLE 1
LOADER/ORGANIZER OPTION SWITCHES

0 1 2 3 4 5 6 7 8 9	DESCRIPTION
1	LIST ALL PIDS ON DISK.
1	PUNCH CALL PAPER TAPE
1	DELETE HEX PATCHES FOR A GIVEN PID.
1	LIST THE CALL SEEK COUNT REQUIRED BY THE CONSOLE ENTRY SWITCH CALL ROUTINES.
1	PUNCH CALL CARDS.
1	LIST CONTENTS OF PATCH TABLE.
1	LIST CONTENTS OF LOCATION DIRECTORY.
1	ENTER HEX PATCHES SEPARATELY.
1	DELETE PROGRAM.
1	ADD PROGRAM.

* ONLY 1 OPTION AT A TIME MAY BE PERFORMED. OPTION PRIORITY IS FROM SWITCH 0 TO SWITCH 9.

2. ADD PROGRAM TO DIMAL PACK (SWITCH 0)

- A. READY THE INPUT DEVICE WITH THE PROGRAM OR PROGRAMS TO BE ADDED. INSURE THAT THE PATCH CARDS IF ANY ARE INSERTED JUST BEFORE THE LAST CARD OF EACH DECK. DO NOT SEPARATE DECKS WITH BLANK CARDS.
- B. AT THE CPU SET CONSOLE ENTRY SWITCH 0, CLEAR ALL OTHERS, AND PRESS START BUTTON. PROGRAMS SHOULD READ UNTIL THE READER BECOMES EMPTY OR THE END OF TAPE IS REACHED.

NOTE-INCASE OF CARD READER ERROR CHECKS -SUCH AS READ REG-NPROD THE CARD(S), PLACE IN FRONT OF REMAINING DECK IN THE HOPPER, AND MAKE IT READY. AT THE 1131 CPU, PRESS START.

- C. PRESS THE READER START BUTTON TO READY IT FOR THE LAST CARD. THIS STEP IS INAPPLICABLE TO PAPER TAPE.
- D. PRESS THE 1131 CPU START BUTTON IF THE INPUT DEVICE IS A 2501 CARD READER. LAST CARD SHOULD READ IN. THIS STEP IS NOT REQUIRED IF THE INPUT DEVICE IS A 1442 CARD READER OR AN 1134 PAPER TAPE READER.
- E. MESSAGE C001 IS THEN PRINTED, SET CONSOLE ENTRY SWITCHES TO /FF00 AND PRESS START.
- F. A NEW LISTING OF THE DISK LOCATION DIRECTORY WILL BE PROVIDED BY PRESSING START.

NOTE-IF A DIRECTORY TABLE IS NOT DESIRED AT THIS TIME, PRESS THE 1131 STOP, RESET, AND START. THIS WILL ALLOW MESSAGE C004 TO BE PRINTED INFORMING THE CE TO SELECT OPTIONS. IF A LISTING OF ALL THE PIDS ON DISK IS DESIRED REFER TO SECTION 3.2.11 FOR OPERATING PROCEDURES.

- G. MESSAGE C004 IS THEN PRINTED INFORMING THE C.E. TO SELECT OPTIONS.

3. DELETE PROGRAM FROM DIMAL PACK (SWITCH 1)

- A. SET CONSOLE ENTRY SWITCH 1, CLEAR ALL OTHERS, AND PRESS START.
- B. DIMAL PRINTS MESSAGE C002 INFORMING THE C.E. TO ENTER THE PID OF THE PROGRAM TO BE DELETED VIA CONSOLE ENTRY SWITCHES.
- C. ENTER THE PID OF THE PROGRAM TO DELETE IN CONSOLE ENTRY SWITCHES 8 THROUGH 15 AND PRESS START.
- D. DIMAL WILL DELETE THE PROGRAM SPECIFIED AND PRINT A NEW LOCATION DIRECTORY. IF A PROGRAM HAS BEEN LOADED ON THE DISK MORE THAN ONCE, THEN THE ABOVE PROCEDURE MUST BE REPEATED TO DELETE THAT PID AGAIN. IF THE PROGRAM WAS NOT ON DISK, MESSAGE C004 IS PRINTED (SELECT OPTIONS).

NOTE-IF A DIRECTORY TABLE IS NOT DESIRED AT THIS TIME, PRESS THE 1131 STOP, RESET, AND START. THIS WILL ALLOW MESSAGE C004 TO BE PRINTED ASKING THE CE TO SELECT OPTIONS.

- E. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.

4. ENTER HEX PATCH CARDS SEPARATELY. (CARD PROGRAMS ONLY)(SWITCH 2)

- A. SET CONSOLE ENTRY SWITCH 2, CLEAR ALL OTHERS
- B. OBTAIN A COMPLETE SET OF PATCH CARDS FOR THE PROGRAM TO WHICH THE CHANGE IS TO BE MADE.

LIMIT YOUR PATCHES TO A MAXIMUM OF 14 HEX WORDS PER CARD. (LEAVE COLUMNS 77-80 OF THE PATCH CARD BLANK)
- C. PLACE THE PATCH CARDS IN THE HOPPER AND MAKE IT READY.
- D. AT THE 1131 CPU PRESS START.
- E. DIMAL MESSAGE C008 IS PRINTED INFORMING THE C.E. TO ENTER THE PID OF THE PROGRAM TO BE PATCHED VIA CONSOLE ENTRY SWITCHES. ENTER THE PID IN SWITCHES 8 THRU 15. PRESS START.
- F. PATCH CARDS WILL READ IN UNTIL THE CARD READER BECOMES EMPTY.
- G. DEPRESS THE READER START BUTTON TO READY IT FOR THE LAST CARD.
- H. DEPRESS THE 1131 CPU START BUTTON IF THE INPUT DEVICE IS A 2501 CARD READER. THE LAST CARD SHOULD READ IN. THIS STEP IS NOT REQUIRED WHEN USING A 1442 CARD READER.
- I. DIMAL MESSAGE D002 IS PRINTED. PRESS START FOR A LISTING OF THE PATCH TABLE.
- J. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.

*** VERY IMPORTANT NOTE***

IF A PROGRAM THAT HAS BEEN LOADED ON DISK REQUIRES PATCHING, THEN ANY NEW PATCH CARDS MUST ACCOMPANY OLD PATCHES. THIS IS DUE TO THE FACT THAT AS NEW PATCHES FOR A GIVEN PROGRAM ARE LOADED, ALL THE OLD PATCHES FOR THAT PROGRAM ARE DELETED IN FAVOR OF THE NEW ONES. REFER TO SECTION 3.2.6 FOR A LISTING OF THE PATCH TABLE.

5. LIST CONTENTS OF DIMAL LOCATION DIRECTORY (SWITCH 3)
 - A. SET CONSOLE ENTRY SWITCH 3, CLEAR ALL OTHERS, AND PRESS START.
 - B. DIMAL WILL LIST THE LOCATION DIRECTORY, MESSAGE D001.
 - C. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.
6. LIST CONTENTS OF DIMAL PATCH TABLE (SWITCH 4)
 - A. SET CONSOLE ENTRY SWITCH 4, CLEAR ALL OTHERS, AND PRESS START.
 - B. MESSAGE D002 IS PRINTED, PATCH CARD TABLE. PRESS START FOR A LISTING OF THE PATCH TABLE. THE TYPEWRITER WILL LINE FEED ONE LINE FOR EVERY EMPTY SECTOR IN THE PATCH CYLINDER.
 - C. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.
7. PUNCH CALL CARDS. (SWITCH 5)
 - A. SET CONSOLE ENTRY SWITCH 5, CLEAR ALL OTHERS, AND PRESS START.
 - B. MESSAGE C005 WILL BE PRINTED. LOAD 1442 WITH BLANK CARDS.
 - C. AT THE 1131 CPU, PRESS START. DIMAL SHOULD START PUNCHING THE CALL CARD.
 - D. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.
 - E. REMOVE AND SAVE THE PUNCHED CALL CARD.
8. LIST CALL SEEK COUNT (SWITCH 6)
 - A. SET CONSOLE ENTRY SWITCH 6, CLEAR ALL OTHERS, AND PRESS START.
 - B. MESSAGE D003 WILL BE PRINTED. SAVE THE MESSAGE FOR FUTURE USE.
 - C. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.
9. DELETE PATCH CARDS. (SWITCH 7)
 - A. SET CONSOLE ENTRY SWITCH 7, CLEAR ALL OTHERS AND PRESS START.
 - B. MESSAGE C002 WILL BE PRINTED INFORMING THE C.E. TO ENTER THE PID OF THE PROGRAM WHOSE PATCHES ARE TO BE DELETED VIA CONSOLE ENTRY SWITCHES.
 - C. ENTER THE PID IN SWITCHES 8 THROUGH 15. PRESS START.

- E. THE PROGRAM WILL PRINT MESSAGE C004 INFORMING THE CE TO SELECT OPTIONS.

NOTE- NO NEW LISTING OF THE PATCH TABLE WILL BE GIVEN. REFER TO SELECT OPTION SWITCH 4 FOR A LISTING OF THE PATCH TABLE.
10. PUNCH CALL PAPER TAPE. (SWITCH 8)
 - A. SET CONSOLE ENTRY SWITCH 8, CLEAR ALL OTHERS.
 - B. READY THE 1055 PAPER TAPE PUNCH WITH BLANK TAPE.
 - C. PUNCH A TWO INCH LEADER DELETE FIELD. DO NOT PRESS FEED BUTTON.
 - D. AT THE 1131 CPU, PRESS START. DIMAL WILL PUNCH THE CALL TAPE.
 - E. MESSAGE C004 IS PRINTED INFORMING THE C.E TO SELECT OPTIONS.
 - F. REMOVE AND SAVE TAPE.
11. LIST ALL PIDS ON DISK. (SWITCH 9)
 - A. SET CONSOLE ENTRY SWITCH 9, CLEAR ALL OTHERS. PRESS START.
 - B. MESSAGE D004 -PID TABLE- WILL BE PRINTED. PRESS START FOR A LISTING.
 - C. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE CE TO SELECT OPTIONS.

I 3.3 DIAGNOSTIC PROGRAM SELECTION AND EXECUTION (SELECT/EXECUTE SECTION) I

1. GENERAL OPERATING INSTRUCTIONS

- A. PLACE THE C.E. DISK PACK CONTAINING THE MAINTENANCE LIBRARY ON THE DESIRED DISK DRIVE AND MAKE THE DRIVE READY.
- B. OBTAIN THE CALL CARD OR PAPER TAPE PROVIDED BY DIMAL DURING INITIAL DISK LIBRARY GENERATION. IF ENTRY SWITCH CALL IS DESIRED, REFER TO APPENDIX 6.1.
- C. MAKE THE INPUT DEVICE READY WITH THE CALL CARD OR TAPE.
- D. SET CONSOLE ENTRY SWITCHES TO /XX02 (WHERE XX IS THE DISK DRIVE AREA CODE) TO CALL IN THE SELECT/EXECUTE SECTION.

I	DISK DRIVE	I	AREA CODE	I
I		I		I
I	CPU	I	/2002	I
I		I		I
I	1	I	/8802	I
I		I		I
I	2	I	/9002	I
I		I		I
I	3	I	/9802	I
I		I		I
I	4	I	/A002	I

- E. IPL THE CALL CARD OR PAPER TAPE.
- F. THE CALL WILL FIRST LOAD THE DIMAL HEADER TESTS. IF THE HEADER TESTS RUN SUCCESSFULLY (RUN TIME APPROXIMATELY 1 SEC) THE COLD START LOADER WILL BE BROUGHT INTO CORE AND IT IN TURN WILL LOAD THE DIMAL SELECT/EXECUTE SECTION.
- IF AN ERROR WAIT OCCURS, REFER TO SECTION 6.2 FOR ERROR PROCEDURE.
- G. SUCCESSFUL LOADING OF THE SELECT/EXECUTE SECTION IS INDICATED BY MESSAGE C009.
- REFER TO SECTIONS 3.3.2 DIAGNOSTIC MONITOR II PROGRAMS SELECTION OR 3.3.3 NON MONITOR PROGRAMS SELECTION FOR THE REMAINDER OF THE OPERATING PROCEDURES.

I NOTE TO C.E. I

DEFINITIONS

RANDOM—PIDS ARE EXECUTED IN THE ORDER SELECTED.

WARNING
2250 DISPLAY PROGRAMS SHOULD
NOT BE SELECTED TO RUN UNDER
RANDOM MODE CONTROL.

SEQUENTIAL—PIDS ARE EXECUTED FROM THE LOWEST
SELECTED PID THROUGH THE HIGHEST
SELECTED PID.

2. DIAGNOSTIC MONITOR II PROGRAMS SELECTIONS.

THERE ARE TWO CATEGORIES OF PROGRAM SELECTIONS -

- I. RANDOM - OVERLAP & NON-OVERLAP.
II. SEQUENTIAL - OVERLAP & NON OVERLAP.

REFER TO THE CATEGORY OF INTEREST FOR OPERATING INSTRUCTIONS.

I I. RANDOM - OVERLAP & NON-OVERLAP. I

- A. MESSAGE C009 (SELECT PID 00XX) IS PRINTED UPON SUCCESSFUL LOADING OF THE SELECT/EXECUTE SECTION.
- IF IT IS DESIRED TO RUN ONE PROGRAM PROCEED TO NEXT STEP, ELSE SKIP TO STEP D.
- B. SET /FFXX (WHERE XX IS THE PID OF THE PROGRAM) IN CONSOLE ENTRY SWITCHES 8 THROUGH 15 AND PRESS START. THE PURPOSE OF INCLUDING FF WITH THE PID IS TO INFORM MONITOR THAT THIS IS THE ONLY PROGRAM SELECTED.
- *** VERY IMPORTANT NOTE ***
- IF SWITCH 15 IS LEFT ON DUE TO ANY DIMAL SWITCH SETTING THE DIAGNOSTIC MONITOR WILL HALT ALL PROGRAM EXECUTION. TO RESTART ALL PROGRAMS, SET CONSOLE ENTRY SWITCHES TO /0080 AND PRESS INTERRUPT REQUEST KEY.
- C. UPON COMPLETION OF THE SELECTED PROGRAM RUN, THE DIAGNOSTIC MONITOR WILL RETURN TO DIMAL. DIMAL IN TURN PRINTS MESSAGE C009. THE NEXT PROGRAM MAY BE SELECTED. SEE STEP A ABOVE.
- D. IF IT IS DESIRED TO RUN SEVERAL PROGRAMS, THEN ENTER /00XX - XX IS THE PID - IN CONSOLE SWITCHES 8 THROUGH 15 AND PRESS THE START BUTTON.
- E. MESSAGE C010 WILL BE PRINTED ASKING THE CE TO SET SW 0 ON FOR SEQUENTIAL PIDS. THIS IS RANDOM MODE, THEREFORE, SET SW 0 OFF AND PRESS START.
- F. THE DIAGNOSTIC MONITOR WILL LOG THE PROGRAM AND RETURN TO DIMAL. DIMAL IN TURN WILL PRINT MESSAGE C009 ASKING FOR THE NEXT PID.
- G. ENTER THE NEXT PID AS EXPLAINED IN STEP D. WHEN ITS TIME TO SELECT THE LAST PROGRAM, ENTER /FFXX IN SMS 0 THROUGH 15, ALSO /00FF ENTERED AS LAST PID TELLS DIMAL THAT ALL PROGRAMS HAVE BEEN LOADED.
- H. THE DIAGNOSTIC MONITOR WILL LOG ALL THE PROGRAMS SELECTED AND WILL AUTOMATICALLY RUN THEM IN OVERLAP MODE IF CORE IS AVAILABLE. REFER TO DIAGNOSTIC MONITOR DOCUMENTATION FOR AVAILABLE OPTIONS.
- I. UPON COMPLETION OF OVERLAP OPERATION, THE DIAGNOSTIC MONITOR WILL NOT RETURN TO DIMAL. TO RETURN TO DIMAL, USE MONITOR SWITCH SETTING /0080.

I II. SEQUENTIAL- OVERLAP & NON OVERLAP. I

- A. MESSAGE C009 -SELECT PID (00XX)- IS PRINTED UPON SUCCESSFUL LOADING OF THE SELECT/EXECUTE SECTION.
- B. SET THE PID OF THE DESIRED PROGRAM IN CONSOLE SWITCHES 8 THROUGH 15. PRESS THE START BUTTON.
- C. MESSAGE C010 WILL BE PRINTED ASKING THE CE TO SET SW 0 ON FOR SEQUENTIAL PROCESSING OF PIDS.
- D. SET SW 0 ON AND PRESS START.
- E. MESSAGE C011 WILL BE PRINTED REQUESTING LAST PID IN SEQUENCE.
- F. ENTER THE LAST PID IN SWITCHES 8 THROUGH 15. PRESS START. (OVERLAP OR NONOVERLAP)
- G. MESSAGE C012 WILL BE PRINTED ASKING FOR MODE OF OPERATION.
- H. SET SW 15 OFF FOR NON OVERLAP AND ON FOR OVERLAP THEN PRESS START

*** VERY IMPORTANT NOTE ***

IF SWITCH 15 IS LEFT ON DUE TO ANY DIMAL SWITCH SETTING THE DIAGNOSTIC MONITOR WILL HALT ALL PROGRAM EXECUTION. TO RESTART ALL PROGRAMS, SET CONSOLE ENTRY SWITCHES TO /0080 AND PRESS INTERRUPT REQUEST KEY.

- I. THE DIAGNOSTIC MONITOR WILL LOG EACH PROGRAM LOADED INTO CORE AND EXECUTE IT. HOWEVER IF SWITCH 15 WAS SET TO ON IN STEP H THEN ALL PROGRAMS WILL BE LOADED INTO CORE BEFORE EXECUTION OF ANY PROGRAM STARTS.

WHENEVER MORE THAN ONE PROGRAM AT A TIME IS IN CORE MONITOR WILL AUTOMATICALLY RUN THEM IN OVERLAP MODE.

REFER TO DIAGNOSTIC MONITOR DOCUMENTATION FOR AVAILABLE OPTIONS AND OPERATING PROCEDURES.

- J. UPON COMPLETION OF NON OVERLAP RUNS DIMAL WILL PRINT MESSAGE C009. THE NEXT PROGRAM MAY NOW BE SELECTED. UPON COMPLETION OF OVERLAP RUNS, DIMAL CONTROL IS LOST. TO REGAIN CONTROL, SET THE I-REG TO /0078 AND PRESS START. MESSAGE C009 WILL PRINT AND THE NEXT PROGRAM(S) MAY NOW BE SELECTED.

I 3. NON MONITOR PROGRAMS SELECTION I

THERE ARE TWO CATEGORIES OF PROGRAM SELECTIONS-

- I. RANDOM.
- II. SEQUENTIAL.

REFER TO THE CATEGORY OF INTEREST FOR OPERATING INSTRUCTIONS.

I I. RANDOM I

- A. MESSAGE C009 SELECT PID (00XX) IS PRINTED UPON SUCCESSFUL LOADING OF THE DIMAL SELECT/EXECUTE SECTION.
- B. SET THE PID OF THE DESIRED PROGRAM IN CONSOLE SWITCHES 8 THROUGH 15 AND PRESS START.
- C. MESSAGE C010 WILL BE PRINTED INFORMING THE C.E. TO SET SWITCH 0 ON FOR SEQUENTIAL PIDS. THIS IS RANDOM MODE, THEREFORE, SET SW 0 OFF AND PRESS START. CONTROL IS NOW TRANSFERED TO THE SELECTED PROGRAM.
- D. UPON COMPLETION OF THE SELECTED TEST, DIMAL WILL PRINT MESSAGE C009 TO SELECT PID. ANOTHER PROGRAM MAY BE SELECTED NOW.

NOTE- IF THE PROGRAM SELECTED IS NOT DIMAL COMPATIBLE--MEANING IT DOES NOT PROVIDE A BRANCH TO LOCATION /0078 IN DIMAL-CONTROL WILL BE LOST AND MESSAGE C009 WILL NOT BE PRINTED. TO REGAIN CONTROL, SET THE I-REG TO /0078 AND PRESS START. IF THIS PROCEDURE FAILS, RECALL DIMAL WITH THE CALL CARD OR PAPER TAPE.

I II. SEQUENTIAL. I

- A. MESSAGE C009 SELECT PID (00XX) IS PRINTED UPON SUCCESSFUL LOADING OF THE DIMAL SELECT/EXECUTE SECTION.
- B. SET THE PID OF THE DESIRED PROGRAM IN CONSOLE SWITCHES 8 THROUGH 15 AND PRESS START.
- C. MESSAGE C010 WILL BE PRINTED INFORMING THE C.E. TO SET SWITCH 0 ON IF SEQUENTIAL PIDS ARE TO BE PROCESSED
- D. SET SW 0 TO THE ON POSITION AND PRESS START.
- E. MESSAGE C011 IS PRINTED REQUESTING THE LAST PID IN SEQUENCE.
- F. ENTER LAST PID OF SEQUENCE IN SWITCHES 8 THROUGH 15. PRESS START.

G. THE PROGRAMS WILL NOW BE EXECUTED ONE AT A TIME PROVIDED THAT EACH PROGRAM RETURNS TO LOCATION /0078 (DIMAL COMPATIBLE) AT THE END OF EXECUTION.

NOTE- IF THE PROGRAM SELECTED IS NOT DIMAL COMPATIBLE--MEANING IT DOES NOT PROVIDE A BRANCH TO LOCATION /0078 IN DIMAL-CONTROL WILL BE LOST AND MESSAGE C009 WILL NOT BE PRINTED. TO REGAIN CONTROL, SET THE I-REG TO /0078 AND PRESS START. IF THIS PROCEDURE FAILS, RECALL DIMAL WITH THE CALL CARD OR PAPER TAPE.

H. UPON COMPLETION OF ALL THE PROGRAMS IN THE SEQUENCE, DIMAL WILL PRINT MESSAGE C009 TO SELECT PID. A NEW PID MAY NOW BE SELECTED.

I 3.4 PROGRAM WAITS I

PROGRAM WAITS IN DIMAL ARE IDENTIFIED BY REFERENCING THE B REG.
THE WAITS MAY BE DIVIDED INTO FIVE GROUPS-

1. NORMAL WAIT AFTER TYPED MESSAGES (B-REG=/3000).
2. CARD READER FAILURE WAIT B-REG=/30F5.
 - 2.1 REMOVE CARDS FROM HOPPER.
 - 2.2 NPRO CARD FROM FEED PATH.
 - 2.3 PLACE LAST TWO CARDS IN STACKER IN FRONT OF HOPPER CARDS AND READY INPUT DEVICE.
3. FAILURE WAITS IN HEADER TEST OR COLD START LOADER. REFER TO APPENDIX SECTION 6.2 FOR EXPLANATION OF WAITS.
4. FAILURE WAITS IN THE LOADER/ORGANIZER SECTION. EXPLANATION OF WAITS AND CORRECTIVE ACTIONS ARE GIVEN BELOW.

WAIT	EXPLANATION	ACTION
30A1	THIS WAIT INDICATES THAT THERE ARE NO MORE AVAILABLE CYLINDERS ON WHICH TO STORE THE DIAGNOSTIC FUNCTION TESTS.	IF THERE HAS BEEN A LARGE AMOUNT OF DELETE PROGRAM ACTIVITY ON THE DIMAL PACK, RELOADING ALL DFT'S WILL BE NECESSARY TO MAKE MORE CYLINDERS AVAILABLE.
30A2	THIS WAIT INDICATES THAT PATCHES EXCEEDED ONE CYLINDER IN LENGTH (2560 WORDS).	SOME PATCHES MUST BE DELETED OR NO MORE PATCHED PROGRAMS ARE ALLOWED TO BE ADDED TO THE PACK. REFER TO SECTION 3.2.9 FOR DELETE PATCH PROCEDURE.
30E1	THIS WAIT INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO READ THE SECTOR ID.	RELOAD THE PROGRAM. THE CYLINDER ON WHICH THE ATTEMPTED READ WAS BEING MADE WILL BE BYPASSED.

30E3 THIS WAIT INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO WRITE ON THE DISK. RELOAD THE PROGRAM. THE CYLINDER ON WHICH THE ATTEMPTED WRITE WAS BEING MADE WILL BE BYPASSED.

5. FAILURE WAITS IN THE SELECT/EXECUTE SECTION. EXPLANATION OF WAITS AND CORRECTIVE ACTIONS ARE GIVEN BELOW.

WAIT	EXPLANATION	ACTION
30E4	THIS WAIT INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO WRITE ON THE DISK.	RELOAD THE PROGRAM. THE CYLINDER ON WHICH THE ATTEMPTED WRITE WAS BEING MADE WILL BE BYPASSED.
30E5	THIS WAIT INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO READ DISK.	IF IT IS DESIRED TO EXECUTE THOSE PROGRAMS LOADED, PRESS START. IF THAT FAILS RECALL THE SELECT/EXECUTE.

I 3.5 RESTART PROCEDURE I

1. DIMAL INITIAL LOADER SECTION

THERE IS NO RESTART PROCEDURE DURING THE IPL OPERATION. RESTART IS AVAILABLE ONCE THE INITIAL LOADER IS IN CORE.

2. DIMAL COLD START LOADER SECTION

DEPRESS STOP, RESET AND START. THE COLD START LOADER WILL ATTEMPT A RELOAD OF THE SPECIFIED DIMAL SECTION.

3. DIMAL LOADER/ORGANIZER SECTION

A. INITIAL DISK PACK GENERATION.

THERE IS NO RESTART PROCEDURE DURING THIS PHASE.

-SUGGESTION-

LOAD ONLY ONE PROGRAM ON DISK DURING THIS PHASE. OTHER PROGRAMS MAY BE ADDED USING THE 'ADD A PROGRAM' OPTION. REFER TO SECTION 3.2.2.

B. DISK PACK MODIFICATION

PRESS STOP, RESET AND START. MESSAGE C004 SHOULD BE PRINTED. OPTIONS MAY NOW BE SELECTED.

.....
I 4. DIMAL SELECT/EXECUTE SECTION I
.....

- A. IF MONITOR IS IN CORE RESTART BY SETTING ENTRY SWITCHES TO /8080 AND PRESSING INTERRUPT KEY.
- B. IF SELECT/EXECUTE IS IN CORE PRESS STOP, RESET, AND START.

5. DIMAL HEADER SECTION

TO RESTART THE HEADER FROM TEST 1, RE-ENTER THE CALL CARD. REFER TO SECTION 3.2.1 OR 3.3.1.

*** VERY IMPORTANT NOTE ***

IF THE RESTART PROCEDURES FAIL TO PROVIDE THE DESCRIBED RESULTS RECALLING DIMAL WILL BE NECESSARY. REFER TO AREA OF INTEREST IN THE DOCUMENTATION.

4.0 PRINTOUTS

4.1 STATUS MESSAGES

I LOADER/ORGANIZER I

A003 DISK NOT READY

THIS PRINTOUT INDICATES THAT THE DISK DRIVE IS NOT READY. WAIT UNTIL 'FILE READY' LIGHT COMES ON.

I SELECT/EXECUTE I

A004 DISK NOT READY

THIS MESSAGE INDICATES THAT THE DISK DRIVE IS NOT READY. WAIT UNTIL 'FILE READY' LIGHT COMES ON.

A005 PROGRAM XX NOT ON DISK

THIS MESSAGE INFORMS THE C.E. THAT THE PROGRAM SELECTED WAS NOT FOUND ON DISK. THE SAME MESSAGE IS PRINTED FOR EACH PID NOT FOUND ON DISK DURING THE SELECTION OF SEQUENTIAL PIDS.

A006 PROGRAM EXCEEDS CORE LIMIT

THIS PRINTOUT INDICATES THAT THE DFT SELECTED EXCEEDS THE MAXIMUM ALLOWABLE LIMIT. ANOTHER PROGRAM MUST BE SELECTED. ALL PREVIOUSLY SELECTED PROGRAMS SHOULD BE AVAILABLE FOR EXECUTION.

I INITIAL LOADER I

A007 DISK NOT READY

THIS MESSAGE INDICATES THAT THE DISK DRIVE IS NOT READY. WAIT UNTIL 'FILE READY' LIGHT COMES ON.

4.2 COMMAND MESSAGES

I LOADER/ORGANIZER I

C001 SET SMS TO /FF00 IF DONE

THIS MESSAGE IS PRINTED BY THE LOADER/ORGANIZER SECTION WHEN THE LAST CARD SEQUENCE HAS BEEN PERFORMED ON INITIAL DISK PACK GENERATION OR WHEN USING THE ADD PROGRAM FEATURE.

IF ALL DESIRED PROGRAMS HAVE BEEN LOADED ON DISK, SET CONSOLE SWITCHES TO FF00 AND PRESS START.

IF MORE PROGRAMS ARE TO BE LOADED, READY THE INPUT DEVICE WITH DFT PROGRAMS AND PRESS START.

C002 ENTER PID (00XX) TO DELETE IN SMS.

THIS PRINTOUT OCCURS AS A RESULT OF SELECTING THE DELETE PROGRAM OPTION. ENTER THE PID OF THE PROGRAM TO DELETE IN SWITCHES 8 THROUGH 15. THE PROGRAM PID WILL BE DELETED. A NEW LOCATION DIRECTORY IS AN AUTOMATIC FUNCTION OF THE DELETE PROGRAM OPTION.

THIS MESSAGE ALSO OCCURS WHEN SELECTING THE 'DELETE PATCH CARD' OPTION.

C004 SELECT OPTIONS

THIS MESSAGE INDICATES THAT THE DIMAL LOADER/ORGANIZER IS READY TO BE USED. SELECT THE OPTION DESIRED (REFER TO SECTION 3.2 FOR OPERATING INSTRUCTIONS) AND PRESS START.

C005 RDY 1442 WITH BLANK CARDS

THIS MESSAGE OCCURS DURING THE PUNCH CALL CARD OPTION. READY THE 1442 CRP WITH BLANK CARDS AND PRESS START. THE CARD PUNCHED IS THE CALL CARD. SAVE THIS CARD.

C006 ENTER INPUT DEVICE 1442,2501,1134.

THIS MESSAGE IS PRINTED DURING THE INITIAL PACK GENERATION AND IN THE LOADER/ORGANIZER PHASE OF DIMAL. ENTER IN THE CONSOLE SWITCHES THE ACTUAL NUMBER IN HEX OF THE DEVICE.

C007 READY THE INPUT DEVICE.

THIS MESSAGE IS PRINTED IN THE LOADER ORGANIZER SECTION WHEN EVER THE INPUT DEVICE GOES NOT READY.

C008 ENTER PID OF PROGRAM TO BE PATCHED VIA SMS.

THIS MESSAGE IS PRINTED DURING SELECT OPTION 2 IN THE LOADER/ORGANIZER PHASE. REFER TO SECTION 3.2.4.

I SELECT/EXECUTE I

C009 SELECT PROGRAM PID (00XX)

THIS PRINTOUT INFORMS THE C.E. TO ENTER THE PID OF THE PROGRAM TO BE EXECUTED VIA CONSOLE ENTRY SWITCHES 8 THROUGH 15.

C00A YOU HAVE SELECTED PID XX

THIS MESSAGE FOLLOWS MESSAGES C009 AND C011. IT MERELY TELLS THE CE OF HIS PID SELECTION.

C010 SET SW 0 ON FOR SEQ PIDS.

THIS MESSAGE REQUESTS SETTING SW 0 ON FOR PROCESSING SEQUENTIAL PIDS.

C011 ENTER LAST PID OF SEQ.

THIS MESSAGE FOLLOWS MESSAGE C010 REQUESTING THE LAST PID IN THE SEQUENCE TO BE PROCESSED. ENTER IN SMS 8 THROUGH 15.

C012 SET SW 15 ON FOR OVERLAP.

THIS PRINTOUT OCCURS AFTER MESSAGE C011 INFORMING THE C.E. TO SET SW 15 ON IF HE DESIRES OVERLAP OPERATION.

I INITIAL LOADER I

C013 READY INPUT DEVICE.

THIS MESSAGE REQUESTS THAT THE INPUT DEVICE BE MADE READY. PLACE THE DIMAL DECK IN THE HOPPER AND PRESS THE READER START BUTTON.

C014 ENTER CE CYLINDER NUMBER.

THIS PRINTOUT OCCURS DURING INITIAL PACK GENERATION. ENTER IN CONSOLE ENTRY SWITCHES /00C7 AND PRESS START.

IMPORTANT NOTE- IF THE CE HISTORY TRACK WAS FOUND TO BE BAD DURING THE RUNNING OF THE DISK INITIALIZATION TEST (PID 0308), THEN THE HISTORY TRACK MUST BE ASSIGNED BY THE CE AND ENTERED IN THE SWITCHES AS EXPLAINED ABOVE.

C015 AREA CODE (XX00).

THIS MESSAGE IS PRINTED DURING INITIAL PACK GENERATION ONLY. ENTER IN THE CONSOLE SWITCHES THE AREA CODE OF THE DISK DRIVE. PRESS START.

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EC NO. 420403 420403A

PROG ID 0302-
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4.3 DATA MESSAGES

I LOADER/ORGANIZER I

D001 LOCATION DIRECTORY	
PID	CYL SECT TSEC
02	XXX 0 07 (1)
02	XXX 7 01 (2)
02	XXX 0 10 (3)
	XXX 0 (4)
02	XXX 0 06 (5)
XX	XXX X XX (6)
	XXX 0 (7)

MESSAGE D001 IS THE LISTING OF THE LOCATION DIRECTORY

PID = THE PROGRAM ID
CYL = THE FIRST CYLINDER (IN DECIMAL) ON WHICH THE PROGRAM IS STORED.
SECT = THE FIRST SECTOR ON THE DESIGNATED CYLINDER USED BY THE PROGRAM
TSEC = TOTAL NUMBER OF SECTORS (IN DECIMAL) REQUIRED TO STORE THE PROGRAM.

LINES 1,2,3,4, AND 5 (LINE NUMBERS ARE NOT PRINTED) DEFINE THE LOCATION OF THE DIMAL SYSTEM ON THE DISK
LINE 1 IS THE HEADER TEST LOCATION
LINE 2 IS THE COLD START LOADER LOCATION
LINES 3 + 4 ARE THE LOADER/ORGANIZER SECTION LOCATION.
LINE 5 IS THE SELECT/EXECUTE SECTION LOCATION.

LINE 6 WILL DEFINE THE LOCATION OF THE FIRST DFT LOADED.

LINE 7 WILL BE PRINTED WHEN MORE THAN ONE CYLINDER IS REQUIRED TO STORE THE PROGRAM. SECTOR 0 WILL ALWAYS BE THE FIRST SECTOR USED.

ALL DFT'S WILL BE LISTED IN THE FORMAT OF LINES 6 AND 7. SAVE THE PRINTOUT FOR REFERENCE.

D002 PATCH CARD TABLE

ALL THE PATCHES CONTAINED ON THE DISK PACK ARE LISTED. THE FORMAT FOR THE PRINTOUT IS THE HEXIDECIMAL CONTENT OF EACH PATCH CARD READ. SAVE PRINTOUT FOR REFERENCE. A SAMPLE PRINTOUT IS GIVEN BELOW

A20C 4000 013B 0001 0000 0000 0000 0000 0000 0000 0000

WHERE A2 IS THE PID, 0C IS THE NUMBER OF ITEMS ON EACH CARD PLUS TWO WORDS- THE TWO WORDS ARE THE PIC AND RELOCATION FACTOR- 4000 IS THE RELOCATION WORD, 013B IS THE ADDRESS WHERE THE DATA WILL GO, THE REST OF THE CARD IS DATA.

D003 DATA SW CALL SEEK COUNT IS XX

MESSAGE D003 INFORMS THE OPERATOR OF THE SEEK COUNT REQUIRED IN THE BIT SWITCH CALL ROUTINE. THIS NUMBER IS IN HEXIDECIMAL AND SHOULD BE INSERTED AS /00XX.

D004 PID TABLE.

MESSAGE D004 IS THE LISTING OF ALL THE PROGRAMS ON DISK. EACH PID IS GIVEN AS A TWO DIGIT NUMBER. THE FIRST FOUR PIDS (02 02 02 02) ARE THE DIMAL SECTIONS AND WILL ALWAYS APPEAR BEFORE THE OTHER PIDS.

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4.4 ERROR MESSAGES

I LOADER/ORGANIZER I

E002 DISK SEEK ERROR, PRESS START

THIS MESSAGE INDICATES THAT A SEEK ERROR HAS OCCURED, PRESS START TO TRY AGAIN. IF ERROR PERSISTS SEVERAL TIMES, REINITIALIZE DISK AND RELOAD DIMAL.

E004 PATCH CARD ERROR

THIS MESSAGE INDICATES THAT A CARD WITH A PUNCH OTHER THAN A '12' PUNCH IN COLUMN 1 OF THE PATCH CARD OR A BLANK CARD HAS BEEN DETECTED. CHECK THE PATCH CARDS AND REENTER AFTER CORRECTIONS.

E005 CHECKSUM ERROR

THIS MESSAGE INDICATES THAT A CHECKSUM ERROR HAS BEEN DETECTED DURING CARD READ OPERATIONS.

REMOVE THE CARDS FROM THE HOPPER. NPRO THE CARDS FROM THE FEED PATH. THE LAST TWO CARDS IN THE STACKER ARE TO BE CORRECTED AND PLACED IN FRONT OF THE CARDS FROM THE HOPPER. RELOAD CARDS & READY INPUT DEVICE. THE FIRST CARD ENTERING THE STACKER IS THE CARD WHICH CAUSED THE CHECKSUM ERROR. CHECKSUM IS CAUSED BY CARDS OUT OF SEQUENCE OR BY FAULTY PUNCHES (TORN, LACED, ETC.). CORRECT THE DECK AND PLACE IN THE HOPPER. DO NOT RELOAD THOSE CARDS WHICH HAVE BEEN ACCEPTED. READY THE CARD READER AND PRESS THE 1131 CPU START.

INCASE OF CONSECUTIVE CHECKSUM ERRORS, THE FOLLOWING PROCEDURE IS RECOMMENDED. REMOVE THE DECK CAUSING THE CONTINUOUS CHECKSUM ERROR. AT THE 1131 CPU, SET CONSOLE SWITCH 8 AND PRESS START. MESSAGE C007 WILL BE PRINTED. LOAD CARDS IN READER AND MAKE IT READY. THIS EXACT PROCEDURE MUST BE FOLLOWED TO CONTINUE LOADING.

THE DECK CAUSING THE CHECKSUM ERROR MAY BE ADDED LATER AFTER IT HAS BEEN CORRECTED. REFER TO SECTION 3.2.2.

I SELECT/EXECUTE I

E009 PIDS ARE INVERTED.

THIS MESSAGE INDICATES THAT THE LAST PID IN THE SEQUENCE IS LESS THAN THE FIRST PID ENTERED. AT THE 1131 CPU PRESS THE START BUTTON. MESSAGE C009 IS PRINTED ASKING THE CE TO SELECT PID. REENTER THE PID CORRECTLY.

E00A DISK SEEK ERROR. PRESS START.

THIS MESSAGE INDICATES THAT A SEEK ERROR HAS OCCURRED. PRESS START TO TRY AGAIN. IF ERROR PERSISTS SEVERAL TIMES, REINITIALIZE THE DISK AND RELOAD DIMAL.

E00B PIDS ARE INCOMPATIBLE

THIS PRINTOUT OCCURS IF THE LAST PID SELECTED DURING THE SELECTION OF SEQUENTIAL PIDS IS A DIFFERENT TYPE THAN THE FIRST PID ENTERED. ALL MONITOR CONTROLLED PROGRAMS HAVE PIDS LESS THAN 9F. ALL NON-MONITOR PROGRAMS HAVE PIDS GREATER THAN 79F. PRESS THE START BUTTON ON THE 1131 CPU. MESSAGE C009 IS PRINTED (SELECT PID 00XX). REENTER THE PIDS CORRECTLY.

EXAMPLE OF THE ABOVE ERROR-
FIRST PID ENTERED (0031), LAST PID ENTERED (00A1).

I INITIAL LOADER I

E00C DISK SEEK ERROR, PRESS START

THIS MESSAGE INDICATES THAT A SEEK ERROR HAS OCCURED, PRESS START TO TRY AGAIN. IF ERROR PERSISTS SEVERAL TIMES, REINITIALIZE DISK AND RELOAD DIMAL.

E00D DISK WRITE ERROR.

THIS MESSAGE INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO WRITE ON THE DISK. THE PROGRAM BEING LOADED AT THE TIME THE ERROR OCCURRED MUST BE RELOADED. THE CYLINDER ON WHICH THE ATTEMPTED WRITE WAS BEING MADE WILL BE BYPASSED.

E00E DISK READ ERROR.

THIS MESSAGE INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO READ THE SECTOR ID. THE PROGRAM WHICH WAS BEING LOADED AT THE TIME OF THE ERROR MUST BE RELOADED. THE CYLINDER ON WHICH THE ATTEMPTED READ WAS BEING MADE WILL BE BYPASSED.

E00F WRONG LOADER

THIS MESSAGE INDICATES THAT A WRONG LOADER IS BEING USED ON INPUT DEVICE. CHECK THE LOADER AND RELOAD DIMAL.

E016 END CARD OUT OF ORDER.

THIS PRINTOUT INFORMS THE CE THAT THE DIMAL DECK HAS SOME CARDS OUT OF SEQUENCE. CHECK DIMAL FOR MISSING CARDS. (ESPECIALLY END CARDS, OR FOR OUT OF SEQUENCE CARDS) RELOAD.

E017 CE WORD NOT FOUND ON DISK.

THIS MESSAGE OCCURS IF THE CE WORD (/CEDC) WAS NOT FOUND ON THE CE HISTORY TRACK. PRESS THE 1131 CPU START BUTTON TO SEARCH FOR IT AGAIN. IF THE RETRY FAILS, THE DISK PACK MUST BE REINITIALIZED AGAIN (PID 0308).

E018 DISK HAS MORE THAN 3 BAD CYLINDERS.

THIS MESSAGE INDICATES THAT THERE ARE MORE THAN 3 BAD CYLINDERS ON THE PACK. IT IS RECOMMENDED THAT THE PACK BE REPLACED WITH A NEW PACK. PROCEEDING MAY CAUSE OTHER PROBLEMS.

E019 CHECKSUM ERROR.

THIS MESSAGE INDICATES THAT A CHECKSUM ERROR HAS BEEN DETECTED DURING CARD READ OPERATIONS.

AT THE CARD READER, REMOVE THE CARDS FROM THE HOPPER. DEPRESS THE NPRO BUTTON. THE FIRST CARD ENTERING THE STACKER IS THE CARD WHICH CAUSED THE CHECKSUM ERROR. CHECK IF THAT CARD WAS IN CORRECT SEQUENCE (IMPROPER SEQUENCE WILL CAUSE CHECKSUM ERRORS). IF CARDS WERE OUT OF SEQUENCE, CORRECT AND PLACE IN THE READ HOPPER. DO NOT RELOAD THOSE CARDS WHICH HAVE BEEN ACCEPTED. READY THE READER AND PRESS CPU START BUTTON.

I 5. COMMENTS I

THE DIMAL SYSTEM IS DIVIDED INTO 5 MAJOR SECTIONS

1. DIMAL INITIAL LOADER
2. DIMAL HEADER SECTION
3. DIMAL COLD START LOADER
4. DIMAL LOADER/ORGANIZER SECTION
5. DIMAL SELECT/EXECUTE SECTION

5.1 INITIAL LOADER

THE INITIAL LOADER FUNCTION IS TO INPUT THE DIMAL OBJECT DECK, WRITE IT ON THE DISK AND THEN CALL IN THE COLD START LOADER WHICH IN TURN INPUTS THE LOADER/ORGANIZER SECTION. THE LOADER/ORGANIZER SECTION IS THEN USED TO INPUT THE DFT'S FOR INCLUSION ON THE DISK PACK.

THE INITIAL LOADER WILL MAKE A CHECK TO INSURE THAT THE C.E. PACK HAS BEEN PLACED ON THE SPECIFIED DRIVE. THIS IS DONE BY READING SECTOR 3 OF THE HISTORY TRACK AND CHECKING WORD 2 FOR /CEDC. THE LOADER WILL THEN DEFINE THE FIRST EIGHT USABLE CYLINDERS, STARTING AT CYLINDER 6, AS THE DIMAL CYLINDERS. THESE CYLINDERS ARE USED AS FOLLOWS-

- 1ST CYLINDER - HEADER TEST AND COLD START LOADER.
- 2ND CYLINDER - LOADER/ORGANIZER
- 3RD CYLINDER - LOADER/ORGANIZER
- 4RD CYLINDER - SELECT/EXECUTE SECTION
- 5TH CYLINDER - WORK CYLINDER 1
- 6TH CYLINDER - WORK CYLINDER 2
- 7TH CYLINDER - LOCATION DIRECTORY
- 8TH CYLINDER - PATCH CARDS

THE ADDRESSES FOR THESE CYLINDERS WILL BE PLACED IN A USE TABLE. THE USE TABLE WILL BE INCLUDED IN THE COLD START LOADER, LOADER/ORGANIZER SECTION AND THE SELECT/EXECUTE SECTION PRIOR TO WRITING THESE SECTIONS ON THE DISK.

THE DIMAL DECK IS THEN READ IN AND STORED ON THE DISK AT THE ASSIGNED CYLINDERS. UPON COMPLETION OF THE LOADER OPERATION THE INITIAL LOADER WILL WRITE THE WORD /ABCD ON SECTOR 0 OF THE HISTORY TRACK TO DEFINE THE DISK PACK AS CONTAINING DIMAL. THE LOADER THEN CALLS INTO CORE, THE COLD START LOADER AND SETS UP THE NECESSARY CONTROL TO BRING IN THE LOADER/ORGANIZER SECTION. THE INITIAL LOADER THEN BRANCHES TO THE COLD START LOADER WHICH INPUTS THE LOADER/ORGANIZER SECTION AND GIVES CONTROL TO IT.

5.2 DIMAL HEADER SECTIONS

THE PURPOSE OF THE HEADER SECTIONS IS TO TEST MOST OF THE 1130 INSTRUCTION SET. EACH TEST OCCUPIES ONE SECTOR OF THE FIRST DIMAL CYLINDER.

THE FOLLOWING INSTRUCTIONS ARE NOT CHECKED BY THE HEADER SECTION.

DOUBLE ADD (AD)	MULTIPLY (M)
DOUBLE SUBTRACT (SD)	DIVIDE (D)
	EXECUTE I/O (XIO)

TEST 1

CHECKS OPERATION OF MDX, BSC AND EOR SHORT FORM. CHECKS THE ABILITY OF THE A REG TO HOLD 1'S, TO LOAD 1'S ON TOP OF 1'S AND TO LOAD 0'S ON TOP OF 1'S. ALSO CHECKED IS THE FLAG BIT AND INDIRECT ADDRESSING.

TEST 2

CHECKS DATA ENTRY SWITCHES. CHECK INSTRUCTION BSI, SRA, AND, OR, MDX LONG, RTE AND SRT.

TEST 3

CHECKS INSTRUCTIONS RTE, SLA, SLT, STO AND STS.

TEST 4

CHECKS INSTRUCTIONS BSC, BSI AND LDX.

TEST 5

CHECKS INSTRUCTIONS LDX, STX AND A.

TEST 6

CHECKS INDEXING, BSC INDEXED, MDX, AND SUBTRACT INSTRUCTIONS

TEST 7

CHECKS INSTRUCTIONS SLC, SLCA, LDD, AND STD.

THE HEADER SECTION CONTAINS THE CONTROL NECESSARY FOR LOOPING ERRORS, LOOPING INSTRUCTIONS, AND BYPASSING ERROR WAITS DURING TROUBLE SHOOTING. REFER TO SECTION 6.2 FOR HEADER TEST ERROR PROCEDURES.

5.3 COLD START LOADER

IT IS THE FUNCTION OF THE COLD START LOADER TO INPUT THE DIMAL SECTION SPECIFIED BY THE COLD START CALL CARD OR TAPE.

DURING INITIAL DIMAL DISK PACK GENERATION, THE INITIAL LOADER CALLS THE COLD START LOADER TO INPUT THE LOADER/ORGANIZER SECTION OF DIMAL.

DURING ONE CARD, PAPER TAPE, OR CONSOLE ENTRY SWITCH CALLS, THE COLD START LOADER IS BROUGHT INTO CORE BY HEADER TEST 7 AFTER SUCCESSFUL OPERATION OF THE HEADER SECTION. THE COLD START LOADER THEN REFERENCES A CONSTANT CONTAINED IN THE CALL (LOCATION /000F) TO DETERMINE WHICH DIMAL SECTION TO LOAD. IT WILL LOAD THAT SECTION AND BRANCH TO IT.

THE COLD START LOADER IS STORED ON SECTOR 7 OF THE FIRST DIMAL CYLINDER AND IS LOADED INTO CORE AT LOCATION /0DAC.

5.4 DIMAL LOADER/ORGANIZER SECTION

IT IS THE FUNCTION OF THE LOADER/ORGANIZER SECTION TO INPUT THE DIAGNOSTIC PROGRAMS AND WRITE THEM ON THE DISK PACK. THIS SECTION IS ALSO USED TO MODIFY A PREVIOUSLY GENERATED DIMAL PACK.

THE LOADER/ORGANIZER SECTION IS CALLED FROM DISK BY THE INITIAL LOADER.

WHEN GENERATING A NEW PACK, THIS SECTION WILL FIRST UPDATE THE LOCATION DIRECTORY TO INCLUDE THE LOCATION OF THE DIMAL SYSTEM ON THE DISK PACK. THE SECTION THEN PREPARES TO INPUT THE PROGRAM DECKS. PRIOR TO USING ANY CYLINDER FOR PROGRAM STORAGE, THE CYLINDER IS CHECKED FOR A USABLE CONDITION. ALL BAD CYLINDERS ARE BYPASSED. A BAD CYLINDER IS DEFINED AS A CYLINDER WHERE ALL SECTORS CAN'T BE PROPERLY WRITTEN AND READ.

THE PROGRAMS ARE STORED ON DISK ACCORDING TO THE FOLLOWING SCHEME.

- A) PROGRAMS WITH PIDS GREATER THAN /009F, ARE NON MONITOR DEPENDENT PROGRAMS AND ARE STORED ON DISK IN CORE IMAGE, 320 WORDS PER SECTOR.
- B) PROGRAMS WITH PIDS LESS THAN /009F, ARE MONITOR DEPENDENT PROGRAMS AND ARE STORED ON DISK IN CARD IMAGE, 4 CARDS PER SECTOR.

*** VERY IMPORTANT NOTE ***

MONITOR CONTROLLED PROGRAMS (PIDS 9F AND LESS) SHOULD NOT HAVE MORE THAN 256 CARDS PER DECK.

THE IMAGE USED IS ENTERED IN THE IMAGE INDICATOR (0-CORE IMAGE, 1 = CARD IMAGE) WHICH IS CONTAINED IN THE LOCATION DIRECTORY ENTRIES FOR EACH PROGRAM.

CARD 1 (HEADER CARD) OF THE 12-4 DECKS IS NOT STORED ON THE DISK NOR ARE THE CARDS WHICH CONTAIN THE WAIT OR TRAP CONSTANTS USED IN THE WAIT DESCRIPTION AT THE FRONT OF THE PROGRAM LISTING. THESE ARE IDENTIFIED BY ADDRESS STARTING AT 3001 OR 7001.

WHEN WRITING PROGRAMS ON DISK IN CORE IMAGE, ALL BLOCKS OF STORAGE RESERVED BY THE PROGRAM (DEFINED BY BSS STATEMENTS) ARE WRITTEN AS ZEROS ON DISK.

THE NUMBER OF SECTORS USED, THE ADDRESSES OF ALL CYLINDERS USED, THE PROGRAM ORG ADDRESS AND THE PROGRAM TRANSFER ADDRESS ARE SAVED FOR INCLUSION IN THE LOCATION DIRECTORY.

THE LOCATION DIRECTORY IS UPDATED FOR EACH PROGRAM UPON ENTERING /FF00 IN THE ENTRY SWITCHES. THE LOCATION DIRECTORY FORMAT FOLLOWS -

0 7 8 15

* PROGRAM PID * TYPE *

* TOTAL SECTORS* TOTAL CYLINDERS *

* ORG. ADDRESS *

* 1ST CYLINDER ADDRESS *

* 2ND CYLINDER ADDRESS *

* 3RD CYLINDER ADDRESS *

* 4TH CYLINDER ADDRESS *

* 5TH CYLINDER ADDRESS *

* 6TH CYLINDER ADDRESS *

* 7TH CYLINDER ADDRESS *

* 8TH CYLINDER ADDRESS *

* PROGRAM TRANSFER ADDRESS *

BIT 15 OF THE FIRST ENTRY IS THE IMAGE INDICATOR DESCRIBED PREVIOUSLY.

IF A PROGRAM DOES NOT REQUIRE 8 CYLINDERS FOR STORAGE, THEN ZEROS ARE PLACED AS ADDRESSES. REGARDLESS OF HOW MANY CYLINDERS USED, THE FORMAT OF THE TABLE WILL ALWAYS BE THE SAME. (TWELVE ENTRIES PER TABLE).

IF A PROGRAM HAS PATCH CARDS BEHIND IT, THE PATCH CARDS WILL BE ENTERED IN THE PATCH TABLE ALONG WITH THE PID OF THAT PROGRAM. ALL PREVIOUS PATCHES FOR THAT PID WILL BE DELETED.

AS EACH NEW PROGRAM IS READ IN, IT WILL BE WRITTEN ON THE NEXT AVAILABLE SECTOR. THEREFORE A PROGRAM MAY START ON ANY SECTOR OF THE CYLINDER PRESENTLY BEING USED. AFTER SECTOR 7 HAS BEEN WRITTEN, PROGRAM STORAGE WILL CONTINUE ON THE NEXT SEQUENTIAL AVAILABLE CYLINDER, SECTOR ZERO. TRACKS 90-110 AND 199 ARE NOT USED.

WHEN ALL PROGRAMS HAVE BEEN WRITTEN ON THE DISK, THE LOADER/ORGANIZER SECTION WILL SAVE THE NEXT AVAILABLE STORAGE SECTOR BY WRITING ITS ADDRESS ON SECTOR 0, WORD 3 OF THE CE HISTORY TRACK. THE SECTION THEN LISTS THE CONTENTS OF THE LOCATION DIRECTORY AND PRINTS A SEEK COUNT TO BE USED WHEN ENTERING THE CALL VIA THE ENTRY SWITCHES

SUBROUTINE DLPGM IS USED TO DELETE PROGRAMS. THIS SUBROUTINE REMOVES ALL ENTRIES FROM THE LOCATION DIRECTORY WHICH PERTAIN TO THE PID SPECIFIED TO BE DELETED. A NEW LISTING OF THE LOCATION DIRECTORY FOLLOWS AUTOMATICALLY. (THE PROGRAM ITSELF IS NOT ERASED FROM THE DISK, ONLY THE LOCATION DIRECTORY ENTRIES).

5.5 DIMAL SELECT/EXECUTE SECTION

*** NOTE ***

INTERRUPT REQUEST KEY AND START BUTTON PERFORM THE SAME FUNCTION IN THIS SECTION.

THE PURPOSE OF THIS SECTION IS TO CALL INTO CORE, FROM DISK, THE DIAGNOSTIC PROGRAM SPECIFIED BY THE OPERATOR.

THE SELECT/EXECUTE SECTION IS CALLED INTO CORE BY AN IPL CALL CARD, A PAPER TAPE CALL STRIP, OR A CALL ROUTINE ENTERED VIA THE SWITCHES.

THE SELECT/EXECUTE SECTION IS DIVIDED INTO TWO PARTS, A RESIDENT PORTION, AND THE MAIN BODY OF THE SECTION.

THE RESIDENT PORTION PERMANENTLY RESIDES IN CORE FROM LOCATION /001F THROUGH /0160. ALL PROGRAMS WHICH RETURN TO DIMAL WILL DO SO VIA THE INTERFACE ENTERING AT LOCATION /0078. THE MAIN PORTION OF DIMAL ALSO ENTERS THE RESIDENT PORTION TO LOAD ABSOLUTE PROGRAMS OR PRIOR TO TRANSFERRING CONTROL TO A MONITOR PROGRAM.

THE MAIN BODY OF THE SELECT/EXECUTE SECTION SHARES CORE LOCATIONS /0160 TO /050C WITH EITHER MONITOR OR A NON MONITOR PROGRAM

WHEN A PROGRAM HAS BEEN ENTERED IN THE CONSOLE ENTRY SWITCHES FOR SELECTION, THE DIMAL SECTION WILL DETERMINE WHETHER THE PROGRAM IS MONITOR DEPENDENT OR STAND-ALONE, NON MONITOR DEPENDENT.

I STAND ALONE PROGRAMS I

IF A STAND-ALONE PROGRAM IS BEING REQUESTED, THE SELECT/EXECUTE SECTION WILL SEARCH THE LOCATION DIRECTORY FOR THAT PID. WHEN THE PID IS FOUND, ITS LOCATION ON DISK WILL BE STORED IN THE RESIDENT SECTION AND CONTROL GIVEN TO THE RESIDENT SECTION.

THE RESIDENT SECTION WILL INPUT THE SELECTED DIAGNOSTIC PROGRAM AND BRANCH TO IT. DIMAL CONTROL IS LOST AT THIS POINT UNLESS THE PROGRAM PROVIDES A BRANCH TO LOCATION /0078.

THE DIMAL SECTION MAY BE RELOADED BY SETTING THE I REG TO HEX /0078 AND CONTINUING FROM THAT POINT. IF SEQUENTIAL PIDS ARE TO BE EXECUTED, THE SELECTION OF THE NEXT PID IS AUTOMATIC.

I DIAGNOSTIC MONITOR DEPENDENT PROGRAMS I

DIMAL IN NO WAY AFFECTS THE OPERATION OF THE DIAGNOSTIC MONITOR.

WHEN THE PID ENTERED IN THE CONSOLE ENTRY SWITCHES IS A DIAGNOSTIC MONITOR DEPENDENT PROGRAM, THE DIMAL SECTION WILL PUT MONITOR ON WORKING CYLINDER ZERO.

DIMAL WILL LOCATE THE SELECTED PROGRAM ON DISK, LOAD IT INTO CORE, RELOCATE IT, EFFECT A CORE SWAP OF DIMAL AND MONITOR, AND BRANCH TO THE PROGRAM JUST LOADED.

UPON PROGRAM TERMINATION, THE MONITOR WILL RETURN TO THE INTERFACE SECTION, AGAIN THE CORE SWAP WILL OCCUR AND THE DIMAL SECTION WILL SET UP TO ALLOW SELECTION OF THE NEXT DIAGNOSTIC PROGRAM. IN THE OVERLAP MODE OF OPERATION, THE DM WILL RETURN TO DIMAL AFTER EACH PROGRAM HAS BEEN LOADED FOR THE NEXT PROGRAM SELECTION. TO INDICATE THAT THE LAST PROGRAM IS LOADED, SWITCHES 8 THROUGH 15 SHOULD BE SET TO 00FF.

TO RETURN TO DIMAL FROM OVERLAP OPERATIONS, REFER TO MONITOR -LOAD PROGRAM OPTION.

6. APPENDIX

6.1 CONSOLE ENTRY SWITCHES CALL ROUTINE.

THIS ROUTINE MAY BE USED TO CALL DIMAL FROM DISK TO CORE STORAGE.. TO ENTER THE CALL ROUTINE PROCEED AS FOLLOWS-

1. MOUNT THE DIMAL PACK AS EXPLAINED IN SECTION 3.3.1.
2. SET THE MODE SWITCH TO LOAD.
3. INSURE THAT THE I COUNTER IS AT /0014.
4. ENTER THE HEX INSTRUCTIONS PROVIDED ON THE NEXT PAGE IN THE ENTRY SWITCHES PRESSING THE START BUTTON AFTER EACH ENTRY.

I *** VERY IMPORTANT NOTE *** I

MAKE SURE THAT YOU ENTER THE CALL SEEK COUNT IN LOCATION /004A OF THIS ROUTINE.

5. AFTER ALL THE INSTRUCTIONS HAVE BEEN ENTERED, SET THE BEGINNING ADDRESS /0019 IN THE CONSOLE ENTRY SWITCHES, PRESS THE LOAD IAR BUTTON. SET THE MODE SWITCH TO RUN, PRESS START.
6. THE ROUTINE WILL WAIT (300A) AT LOCATION /0021 SET DISK AREA CODE IN ENTRY SWITCHES 0-8 AT THIS WAIT.
7. THE ROUTINE WILL WAIT (300C) AT LOCATION /0025 SET THE CALL CODE AT THE WAIT. THE CODE IS /0001 FOR LOADER ORGANIZER, /0002 FOR SELECT EXECUTE.

CALL ROUTINE

LOCATION*	INSTRUCTIONS*	LABEL*	OPER*	FT*	OPERAND *	REMARKS
0014	000C	INTP	DC	*--		
0015	0C00	0046	XIO	L	RESAT-1	SENSE-NORESET
0017	4CC0	0014	BOSC	I	INTP	RESET INTR +EXIT
0019	6500	0014	LDX	L1	INTP	PICKUP INTR VCTR
0018	6D00	000A	STX	L1	/000A	STORE IN LOC A
001D	6500	0141	LDX	L1	/0141	LOAD WORD COUNT
001F	6D00	004E	STX	L1	/004E	STORE IN LOC 4E
0021	300A		WAIT	/A		ENTER AREA CODE
0022	0807		XIO	R	RBITS	READ DATA ENT SW
0023	C008		LD		ADRS	LOAD CONTENTS
0024	D0E9		STO		/000E	STORE IN LOC E
0025	300C		WAIT	/C		ENTER TYPE OF CALL
0026	0803		XIO	R	RBITS	READ DATA ENT SW
0027	C004		LD		ADRS	LOAD CONTENTS
0028	D0E6		STO		/000F	STORE IN LOC F
0029	7003		MDX		BOOT?	BR. AROUND CONST
002A	002C	RBITS	DC		ADRS	
002B	3A00		DC		/3A00	READ DES IOCC
002C	0000	ADRS	DC	*--		
002D	0818	BOOT2	XIO		RESAT-1	SENSE DISK STATUS
002E	1002		SLA		2	TEST FOR READY NOT BUSY
002F	4808		BSC		+	SKIP IF OFF
0030	70FC		MDX		BOOT2	LOOP UNTIL READY
0031	1802		SRA		2	TEST FOR 13SD
0032	4804		BSC		E	13SD IF BIT OFF
0033	7005		MDX		B44SD	ELSE BRANCH
0034	0813	B13SD	XIO		SEEKB-1	ISSUE SEEK HOME COMMAND
0035	3002		WAIT			
0036	1004	XTAG1	SLA		4	POSITION HOME BIT
0037	4810		BSC		-	SKIP IF ON
0038	70FB		MDX		B13SD	LOOP UNTIL DISK IS HOME
0039	0810	B44SD	XIO		SEEKT-1	SEEK TO DESIRED CYLINDER
003A	3003		WAIT		3	
003B	0810		XIO		REED-1	READ ONE SECTOR
003C	3004		WAIT		4	
003D	C00C		LD		SEEKT-1	TEST FOR CORRECT CYL POSITION
003E	1003		SLA		3	POSITION BITS
003F	F00F		EOR		BOOT1+79	CHECK FOR PROPER ADDRESS
0040	4820		BSC		Z	IF YES SKIP
0041	70F2	XTAG2	MDX		B13SD	ELSE RETRY
0042	C0F3		LD		XTAG1	GET A 'NOP' INSTRUCTION
0043	D0FD		STO		XTAG2	CHANGE ABOVE 'MDX' TO A 'NOP'
0044	700C		MDX		BOOT1+81	BRANCH TO 1ST HEADER TEST
0045	0000		DC	*--		
0046	0000		DC	*--		
0047	2701	RESAT	DC		/2701	SENSE AND RESET IOCC
0048	0001		DC		1	
0049	2404	SEEKB	DC		/2404	SEEK HOME IOCC
004A	0000		DC	*--		
004B	2400	SEEKT	DC		/2400	SEEK FORWARD IOCC
004C	004E		DC		/004E	WORD COUNT ADDRESS
004D	2600	REED	DC		/2600	READ IOCC

6.2 DIMAL HEADER TEST ERROR PROCEDURE

THE HEADER TEST IS DIVIDED INTO 7 TEST SECTIONS (TESTS 1 THROUGH 7). EACH TEST SECTION HAS ITS OWN PROGRAM LISTING. TOGETHER THESE TESTS COMPRISE AN ABBREVIATION OF THE CPU FUNCTION TEST. WHEN AN ERROR PERSISTS USE THE CPU FUNCTION TEST PID 03A1 TO CORRECT THE PROBLEM.

TABLE 2 SHOWS THE FUNCTIONS OF DATA ENTRY SWITCHES 0 AND 1 IN PROVIDING ERROR ROUTINE CONTROL. SET THE SWITCHES AS DESIRED WHEN AN ERROR WAIT IS ENCOUNTERED.

TABLE 2
HEADER TEST ERROR PROCEDURE OPTIONS

```

*****
* CONSOLE ENTRY SWITCH *
* 0 1 2 3 4 5 6 7 8 9 * * DESCRIPTION
* . .
* 1.....LOOP INSTRUCTION
* 1.....BYPASS ERROR WAIT
* . .
* . .
* 0.....RETRY FAILING INSTRUCTION AND HALT IF ERROR OCCURS.
* PROGRAM WILL PROCEED IF FAILURE DOES NOT REOCCUR.
* . .
* 1.....RETRY FAILING INSTRUCTION AND BYPASS HALT IF ERROR
* OCCURS. PROGRAM WILL PROCEED IF FAILURE DOES NOT REOCCUR
* . .
* 0 1.....CONTINUOUS LOOP ON INSTRUCTION. HALT AT ERROR WAIT IF
* FAILURE OCCURS. USE THIS SETTING TO DETECT INTERMITTANT
* ERRORS, AND FOR STEPPING THROUGH A FAILING ROUTINE IN
* SINGLE INSTRUCTION MODE.
* . .
* 1.....CONTINUOUS LOOP ON INSTRUCTION. BYPASS WAIT ON ERROR.
* USE SETTING TO SCOPE A FAILING INSTRUCTION.
*****

```

A DESCRIPTION OF ALL THE WAITS FOLLOWS--

* HEADER TEST 1 WAITS. *

B-REG	ERROR WAIT COMMENTS
3004	MDX BY 1 FAILED
3005	MDX BY 2 FAILED
3006	MDX BY 2 FAILED
3007	MDX BY 4 FAILED
3008	MDX BY 4 FAILED
3009	MDX BY 4 FAILED
300A	MDX BY 4 FAILED
300B	MDX BY -2 FAILED
300C	MDX BY -2 FAILED
300D	MDX BY -2 FAILED
300E	MDX BY -2 FAILED
300F	MDX BY 8 FAILED
3010	MDX BY 8 FAILED
3011	MDX BY 8 FAILED
3012	MDX BY 8 FAILED
3013	BSC-CARRY FAILED
3014	BSC-OVERFLOW FAILED
3015	BSC-OVERFLOW SKIPPED, SHOULD NOT HAVE
3016	BSC-CARRY SKIPPED, SHOULD NOT HAVE
3017	LD ACC TO 0 FAILED
3018	LD ACC TO 0 FAILED
3019	BSC ON EVEN FAILED
301A	LOAD ACC. FAILED OR BSC ON NEG. FAILED
301B	BSC ON PLUS SKIPPED, SHOULD NOT HAVE
301C	BSC ON EVEN SKIPPED, SHOULD NOT HAVE
301D	ACC NOT # 7FFF
301E	ACC NOT # 3FFF
301F	ACC NOT # 1FFF
3020	ACC NOT # 0FFF
3021	ACC NOT # 07FF
3022	ACC NOT # 03FF
3023	ACC NOT # 01FF
3024	ACC NOT # 00FF
3025	ACC NOT # 007F
3026	ACC NOT # 003F
3027	ACC NOT # 001F
3028	ACC NOT # 000F
3029	ACC NOT # 0007
302A	ACC NOT # 0003
302B	ACC NOT # 0001
302C	ACC NOT # 0000
302D	ACC NOT # 0000
302E	ACC NOT # FFFF
302F	ACC NOT # FFFF
3030	ACC NOT # 7FFF
3031	ACC NOT # 3FFF
3032	ACC NOT # 1FFF
3033	ACC NOT # 0FFF
3034	ACC NOT # 07FF
3035	ACC NOT # 03FF
3036	ACC NOT # 01FF
3037	ACC NOT # 00FF
3038	ACC NOT # 007F
3039	ACC NOT # 003F
303A	ACC NOT # 001F
303B	ACC NOT # 000F
303C	ACC NOT # 0007
303D	ACC NOT # 0003

303E	ACC NOT # 0001
303F	ACC NOT # 0000
3040	ACC NOT # 0000
3041	ACC NOT # ZERO
3042	ACC NOT # FFFF
3043	ACC NOT # ZERO
3044	EOR OF 0 AND 0 FAILED
3045	EOR OF 1 AND 1 FAILED
3046	EOR OF 1 AND 0 FAILED
3047	EOR OF 1 AND 0 FAILED
3048	EOR OF 0 AND 1 FAILED
3049	EOR OF 0 AND 1 FAILED
304A	WRONG LOCATION LOADED
304B	WRONG LOCATION LOADED
304C	WRONG LOCATION LOADED
304D	WRONG LOCATION LOADED
304E	BSC FELL THROUGH
304F	BSC SKIPPED, SHOULD OF BRANCHED
3050	BSC E FELL THROUGH
3051	BSC SKIPPED, SHOULD OF BRANCHED
3052	BSC & FELL THROUGH
3053	BSC SKIPPED, SHOULD OF BRANCHED
3054	BSC Z FELL THROUGH
3055	BSC SKIPPED, SHOULD OF BRANCHED
3056	BSC SKIPPED, SHOULD NOT OF BRANCHED
3057	C FELL THROUGH
3058	BSC SKIPPED, SHOULD OF BRANCHED
3059	BSC 0 FELL THROUGH
305A	BSC SKIPPED, SHOULD OF BRANCHED
305B	BSC BRANCHED, SHOULD NOT OF BRANCHED
305C	BSC BRANCHED, SHOULD NOT OF BRANCHED
305E	BSC BRANCH ZERO FAILED, NOT PLUS OR NEG.
305F	BSC SKIPPED, SHOULD OF BRANCHED
3060	BSC BRANCHED NEG., SHOULD NOT HAVE
3061	BSC BRANCHED PLUS, SHOULD NOT HAVE
3062	INDIRECT BSC FAILED
3063	INDIRECT BSC FAILED

* HEADER TEST 2 WAITS. *

B-REG	ERROR WAITS COMMENTS
3064	BSI SKIPPED, SHOULD OF BRANCHED
3065	BSI FAILED TO STORE PROPER I REG
3066	BSI PLUS FELL THROUGH
3067	BSI SKIPPED, SHOULD OF BRANCHED
3068	BSI FAILED TO STORE PROPER I REG
3069	STORE FAILED
306E	SRA 16 FAILED
306F	SRA 15 FAILED
3070	SRA 1 FAILED
3071	SRA 1 FAILED
3072	MULTIPLE SRA'S FAILED
3073	AND OF 0 AND 0 FAILED
3074	AND OF 0 AND 1 FAILED
3075	AND OF 1 AND 0 FAILED
3076	AND OF 1 AND 1 FAILED
3077	OR OF 0 AND 0 FAILED
3078	OR OF 0 AND 1 FAILED
3079	OR OF 1 AND 1 FAILED
307A	ACC DESTROYED AFTER MDX ADD MEM.
307B	ADD TO MEM FAILED

307C RTE ZEROS FROM A TO Q FAILED
307D RTE ONES FROM A TO Q FAILED
307E SRT 32-A REG FAILED
307F SRT 32-Q REG FAILED
3080 SRT 32-A REG FAILED
3081 SRT 32-Q REG FAILED
3082 SRT 15-A REG FAILED
3083 SRT 15-Q REG FAILED
3084 MULTIPLE SRT'S FAILED
3085 MULTIPLE SRT'S FAILED

* HEADER TEST 3 WAITS. *

B-REG	ERROR WAITS COMMENTS
3086	RTE 15-Q TO A FAILED
3087	RTE 15-A TO Q FAILED
3088	MULTIPLE RTE'S FAILED
3089	MULTIPLE RTE'S FAILED
308A	SLA 16-CARRY FAILED
308B	SLA 16-AFFECTED Q RED
308C	SLA 16-CARRY FAILED
308D	SLA 16-AFFECTED Q REG
308E	SLA 1-CARRY FAILED
308F	SRA 1-AFFECTED Q REG
3090	SLA 1-CARRY FAILED
3091	SLA 1-AFFECTED Q REG
3092	MULTIPLE SRA'S & CARRY FAILED
3093	MULTIPLE SRA'S AFFECTED Q REG
3094	SLT 32-CARRY FAILED
3095	SLT 32-Q REG FAILED
3096	SLT 16-CARRY FAILED
3097	SLT 16-Q REG FAILED
3098	SLT 15-CARRY FAILED
3099	SLT 15-Q REG FAILED
309A	MULTIPLE SLT'S & CARRY FAILED
309B	MULTIPLE SLT'S AFFECTED Q REG
309C	STORE ZEROS FAILED
309D	STORE ONES FAILED
309E	STS FAILED TO STORE
309F	LOST ACC DATA AFTER LDS-STS
30A0	STS NOT CLEAR CARRY
30A1	STS NOT CLEAR OVERFLW
30A2	STS FAILED TO STORE
30A3	STS FAILED TO STORE
30A4	STS NOT CLEAR CARRY
30A5	STS FAILED TO STORE
30A6	STS NOT CLEAR OVERFLOW

* HEADER TEST 4 WAITS. *

B-REG	ERROR WAITS COMMENTS
30A7	BSC SKIPPED, SHOULD NOT HAVE
30A8	BSC SKIPPED, SHOULD NOT HAVE
30A9	BSC FAILED TO SKIP
30AA	BSC NOT CLEAR OVERFLW
30AB	BSC FAILED TO SKIP
30AC	BSC FELL THRU
30AD	BSC SKIPPED, SHOULD OF BRANCHED
30AE	ACC DESTROYED AFTER LOAD-TEST-EOR
30AF	BSC FELL THRU
30B0	BSC SKIPPED, SHOULD OF BRANCHED
30B1	BSC SKIPPED, SHOULD NOT OF BRANCHED
30B2	BSC BRANCHED, SHOULD NOT OF BRANCHED
30B3	BSC PLUS CLEARED OVERFLOW
30B4	BSC FAILED TO SKIP
30B5	BSI FELL THRU
30B6	BSI SKIPPED, SHOULD OF BRANCHED
30B7	BSI DID NOT CLEAR OFL
30B8	BSI FELL THROUGH
30B9	BSI SKIPPED, SHOULD OF BRANCHED
30BA	BSI BRANCHED, SHOULD NOT OF BRANCHED
30BB	BSI BRANCHED, SHOULD NOT UF BRANCHED
30BC	BSI BRANCHED, SHOULD NOT OF BRANCHED
30BD	BSI BRANCHED, SHOULD NOT OF BRANCHED
30BE	BSI BRANCHED, SHOULD NOT OF BRANCHED
30BF	BSI BRANCHED, SHOULD NOT OF BRANCHED
30C0	TAG REG BIT 7 FAILED INDEX 1
30C1	TAG REG BIT 6 FAILED INDEX 2
30C2	TAG BIT 6 OR 7 FAILED INDEX 3
30C3	IX 1 NOT LOADED
30C4	IX 2 NOT LOADED
30C5	IX 3 NOT LOADED
30C6	IX 1 NOT LOADED
30C7	IX 2 NOT LOADED
30C8	IX 3 NOT LOADED

* HEADER TEST 5 WAITS. *

B-REG	ERROR WAITS COMMENTS
30C9	LONG FORM LDX-FAILED
30CA	LONG LDX FAILED
30CB	LONG LDX FAILED
30CC	INDIRECT LDX FAILED
30CD	INDIRECT LDX FAILED
30CE	INDIRECT LDX FAILED
30CF	ACC GONE AFTER STX
30D0	IX 1 NOT STORED
30D1	IX 2 NOT STORED
30D2	IX 3 NOT STORED
30D3	IX 1 NOT STORED
30D4	IX 2 NOT STORED
30D5	IX 3 NOT STORED
30D6	IX 1 FAILED TO SKIP
30D7	IX2 CHANGED
30D8	IX3 CHANGED
30D9	IX2 FAILED TO SKIP
30DB	IX3 CHANGED
30DC	IX3 FAILED TO SKIP
30DD	IX1 CHANGED
30DE	IX2 CHANGED
30DF	WRONG DECODE OF ACC
30E0	WRONG DECODE OF ACC
30E1	WRONG DECODE OF ACC
30E2	OVERFLOW IS ON
30E3	CARRY NOT ON OR ADD 0001 + FFFF FAILED
30E4	CARRY NOT ON OR ADD FFFF + FFFF FAILED
30E5	OVERFLOW NOT ON OR ADD 4000 + 4000 FAILED ADD 4000 + 4000 FAILED ADD 8000 + 8000 FAILED
30E6	OVERFLOW NOT ON
30E7	OVERFLOW NOT ON
30E8	CARRY NOT ON

* HEADER TEST 6 WAITS. *

B-REG	ERROR WAITS COMMENTS
30E9	WRONG LOCATION
30EA	IX 1 LOADED WRONG
30EB	WRONG LOCATION
30EC	IX 2 LOADED WRONG
30ED	WRONG LOCATION
30EE	IX 3 LOADED WRONG
30EF	WRONG LOCATION
30F0	IX 3 LOADED WRONG
30F1	WRONG LOCATION
30F2	IX 3-LOADED WRONG
30F3	SHORT INDEX FAILED
30F4	SHORT INDEX FAILED
30F5	SHORT INDEX FAILED
30F6	INDEXED SLA FAILED
30F7	INDEXED SRA FAILED
30F8	INDEXED BSC FAILED
30F9	BSC INDIRECT FAILED
30FA	0001 MINUS 0000 FAIL
30FB	CARRY NOT ON
30FC	FFFF MINUS 0000 FAIL
30FD	CARRY NOT SET
30FE	0001 MINUS 8000 FAIL
30FF	OVERFLOW NOT SET
3100	8000 MINUS 0000 FAIL
3101	CARRY NOT ON
3102	OVERFLOW NOT ON
3103	IX1 FAILED TO SKIP
3104	MDX IX1 FAILED
3105	MDX LONG IX 2 FAILED
3106	IX 3 NO SKIP AT 0
3107	SIGN CHANGE-NO SKIP
3108	ACC GONE AFTER MDX I
3109	INDIRECT MDX FAILED
310A	MDX L FAILED TO SKIP
310B	MDX L SKIPPED-ERROR

* HEADER TEST 7 WAITS. *

B-REG	ERROR WAITS COMMENTS
310C	SLCA 16 FAILED
310D	SLCA 1 FAILED
310E	SLCA 1 FAILED
310F	SLCA 15 FAILED
3110	SLCA 14 FAILED
3111	SLC 1 FAILED
3112	SLC 16 FAILED
3113	SLC 32 FAILED
3114	SLC 31 FAILED
3115	LDD-A REG INCORRECT
3116	LDD-Q REG INCORRECT
3117	LDD-A REG INCORRECT
3118	LDD-Q REG INCORRECT
3119	LDD ODD-A REG FAILED
311A	LDD-ODD-Q REG FAILED
311B	STD ACC INCORRECT
311C	STD Q REG INCORRECT
311D	STD ACC INCORRECT
311E	STD Q REG INCORRECT
311F	STD ODD ACC INCORRECT
3120	STD ODD Q REG STORED INTO WRONG WORD

* COLD START LOADER WAITS. *

* COLD START LOADER PROGRAM WAITS DESCRIPTION.

3200	WAIT 200	THE CE WORD WHICH DEFINES THE DISK PACK AS THE CE PACK WAS NOT FOUND. INSURE THE CE/DIMAL PACK IS LOADED ON THE CORRECT DISK DRIVE. PRESS START TO PROCEED.
3201	WAIT 201	THE DIMAL WORD WHICH DEFINES THE CE DISK PACK AS CONTAINING DIMAL WAS NOT FOUND. INSURE THE PROPER DISK PACK IS LOADED ON THE CORRECT DRIVE. DEPRESS START BUTTON TO PROCEED.
3202	WAIT 202	THE HOME BIT DID NOT

3203	WAIT 203	COME ON AFTER 3 ATTEMPTS TO SEEK HOME. THE DSM IS IN THE A REG. CORRECT THE FAILURE AND IF CORE WAS NOT DISTURBED PRESS RESET AND START. IF CORE WAS DISTURBED, RELOAD THE CALL CARD.
3204	WAIT 204	DISK DRIVE NOT READY. MAKE DISK DRIVE READY. IF THE DISK ARM WAS MOVED, MANUALLY OR BY POWER OFF, PRESS RESET AND START, OTHERWISE JUST PRESS START.
3205	WAIT 205	A DISK ERROR WAS DETECTED ON EACH OF 3 ATTEMPTS TO READ A SECTOR. THE ERROR BITS ARE IN THE A REG. PRESS START TO RETRY THE READ. DEPRESS RESET AND START FOR RESTART OPERA- TION.
3206	WAIT 206	THE WRONG SECTOR ID WAS READ ON EACH OF 3 TRIES. THE Q REG CONTAINS THE EXPECTED SECTOR, AND THE A REG THE ACTUAL SECTOR. PRESS RESET THEN START TO RETRY.

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

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SAMPLE PRINTOUT

1. PURPOSE

THE KEYBOARD PRINTER FUNCTION TEST CHECKS THE OPERATING PERFORMANCE OF THE PRINTER AND KEYBOARD AND AIDS IN THEIR PROPER ADJUSTMENT WHILE BEING RUN IN OVERLAP WITH OTHER SYSTEM FUNCTIONS.

2. PREREQUISITES

THIS PROGRAM MUST RUN UNDER CONTROL OF THE DIAGNOSTIC MONITOR. THE DIAGNOSTIC MONITOR PROGRAM USES 1,500 STORAGE WORDS, AND THIS PROGRAM USES 1,200 STORAGE WORDS.

3. OPERATING PROCEDURE

3.1*** PROGRAM LOADING

STANDARD MONITOR LOADING PROCEDURES APPLY

THESE PROCEDURES ARE SUMMARIZED HERE. SEE DM USE PROCEDURE FOR DETAILS.

1. SET FIRST TYPEWRITER TAB 20 CHARACTERS FROM LEFT MARGIN.
2. SET BIT SWITCH 15 OFF - LOAD AND GO
ON - TO SPECIFY OPTIONS BEFORE RUNNING.

IF HALTED AFTER LOADINGS SELECT PROGRAM OPTIONS THEN TURN OFF HALT SWITCH OR FOLLOW NORMAL RESTART PROCEDURE (SECTION 3.5).

3. LOAD DIAGNOSTIC MONITOR AND KEYBOARD PRINTER TEST.
4. SELECT PROGRAM OPTIONS, IF DESIRED.

3.2*** PROGRAM OPERATION.

STANDARD MONITOR OPERATING PROCEDURES APPLY. THESE PROCEDURES ARE SUMMARIZED HERE. SEE DM USE PROCEDURE FOR DETAILS.

3.2.1 PROGRAM CONTROL - FUNCTION 0

1. SET SWITCHES 0-7 TO 01.
2. SET SWITCHES 8-15 AS DESIRED.

SW	FUNCTION
8	RESTART
9	ROUTINE START MESSAGE
10	LOCK ON FUNCTION
11	LOOP PROGRAM
12	LOOP ON ERROR
13	BYPASS ERROR PRINTOUT
14	HALT ON ERROR
15	HALT

3. PRESS INT REQ KEY ON CONSOLE.

**

3.2.2 ROUTINE SELECTION - FUNCTION 1

THE SELECTED ROUTINE WILL LOOP UNTIL A NEW ROUTINE IS SELECTED.

1. TO SET ROUTINE SELECTION

- A. SET SWITCHES 0-7 TO 41.
- B. SET ROUTINE NUMBER IN SWITCHES 12-15

RTN	DESCRIPTION
1	PRINT LAST KEYBOARD ENTRY
2	TAB AND CARRIER RETURN
3	UPPER CASE CHARACTERS
4	LOWER CASE CHARACTERS
5	REGISTRATION
6	BACKSPACE AND INDEX
7	END OF LINE CARRIER RETURN
8	ROCK
9	TWIST
A	ROLL

- NORMAL ROUTINES-
- THE PROGRAM STARTS WITH
- ROUTINE 1, RUNS EACH
- ROUTINE IN SEQUENCE
- THEN TERMINATES AFTER
- ROUTINE A.

B * PRINT BIT SWITCH IMAGE . OPTIONAL ROUTINES
 . MUST BE SELECTED

* = REFER TO SECTION 3.2.3 FOR SPECIAL INSTRUCTIONS.

C. PRESS INT REQ KEY ON CONSOLE.

2. TO RESET ROUTINE SELECTION SET AS IF SELECTING ROUTINE ZERO.

3.2.3 PRINT FROM BIT SWITCHES

ROUTINE B WILL ALTERNATELY PRINT TWO CHARACTERS SET IN THE BIT SWITCHES. TO SPECIFY THE DESIRED CHARACTERS, SET SWITCH 0-7 AND 8-15 TO THE ROTATE AND TILT CODE FOR THE CHARACTERS.

3.3*** PROGRAM HALTS

3.3.1 NORMAL HALTS

HALT NO. (B REG).	DESCRIPTION	RESTART ACTION
3001	PROGRAM STOP OR ADDRESS STOP	PRESS START
3002	HALT ON ERROR	DISPLAY MODE-PRESS START. RUN MODE-PRESS START

**

3.3.2 ERROR HALTS

HALT NO. (B REG).	DESCRIPTION	RESTART ACTION
30F1	CHECK SUM ERROR ON FIRST CARD OF LOADER	RELOAD
30F2	READER DSW ERROR WHEN LOADING LOADER	RELOAD
30F3	CARD 2 OF LOADER DID NOT LOAD	RELOAD
30F4	CAN NOT CLEAR CORE - DUE TO ERROR IN ADDRESSING UPPER CORE.	
30F5	READER CHECK WHEN LOADING MONITOR OR TEST PROGRAM	NPRO THEN PLACE CARDS RUN OUT IN FRONT OF REMAINING DECK AND PRESS START.
30F6	MONITOR DID NOT LOAD	RELOAD
30F7	CHECK SUM WHEN LOADING MONITOR	RELOAD
30F8	READER NOT READY	MAKE READER READY
30F9	INVALID INTERRUPT WHICH WILL NOT RESET	PRESS RESET AND START
30FA	CONSOLE PRINTER HANG UP - BUSY WILL NOT GO OFF	FIX THE CONSOLE PRINTER OR NOP THIS WAIT

3.4*** PROGRAM TERMINATION

IF LOOP PROGRAM HAS NOT BEEN SPECIFIED THE PROGRAM WILL TERMINATE AT THE END OF ROUTINE 7. ROUTINE 7,A, AND E WILL ONLY RUN SELECTED.

IF ANY ROUTINE IS SELECTED THAT ROUTINE WILL LOOP AND WILL NOT TERMINATE.

3.5*** RESTART

1. SET SWITCHES 0-7 TO 01.
2. TURN ON SWITCH 8.
3. SET DESIRED CONTROL IN SWITCHES 9-14.
4. PRESS INTERRUPT REQUEST KEY.

EO402 000R AAAA XXXX XC00
DSW ERROR IMMEDIATELY AFTER OUTPUT COMMAND.

EO403 000R AAAA XXXX XX00
INTERRUPT DSW ERROR

EO404 000R AAAA XXXX X000
LOST PRINTER INTERRUPT.
DSW AFTER LAST XIO WRITE COMMAND IS PRINTED

EO405 000R AAAA XXXX
KEYCODE ENTRY ERROR. AN ILLEGAL KEYBOARD CODE HAS BEEN DETECTED.
THE KEYBOARD CODE SHOULD HAVE BEEN AN IMAGE OF CARD HOLERITH. COLS
12 - 9 IN BITS 0-11, RESPECTIVELY.

EO406 000R AAAA XXXX X200
DSW ERROR ON PLACING KEYBOARD IN PROCEED STATUS

EO407 000R AAAA XXXX 0000
DSW ERROR AFTER READ KEYBOARD COMMAND

DATE 02JAN66 01MAY66 15NOV66 15JUN67
EC NO. 415490 4154908 419643 420317

PROG ID 0304-*PAGE 0004

5. COMMENTS

THIS FUNCTION TEST CHECKS THE PROPER OPERATION OF THE PRINTER-KEYBOARD STATUS INDICATORS. THE VARIOUS ROUTINES AID IN DETERMINING THE PROPER ADJUSTMENT OF THE PRINTER.

5.1*** THE PRINTER TEST.

THE PRINTER TEST IS A SERIES OF STANDARD TESTS PERFORMED IN ORDER OF COMPLEXITY. EACH TEST HAS TWO LINES OF OUTPUT (THE FIRST IN BLACK AND THE SECOND IN RED). THE ONLY EXCEPTION IS THE REGISTRATION TEST WHICH HAS ONLY ONE LINE.

A. THE NORMALLY RUN ROUTINES ARE DONE SEQUENTIALLY AS FOLLOWS,

1. PRINT LAST KEYBOARD ENTRY.
2. CARRIER RETURN AND TABULATE.
3. UPPER CASE CHARACTERS.
4. LOWER CASE CHARACTERS. (SHIFT SIDE OF ELEMENT).
5. REGISTRATION

THIS TEST PRINTS A BLACK '+' ENCLOSED BY A RED '0'. IT CHECKS THE BACKSPACE FUNCTION AND THE ALIGNMENT OF THE PRINT.

6. BACKSPACE, INDEX.

CHECKS TABULATE, BACKSPACE, AND LINE FEED FUNCTIONS.

7. END OF LINE CARRIER RETURN

CHECKS TO SEE THAT THE END OF LINE CARRIER RETURN WORKS PROPERLY.

8. ROCK

TESTS THE TILT MECHANISM BY TYPING CHARACTERS LOCATED ONE AFTER ANOTHER IN VERTICAL COLUMNS ON THE PRINT HEAD.

9. ROLL

TESTS THE ROTATE MECHANISM BY SELECTING CHARACTERS ONE AFTER ANOTHER IN HORIZONTAL BANDS AROUND THE PRINT HEAD.

A. TWIST

TESTS THE COMBINED ROTATE AND TILT MECHANISM BY CAUSING A MAXIMUM ROTATION AND TILT BETWEEN CHARACTERS.

B. ROUTINES AVAILABLE FOR EXECUTION ON AN OPTIONAL BASIS FOLLOW,

B. PRINT BIT SWITCH IMAGE

THE TWO CHARACTERS IN THE BIT SWITCHES ARE ALTERNATELY PRINTED.

TO ENTER THIS MODE, ROUTINE B MUST BE SPECIFIED (FCM 1).

5.2*** THE KEYBOARD TEST (ROUTINE C)

THE KEYBOARD TEST IS ENTERED BY SWITCHING THE CONSOLE/KEYBOARD SWITCH TO THE KEYBOARD POSITION.

AT THIS TIME THE OPERATOR MAY ENTER ANY NUMBER OF CHARACTERS. EACH CHARACTER ENTERED IS PRINTED AS IT IS KEYED IN. WHEN THE CONSOLE/KEYBOARD SWITCH IS RETURNED TO THE CONSOLE POSITION, THE PROGRAM WILL LOOP ON ROUTINE ONE PRINTING THE FIRST 48 CHARACTERS ENTERED VIA THE KEYBOARD. IF NO ENTRY WAS MADE THEN THE PROGRAM COMPLETES THE PRINTER TEST.

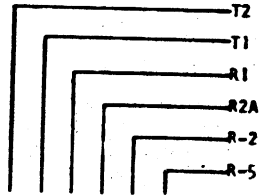
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PROG ID 0304-*PAGE 0004A

6.1 APPENDIX A

PRINTER CHARACTER CODING

LATCH MAGNETS



LOWER CASE						UPPER CASE					
B0	B1	B2	B3	B4	B5	HEXADecimal	B6	HEXADecimal	B7		
0	0	1	1	1	1	A	3C	A	3E	0	
0	0	0	1	1	0	B	18	B	1A	0	
0	0	0	1	1	1	C	1C	C	1E	0	
0	0	1	1	0	0	D	30	D	32	0	
0	0	1	1	0	1	E	34	E	36	0	
0	0	0	1	0	0	F	10	F	12	0	
0	0	0	1	0	1	G	14	G	16	0	
0	0	1	0	0	1	H	24	H	26	0	
0	0	1	0	0	0	I	20	I	22	0	
0	1	1	1	1	1	J	7C	J	7E	0	
0	1	0	1	1	0	K	58	K	5A	0	
0	1	0	1	1	1	L	5C	L	5E	0	
0	1	1	1	0	0	M	70	M	72	0	
0	1	1	1	0	1	N	74	N	76	0	
0	1	0	1	0	0	O	50	O	52	0	
0	1	0	1	0	1	P	54	P	56	0	
0	1	1	0	0	1	Q	64	Q	66	0	
0	1	1	0	0	0	R	60	R	62	0	
1	0	0	1	1	0	S	98	S	9A	0	
1	0	0	1	1	1	T	9C	T	9E	0	
1	0	1	1	0	0	U	80	U	82	0	
1	0	1	1	0	1	V	84	V	86	0	
1	0	0	1	0	0	W	90	W	92	0	
1	0	0	1	0	1	X	94	X	96	0	
1	0	1	0	0	1	Y	A4	Y	A6	0	
1	0	1	0	0	0	Z	A0	Z	A2	0	
1	1	1	1	1	1	1	FC	1	FE	0	
1	1	0	1	1	0	2	DB	+	DA	0	
1	1	0	1	1	1	3	DC	+	DE	0	
1	1	1	1	0	0	4	FD	+	FE	0	
1	1	1	1	0	1	5	F4	+	F6	0	
1	1	0	1	0	0	6	DD	+	D2	0	
1	1	0	1	0	1	7	D4	+	D6	0	
1	1	1	0	0	1	8	E4	+	E6	0	
1	1	1	0	0	0	9	E0	+	E2	0	
1	1	0	0	0	1	0	C4	+	C6	0	
1	1	0	0	0	0	#	CO	+	C2	0	
1	0	1	1	1	1	/	BC	+	BE	0	
1	0	0	0	0	1	-	84	+	86	0	
1	0	0	0	0	0	.	80	+	82	0	
0	1	0	0	0	1	!	44	+	46	0	
0	1	0	0	0	0	@	40	+	42	0	
0	0	0	0	0	1	~	04	+	06	0	
0	0	0	0	0	0	.	00	+	02	0	

TILT/ROTATE TABLE FOR PRINT ELEMENT 969

ROTATE -		+ ROTATE								
5	4	3	2	1	0	1	2	3	4	5
0)	<	[*	'	!	+	-	~	"
1	_	T	V	X	Y	Z	S	U	W	Z
2	J	L	N	P	Q	R	K	M	O	R
3	A	C	E	G	H	I	%	B	D	F

UPPER CASE

ROTATE -		+ ROTATE								
5	4	3	2	1	0	1	2	3	4	5
0	1	3	5	7	8	0	2	4	6	9
1	/	T	V	X	Y	-	S	U	W	Z
2	J	L	N	P	Q	~	K	M	O	R
3	A	C	E	G	H	@	B	D	F	I

LOWER CASE

35 BB

700 EC NO.

Note: Some level missing


```

*           THE INTERRUPT REQUEST KEY          30401380
*           WHILE THE CONSOLE SW WAS          30401390
*           IN THE KEYBOARD POSITION           30401400
*                                           30401410
0603 0 18C1  KBD2  RTE      1          30401420
0604 1 4C10 060A BSC  L  KBD2,-  BR IF DSW OK 30401430
0606 0 18D1   RTE      17          30401440
0607 0 C035   LD      DSWIT          30401450
0608 0 E039   AND     KBE00          30401460
0609 0 702C   MDX     KEYER          30401470
*                                           30401480
*                                           30401490
060A 0 C031  KBD2  LD      KA000      SELECT KEYBOARD NEXT 30401500
060B 0 D302   STO     3 STS          30401510
060C 0 0B10   XIO     3 SEE          DESELECT KEYBOARD 30401520
*                                           30401530
*                                           30401540
060D 0 C033   LD      TWLVE          30401550
060E 0 D301   STO     3 RTN          SET RTN NUMBER 30401560
*                                           30401570
*                                           30401580
060F 0 63E7   LDX     3 -25          INITIALIZE KEYBOARD 30401590
0610 1 6F00 07AC STX  L3 WRDCT&1  INPUT TABLE 30401600
0612 0 6300   LDX     3 0          30401610
0613 1 6F00 07CA STX  L3 SLTWD          30401620
0615 1 6F00 085C STX  L3 ANY&3          30401630
0617 0 1010   SLA     16          30401640
0618 1 D400 0640 STO  L  ERIND          30401650
061A 0 6301   LDX     3 1          30401660
061B 1 6F00 085B STX  L3 ANY&2          30401670
*                                           30401680
*                                           30401690
061D 0 701B   MDX     COMIX          EXIT 30401700
*                                           30401710
*                                           30401720
061E 0 D302  TYPSTV STO  3 STS          RESTORE PTR STS 30401730
061F 0 C01D   LD      DSWIT          CHECK TYPR RESP DSW 30401740
0620 1 E400 0773 AND  L  KEFFF          30401750
0622 0 F01B   EOR     K8000          30401760
0623 1 4C18 0639 BSC  L  COMIX,&-  BR IF DSW OK 30401770
0625 0 C017   LD      DSWIT          SAVE TYPR RESP DSW ERR 30401780
0626 1 E400 0774 AND  L  KCNSL          30401790
0628 0 E815   OR      K8000          30401800
0629 0 700C   MDX     KEYER          30401810
*                                           30401820
*                                           30401830
062A 0 C014  KBD2  LD      KC000      READ KEYBOARD NEXT 30401840
062B 0 D302   STO     3 STS          30401850
062C 0 C010   LD      DSWIT          CHECK KEYBOARD RESP 30401860
062D 0 F00D   EOR     K4200          DSW 30401870
062E 1 E400 0773 AND  L  KEFFF          30401880
0630 1 4C18 0639 BSC  L  COMIX,&-  BR IF DSW OK 30401890
0632 0 C00A   LD      DSWIT          SAVE KBD RESP DSW ERR 30401900
0633 1 E400 0774 AND  L  KCNSL          30401910
0635 0 E805   OR      K4200          30401920
0636 0 18D0  KEYER RTE      16          30401930
*                                           30401940
*                                           30401950
0637 0 DB12   STD     3 ERR          SAVE DSW ERROR 30401960
0638 0 6B07   STX     3 ERIND          SET ERROR INDICATOR 30401970
*                                           30401980
*                                           30401990
0639 1 4C80 05E7 COMIX BSC  I  COMIN          BUG - OUT OF INTRPT 30402000
*                                           30402010
*                                           30402020
063B 0 4200  K4200 DC      /4200          CONSTANTS 30402030
063C 0 A000  KA000 DC      /A000          30402040
063D 0 0000  DSWIT DC      /0000          INTRPT DSW STORAGE 30402050
063E 0 8000  K8000 DC      /8000          PTR SVC INT DSW S/B 30402060
063F 0 C000  KC000 DC      /C000          30402070
0640 0 0000  ERIND DC      /0000          ERROR INDICATOR 30402080
0641 0 000C  TWLVE DC      12          30402090
0642 0 BE00  KBE00 DC      /BE00          30402100
*****
*
*****

```

```

0643 0 4480 0160 TYCUS BSI  I  BEGIN          * SC 30402060
0645 1 05DC   DC      PID          * 30402070
*****
*
*****
*
*           INITIAL PROGRAM ENTRY          *
*           POINT                          *
*                                           *
*****
*
0646 1 6C00 0A81 GO  STX  L0 FIRST          SET TO PRINT SW STS 30402170
0648 1 6C00 0A2A STX  L0 PTR0&STS        30402180
064A 0 1010   SLA     16          RESET LOOP RTN 1 30402190
064B 1 D400 085C STO  L  ANY&3          30402200
064D 1 D400 0640 STO  L  ERIND          30402210
064F 1 D400 05DD STO  L  RID          30402220
0651 1 C400 05E0 LD  L  SW1          30402230
0653 0 18C1   RTE     1          30402240
0654 0 4820   BSC     Z          30402250
0655 0 1081   SLT     1          30402260
0656 1 D400 05E0 STO  L  SW1          30402270
*                                           30402280
*                                           30402290
0658 0 6500 FFFF LDX  L1 -1          TERMINATE KBD INPUT 30402300
065A 1 6D00 085B STX  L1 ANY&2          30402310
*                                           30402320
*                                           30402330
065C 1 6700 0A28 GO3 LDX  L3 PTR0          INTR PTR STATUS TABL 30402340
065E 1 C400 0859 LD  L  ANY          30402350
0660 0 D304   STO     3 ITR          30402360
0661 0 D305   STO     3 SLT          30402370
0662 0 1801   SRA     1          30402380
0663 0 D306   STO     3 NOS          30402390
0664 0 D307   STO     3 PAD          30402400
*                                           30402410
*                                           30402420
0665 0 63E7   LDX     3 -25          INITIALIZE KEYBOARD 30402430
0666 1 6F00 07AC STX  L3 WRDCT&1  INPUT TABLE 30402440
0668 0 6300   LDX     3 0          30402450
0669 1 6F00 07CA STX  L3 SLTWD          30402460
066B 0 7000   MDX     PRCON          30402470
*****
*****
*
*           ROUTINE CONTROLLER            30402480
*
*           THIS ROUTINE CONTROLS THE     30402490
*           EXECUTION OF ALL PRINTER     30402500
*           AND KEYBOARD ROUTINES.       30402510
*                                           30402520
*                                           30402530
*           IF THIS ROUTINE TIMES OUT    30402540
*           WHEN WAITING FOR AN          30402550
*           INTERRUPT FROM THE PRINTER   30402560
*           AN ERROR WILL BE PRINTED.    30402570
*                                           30402580
*           THE SEQUENCING OF ROUTINES   30402590
*           IS CONTROLLED BY THE MARK    30402600
*           ROUTINE WHICH BUILDS THE     30402610
*           CHARACTERS TO BE PRINTED.    30402620
*                                           30402630
*                                           30402640
066C 0 C0D3  PRCON LD      ERIND          30402650
066D 1 4C20 075F BSC  L  INERR,Z  BR IF ERROR INDICATD 30402660
*                                           30402670
*                                           30402680
066F 1 C400 05DD LD  L  RID          FETCH ROUTINE NUMBER 30402690
0671 0 90CF   S      TWLVE          30402700
0672 1 4418 0A3F BSI  L  SWSET,&-  CHECK SWS IF KBD RTN 30402710
*                                           30402720
*                                           30402730
0674 1 6700 0A28 LDX  L3 PTR0          FETCH PRINTER STATUS 30402740
0676 0 C302   LD      3 STS          30402750
0677 0 D025   STO     RESTO          SAVE IT 30402760

```

```
0678 1 4C10 068D      BSC L EXEC3,- BR IF PTR SVC RQSTD
*
*
*           WHEN STS IS,
*
*           ZERO-POS GO SERVICE PTR
*           NEGATIVE,
*           A000 SELECT KBD
*           C000 READ KBD NEXT
*           FC00-FFFF COUNT FOR INT
*           FFFF LOST INT ERR
*           E000 WAIT TYPWR INT
*           F000 WAIT KBD INT
*           8000 IGNORE
*
067A 0 1001          SLA 1
067B 1 4C18 0876     BSC L TYEND,&- BR IF END PROGRAM
067D 0 180C          SRA 12
067E 1 4C04 0688     BSC L SVC,E BR IF WAIT KBD INT
0680 0 1802          SRA 2
0681 0 901D          S K0001
0682 1 4C18 0781     BSC L SELC2,&- BR IF SELECT KBD
0684 0 901A          S K0001
0685 1 4C18 07A3     BSC L KEYBD,&- BR IF READ KEYBD
0687 0 700E          MDX EXEC9 IGNORE OR WAIT
*
0688 1 7401 0A2A     SVC MDX L PTR0&STS,1 COUNT DOWN FOR INT
068A 0 700B          MDX EXEC9 WAIT FOR INTRPT
068B 1 4C00 0775     BSC L NOIN PRINT NO INTRPT ERROR
*
068D 1 4400 0A3F     EXEC3 BSI L SWSET CK CON/KBD SW SETTING
068F 0 C00E          LD KF800 SERVICE PRINTER
0690 0 D302          STO 3 STS UPDATE PTR STATUS
0691 1 4C00 0736     BSC L READY
*
0693 0 C009          EXEC7 LD RESTO RESTORE TO TRY LATER
0694 1 D400 0A2A     STO L PTR0&STS
0696 1 6500 066C     EXEC9 LDX L1 PRCON TRY AGAIN - LATER
0698 1 6D00 05E5     STX L1 MLSCF
069A 0 4480 0161     BSI I START
*
069C 0 0001          I DC 1
069D 0 0000          RESTO DC /0000
069E 0 F800          KF800 DC /F800
069F 0 0001          K0001 DC /0001 CONSTANT
*
*****
*
*           THIS ROUTINE BUILDS THE
*           NEXT CHARACTER TO BE
*           PRINTED. THE CHARACTER
*           IS FETCHED FROM THE
*           PROPER ROUTINE TABLE OR
*           IS TAKEN FROM THE BIT SWS.
*
*           A ROUTINE WHICH IS RUNNING
*           WILL NOT TERMINATE UNTIL
*           IT HAS BEEN COMPLETED.
*
06A0 1 C400 05E0     MARK LD L SW1
06A2 0 100C          SLA 12
06A3 0 180C          SRA 12
06A4 1 9400 084D     S L ELVEN IS TYPE SWS ROUTINE
06A6 1 4C20 06E3     BSC L MARKG,Z BR IF NO
*
06A8 1 C400 084D     LD L ELVEN SET ROUTINE ID
```

30402740
30402750
30402760
30402770
30402780
30402790
30402800
30402810
30402820
30402830
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30402850
30402860
30402870
30402880
30402890
30402900
30402910
30402920
30402930
30402940
30402950
30402960
30402970
30402980
30402990
30403000
30403010
30403020
30403030
30403040
30403050
30403060
30403070
30403080
30403090
30403100
30403110
30403120
30403130
30403140
30403150
30403160
30403170
30403180
30403190
30403200
30403210
30403220
30403230
30403240
30403250
30403260
30403270
30403280
30403290
30403300
30403310
30403320
30403330
30403340
30403350
30403360
30403370
30403380
30403390
30403400
30403410

```
06AA 1 D400 05DD     STO L RID
06AC 0 6809          STX 3 MARKU&1 SAVE IX
06AD 0 C006          LD MARKT SET MLSCF
06AE 1 D400 05E5     STO L MLSCF *
06B0 0 6C00 0165     STX L RTNSW SET RTN SW
06B2 0 4480 0161     BSI I START GO TO START
06B4 1 06B5          MARKT DC MARKU
06B5 0 6700 0000     MARKU LDX L3 0 RESTORE IX
*
06B7 1 0C00 0A3C     XIO L RDBS READ BIT SWITCHES
06B9 1 C400 0A3E     LD L BITSW
06BB 0 6500 0000     MARK1 LDX L1 /0000 FETCH SHIFT COUNT
06BD 0 1100          SLA 1 0
06BE 0 1808          SRA 8
06BF 0 F0DC          EOR I
06C0 0 4820          BSC Z SKIP IF ILLEGAL CODE
06C1 0 F0DA          EOR I
06C2 0 1008          SLA 8
06C3 0 D303          STO 3 OUT
06C4 0 C0F7          LD MARK1&1 RESET SHIFT COUNT
06C5 0 4830          BSC -Z
06C6 0 6100          LDX 1 0
06C7 0 4808          BSC &
06C8 0 6108          LDX 1 8
06C9 0 69F2          STX 1 MARK1&1
06CA 0 70CB          MDX EXEC9
*
*
06CB 1 4C00 0876     MARK2 BSC L TYEND END PROGRAM
*
06CD 0 7201          MARK3 MDX 2 1
06CE 1 6E00 0A29     MARK4 STX L2 PTR0&RTN
06D0 1 D400 05DD     STO L RID SAVE THE ROUTINE NO
*
06D2 1 6E80 06E6     STX 12 MARKL&1
*
06D4 1 C680 084D     LD 12 FUNR-1
06D6 0 D304          STO 3 ITR FETCH ADRS OF TEST
*
06D7 0 1810          SRA 16 RESTORE WORDS PT
06D8 0 D307          STO 3 PAD
*
06D9 1 C600 084D     MARK5 LD L2 FUNR-1 RESTORE TEST PT
06DB 1 4C28 06CB     BSC L MARK2,Z& BR IF PTR FINISHED
*
06DD 0 8307          A 3 PAD
06DE 0 D300          STO 3 ADR
*
06DF 0 1810          SRA 16 RESTORE WORDS PRTD
06E0 0 D306          STO 3 NOS
*
06E1 0 C0BA          LD I RESTORE SHIFT WORD
06E2 0 D305          STO 3 SLT
*
06E3 1 6580 0A28     MARKG LDX 11 PTR0&ADR
06E5 1 6680 0A29     MARKL LDX 12 PTR0&RTN
06E7 0 6916          STX 1 MARKP&1 SAVE IXING
06E8 0 6A17          STX 2 MARKQ&1 *
06E9 0 6B18          STX 3 MARKR&1 *
06EA 1 C400 0A29     LD L PTR0&RTN GET RTN
06EC 1 F400 05DD     EOR L RID HAS IT CHANGED
06EE 1 4C18 06FD     BSC L MARKP,&- NO
06F0 1 C400 0A29     LD L PTR0&RTN SET RTN
06F2 1 D400 05DD     STO L RID *
06F4 0 6C00 0165     STX L RTNSW SET SWITCH
06F6 1 C400 06FC     LD L MARKZ SET MLSCF
06F8 1 D400 05E5     STO L MLSCF *
06FA 0 4480 0161     BSI I START GO TO START
```

30403420
30403430
30403440
30403450
30403460
30403470
30403480
30403490
30403500
30403510
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30403530
30403540
30403550
30403560
30403570
30403580
30403590
30403600
30403610
30403620
30403630
30403640
30403650
30403660
30403670
30403680
30403690
30403700
30403710
30403720
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30403760
30403770
30403780
30403790
30403800
30403810
30403820
30403830
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30403850
30403860
30403870
30403880
30403890
30403900
30403910
30403920
30403930
30403940
30403950
30403960
30403970
30403980
30403990
30404000
30404010
30404020
30404030
30404040
30404050
30404060
30404070
30404080
30404090

1131 KEYBOARD-PRINTER TEST

```

06FC 1 06FD      MARKZ DC      MARKP
06FD 0 6500 0000 MARKP LDX L1 0      RESTORE IXING
06FF 0 6600 0000 MARKQ LDX L2 0      *
0701 0 6700 0000 MARKR LDX L3 0      *
*
0703 0 C305      LD      3 SLT      BUMP SFF WT BY ONE
0704 0 8097      A      I
0705 0 D305      STO     3 SLT
*
0706 1 4C04 070A BSC L MARKS,E      SHIFT IF ODD
0708 0 C101      LD      1 1      FETCH OUTPUT WORD
0709 0 7008      MDX     MARKN
*
070A 0 C306      MARKS LD      3 NOS      BUMP WORDS BY ONE
070B 0 8090      A      I
070C 0 D306      STO     3 NOS
*
070D 0 7101      MDX     1 1
070E 1 6D80 06E4 STX L1 MARKG&1
0710 0 C100      LD      1 0      FETCH OUTPUT CHAR
0711 0 1008      SLA     8      SHIFT IT
*
0712 0 D303      MARKN STO 3 OUT      SAVE NEXT OUTPUT WD
*
0713 0 F05C      EOR     KFF00
0714 1 4C20 0696 BSC L EXEC9,Z      BR IF NOT END OF FCN
*
0716 0 C304      LD      3 ITR      DECREMENT ITCNT
0717 1 9400 069C S      L I
0719 0 D304      STO     3 ITR
071A 1 4C20 06D9 BSC L MARK5,Z      BR IF NO DO AGAIN
*
071C 0 C306      LD      3 NOS      UPDATE MODIFIER WORD
071D 1 8400 069C A      L I
071F 0 D306      STO     3 NOS
0720 0 8307      A      3 PAD
0721 0 D307      STO     3 PAD
*
0722 0 C101      LD      1 1      FETCH NEXT REPEAT CT
0723 0 D304      STO     3 ITR
0724 1 F400 05E6 EOR L TERM
0726 1 4C20 06D9 BSC L MARK5,Z      BR IF NOT END OF RTN
0728 1 C400 05E0 LD L SW1
072A 0 E00A      AND     BASIC      ASSURE PROPER ENTRY
072B 1 4C18 06CD BSC L MARK3,&-      BR IF NO RTN SELECT
*
072D 0 D004      STO     MARKE&1
072E 0 9005      S      ALL
072F 1 4C30 06CD BSC L MARK3,-Z      BR IF RTN TOO LARGE
0731 0 6600 0001 MARKE LDX L2 1
0733 0 709A      MDX     MARK4
*
*****
*
0734 0 000A      ALL DC      FUND-FUNR ALL TYPEWRITER RTNS
0735 0 000F      BASIC DC   /000F
*****
*
* THIS ROUTINE CHECKS IF THE
* PRINTER CAN BE USED AND
* IF THE PRINTER IS READY.
*
* WHEN LOGBY INDICATES THAT
* THE PRINTER IS LOGICALLY

```

```

30404100
30404110
30404120
30404130
30404140
30404150
30404160
30404170
30404180
30404190
30404200
30404210
30404220
30404230
30404240
30404250
30404260
30404270
30404280
30404290
30404300
30404310
30404320
30404330
30404340
30404350
30404360
30404370
30404380
30404390
30404400
30404410
30404420
30404430
30404440
30404450
30404460
30404470
30404480
30404490
30404500
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30404570
30404580
30404590
30404600
30404610
30404620
30404630
30404640
30404650
30404660
30404670
30404680
30404690
30404700
30404710
30404720
30404730
30404740
30404750
30404760
30404770

```

1131 KEYBOARD-PRINTER TEST

```

*
* NOT BUSY, THE DSW IS
* CHECKED FOR READY.
*
0736 0 C480 0167 READY LD I LOGBY
0738 1 4C20 074C BSC L RDY2,Z      BR IF NO TYPE NOW
*
073A 1 6500 05E7 LDX L1 COMIN      SET INT VECTOR
073C 0 6D00 018B STX L1 RQTY
073E 1 6700 0A28 LDX L3 PTR0
0740 0 10A0      SLT     32
*
0741 0 0B0A      XIO     3 PTR      SENSE - RESET DSW
0742 0 D02C      STO     DSWAS
0743 0 E02F      AND     KEFFF
0744 1 4C18 0750 BSC L TYPIT,&-      BR IF DSW OK
0746 0 C828      LDD     DSWAS
0747 0 E02C      AND     KCNSL
0748 0 18D0      RTE     16
*
0749 0 6101      LDX     1 1      ERROR - NOT READY
074A 1 4400 0833 BSI L PRDSW      PRINT THE ERROR MSG
074C 1 6500 0736 RDY2 LDX L1 READY
074E 1 4C00 0840 BSC L PDSWX
*
* PRINT ONE CHARACTER
*
* THIS ROUTINE PRINTS ONE
* CHARACTER ON THE CONSOLE
* PRINTER AND THEN CHECKS
* IF THE PRINTER BECAME
* BUSY-NOT READY BY THE
* OUTPUT COMMAND.
*
0750 0 0B08      TYPIT XIO 3 WRT      PRINT CHARACTER
0751 0 0B0A      XIO     3 PTR      SENSE - RESET DSW
0752 0 D01A      STO     DSWBY
*
* CHECK BUSY DSW
*
0753 0 E01F      AND     KEFFF
0754 0 F019      EOR     KOC00
0755 1 4C18 06A0 BSYOK BSC L MARK,&-      BR IF DSW OK
*
0757 0 C815      LDD     DSWBY
0758 0 E01B      AND     KCNSL
0759 0 E814      OR      KOC00
075A 0 18D0      RTE     16
075B 0 6102      LDX     1 2
075C 1 4400 0833 BSI L PRDSW      PRINT THE ERROR MSG
075E 0 70F6      MDX     BSYOK
*****
*
* PRINT INTERRUPT DSW ERROR
*
075F 0 10A0      INERR SLT 32      RESET ERROR IND
0760 1 D400 0640 STO L ERIND
*
0762 1 CC00 0A3A LDD L ERR&PTR0      FETCH THE ERROR MESG
0764 0 6103      LDX     1 3      SET MSG ID - 3
0765 1 4400 0833 BSI L PRDSW      PRINT THE ERROR MSG
0767 0 10A0      SLT     32
0768 0 DB12      STD     3 ERR      RESET ERROR IND
0769 1 4C00 066C BSC L PRCON      RETURN TO MAIN LINE
*****
*
*
076C 0 0001      BSS E 1
076D 0 0000      DSWBY DC /0000      LAST BUSY DSW
076E 0 0C00      KOC00 DC /0C00      BUSY DSW S/B

```

```

30404780
30404790
30404800
30404810
30404820
30404830
30404840
30404850
30404860
30404870
30404880
30404890
30404900
30404910
30404920
30404930
30404940
30404950
30404960
30404970
30404980
30404990
30405000
30405010
30405020
30405030
30405040
30405050
30405060
30405070
30405080
30405090
30405100
30405110
30405120
30405130
30405140
30405150
30405160
30405170
30405180
30405190
30405200
30405210
30405220
30405230
30405240
30405250
30405260
30405270
30405280
30405290
30405300
30405310
30405320
30405330
30405340
30405350
30405360
30405370
30405380
30405390
30405400
30405410
30405420
30405430
30405440
30405450

```

```

076F 0 0000 DSWAS DC /0000 LAST READY DSW 30405460
0770 0 FF00 KFF00 DC /FF00 CONSTANT 30405470
0771 0 0000 DSWBS DC /0000 30405480
0772 0 0200 F0200 DC /0200 30405490
0773 0 EFFF KEFFF DC /EFFF MASK CONSOLE SW 30405500
0774 0 1000 KCNSL DC /1000 30405510
*****
*
*
* PRINT NO INTERRUPT ERROR 30405520
* 30405530
* 30405540
* 30405550
* 30405560
0775 0 0B0A NOIN XIO 3 PTR SENSE - RESET DSW 30405570
0776 0 D0FA STO DSWBS 30405580
0777 0 C8F9 LDD DSWBS 30405590
0778 0 E0FB AND KCNSL 30405600
0779 1 EC00 063E OR L K8000 30405610
077B 0 18D0 RTE 16 30405620
077C 0 6104 LDX 1 4 ERROR - 4 30405630
077D 1 4400 0833 BSI L PRDSW PRINT THE ERROR MSG 30405640
077E 1 4C00 066C BSC L PRCON 30405650
*****
*
* KEYBOARD TEST 30405660
* 30405670
* 30405680
* 30405690
* 30405700
* 30405710
* 30405720
0781 1 6600 05E7 SELC2 LDX L2 COMIN RESET INT XFR VECTOR 30405730
0783 0 6E00 01BC STX L2 RQKB FOR KEYBOARD REQ 30405740
0785 0 6E00 01BD STX L2 SVKB AND SVC KEYBOARD 30405750
* 30405760
0787 0 0B0A XIO 3 PTR SENSE AND SAVE DSW 30405770
0788 0 D0E6 STO DSWAS 30405780
* 30405790
0789 0 C045 LD KF000 RESET PTR STATUS 30405800
078A 0 D302 STO 3 STS 30405810
078B 0 C8E3 LDD DSWAS 30405820
078C 0 E0E6 AND KEFFF 30405830
078D 1 4C18 0793 BSC L SELC,&- BR IF DSW OK 30405840
078F 0 C0DF LD DSWAS 30405850
0790 0 E0E3 AND KCNSL 30405860
0791 0 6101 LDX 1 1 ERROR - 1 30405870
0792 0 700B MDX SELC1 PRINT DSW ERROR 30405880
* 30405890
0793 0 0B0E SELC XIO 3 KEY SELECT KEYBOARD 30405900
0794 0 0B0A XIO 3 PTR SENSE - RESET DSW 30405910
0795 0 D0DB STO DSWBS 30405920
0796 0 F0DB EOR F0200 30405930
0797 0 E0DB AND KEFFF 30405940
0798 1 4C18 066C BSC L PRCON,&- BR IF DSW OK 30405950
* 30405960
079A 0 C8D6 LDD DSWBS PRINT DSW ERROR 30405970
079B 0 E0D8 AND KCNSL 30405980
079C 0 E8D5 OR F0200 30405990
079D 0 6106 LDX 1 6 ERROR - 6 30406000
* 30406010
079E 0 18D0 SELC1 RTE 16 30406020
079F 1 4400 0833 BSI L PRDSW PRINT THE ERROR MSG 30406030
07A1 1 6400 0693 LDX L EXEC7 TRY AGAIN - LATER 30406040
*****
*
* DECODE CHARACTER KEYED IN 30406050
* 30406060
* 30406070
* 30406080
* 30406090
07A3 0 0B10 KEYBD XIO 3 SEE READ AND SAVE CHAR 30406100
07A4 0 0B0A XIO 3 PTR SENSE - RESET DSW 30406110
07A5 0 10A0 SLT 32 30406120
07A6 1 4C18 07AB BSC L WRDCT,&- 30406130

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07A8 0 6107 LDX 1 7 ERROR - 7 30406140
07A9 1 4400 0833 BSI L PRDSW PRINT DSW ERROR - 7 30406150
* 30406160
07AB 0 6600 0000 WRDCT LDX L2 /0000 30406170
07AD 0 61BF LDX 1 -65 30406180
07AE 1 C500 08B9 CNVRT LD L1 KECOD&65 LOOK UP CHAR IN TABLE 30406190
07B0 0 F30E EOR 3 KEY 30406200
07B1 1 4C18 07D0 BSC L CMPRE,&- BR IF CHAR MATCHES 30406210
07B3 0 7101 MDX 1 1 30406220
07B4 0 70F9 MDX CNVRT 30406230
* 30406240
07B5 0 C30E LD 3 KEY 30406250
07B6 0 F011 EOR NCAP 30406260
07B7 1 4C18 07C5 BSC L NOCP,&- BR IF NO CAP NEXT 30406270
* 30406280
07B9 0 C00F LD ERS LC 30406290
07BA 0 F30E EOR 3 KEY 30406300
07BB 1 4C18 07F9 BSC L ERSE,&- BR IF ERASE LAST CHR 30406310
* 30406320
07BD 0 6201 LDX 2 1 SET MODIFIER WORD COUNT 30406330
07BE 1 6E00 0847 STX L2 EMESG&2 30406340
* 30406350
07C0 0 6105 LDX 1 5 ERROR 5 30406360
07C1 0 C30E LD 3 KEY KB READ ERROR WORD 30406370
07C2 1 4400 0833 BSI L PRDSW PRINT THE ERROR MSG 30406380
07C4 0 70BC MDX SELC2 30406390
* 30406400
07C5 0 6801 NOCP STX 0 LOWER 30406410
07C6 0 70BA MDX SELC2 30406420
*****
* 30406430
* 30406440
* 30406450
07C7 0 0000 LOWER DC /0000 # 0 IF NEXT UPR CASE 30406460
07C8 0 0002 NCAP DC /0002 ERASE FIELD KEY CODE 30406470
07C9 0 0004 ERS LC DC /0004 BACKSPACE KEY CODE 30406480
07CA 0 0000 SLTWD DC /0000 KEYBOARD SHIFT WORD 30406490
07CB 0 FFE7 KFFE7 DC -25 30406500
07CC 0 0000 ERSEA DC /0000 30406510
07CD 0 1111 BSPSE DC /1111 BACK SPACE 30406520
07CE 0 0008 KO008 DC /0008 30406530
07CF 0 F000 KF000 DC /F000 30406540
*****
* 30406550
* 30406560
* 30406570
* 30406580
* 30406590
07D0 1 C500 08FA CMPRE LD L1 TYCOD&65 FETCH PRINTER CHAR 30406600
07D2 1 7400 07C7 MDX L LOWER,0 SKIP IF UPPER CASE 30406610
07D4 0 1808 SRA 8 30406620
07D5 0 1008 SLA 8 30406630
07D6 0 D303 STO 3 OUT SAVE OUTPUT CHAR 30406640
* 30406650
07D7 0 6100 LDX 1 0 RESET LOWER CASE SW 30406660
07D8 0 69EE STX 1 LOWER 30406670
* 30406680
07D9 1 7400 07CA MDX L SLTWD,0 BR IF CHAR IS FIRST 30406690
07DB 0 7004 MDX SFT * TO BE PLACED IN WD 30406700
* 30406710
07DC 0 6121 LDX 1 /21 30406720
07DD 0 7201 MDX 2 1 SKIP IF TABLE COMPLT 30406730
07DE 0 7006 MDX TBLIS 30406740
07DF 0 7009 MDX EXIT 30406750
* 30406760
07E0 0 6100 SFT LDX 1 0 30406770
07E1 0 1808 SRA 8 30406780
07E2 0 7000 MDX TBLIZ 30406790
* 30406800
07E3 1 EE00 0874 TBLIZ OR L2 ANY&2 PLACE CHAR IN OUTPUT 30406810

```

1131 KEYBOARD-PRINTER TEST

```

07E5 1 D600 0874  TBLIS STO L2 ANY&27 * TABLE 30406820
* 30406830
07E7 0 69E2  TBLI STX 1 SLTWD SAVE TEST STATUS 30406840
07E8 0 6AC3  STX 2 WRDCT&1 30406850
07E9 1 C400 0844  EXIT LD L KE000 30406860
07EB 0 D302  STO 3 STS UPDATE PRTR STATUS 30406870
07EC 1 6500 07E9  LDX L1 EXIT 30406880
07EE 0 C480 0167  LD 1 LOGBY 30406890
07F0 1 4C20 0840  BSC L PDSWX,Z 30406900
07F2 1 6500 05E7  LDX L1 COMIN 30406910
07F4 0 6D00 018B  STX L1 RQTY 30406920
07F6 0 0808  XID 3 WRT PRINT ONE CHARACTER 30406930
07F7 1 4C00 066C  BSC L PRCON CONTINUE TILL INTRPT 30406940
***** 30406950
* 30406960
* ERASE LAST CHARACTER 30406970
* KEYED IN 30406980
* 30406990
07F9 0 6AD2  ERSE STX 2 ERSEA 30407000
07FA 0 C0D1  LD ERSEA 30407010
07FB 0 F0CF  EOR KFFE7 30407020
07FC 1 4C18 0781  BSC L SELC2,&- BR IF TABLE EMPTY 30407030
* 30407040
* LD SLTWD 30407050
07FE 0 C0CB  BSC L ERSE1,Z BR IF NOT SHIFTED 30407060
07FF 1 4C20 0809  LDX 1 /0021 ERASE SHIFTED CHAR 30407070
0801 0 6121  LD L2 ANY&27 30407080
0802 1 C600 0874  SRA 8 30407090
0804 0 1808  SLA 8 30407100
0805 0 1008  STO L2 ANY&27 30407110
0806 1 D600 0874  MDX ERSE2 30407120
0808 0 7006  * 30407130
* 30407140
0809 0 1010  ERSE1 SLA 16 30407150
080A 0 6100  LDX 1 0 30407160
080B 0 72FF  MDX 2 -1 30407170
080C 0 1000  NOP 30407180
080D 1 D600 0875  STO L2 ANY&28 30407190
080F 0 C0BD  ERSE2 LD BSPSE SET BACKSPACE CODE 30407200
0810 0 D303  STO 3 OUT * IN OUTPUT WORD 30407210
0811 0 70D5  MDX TBLI 30407220
***** 30407230
* 30407240
* TERMINATE MESSAGE ROUTINE 30407250
* 30407260
0812 0 0000  ENDM DC /0000 30407270
0813 0 C048  LD ANY&3 30407280
0814 1 6680 07AC  LDX I2 WRDCT&1 30407290
0816 1 4C18 0829  BSC L ENDM2,&- BR IF TABLE EMPTY 30407300
0818 0 6102  LDX 1 2 30407310
0819 0 6941  STX 1 ANY&2 30407320
081A 0 C0AF  LD SLTWD 30407330
081B 1 4C18 0821  BSC L ENDM1,&- BR IF LAST SHIFTED 30407340
081D 1 EE00 0874  OR L2 ANY&27 30407350
081F 1 D600 0874  STO L2 ANY&27 30407360
* 30407370
0821 1 C400 0909  ENDM1 LD L RED1 SET TABLE TERMINATOR 30407380
0823 1 D600 0875  STO L2 ANY&28 30407390
0825 0 C032  LD FUND 30407400
0826 1 D600 0876  STO L2 ANY&29 30407410
0828 0 7002  MDX ENDM3 30407420
* 30407430
0829 0 C02E  ENDM2 LD FUND SET TABLE TERMINATOR 30407440
082A 0 D030  STO ANY&2 30407450
* 30407460
082B 0 C0A2  ENDM3 LD K0008 RESTORE PTR RTN 30407470
082C 1 D400 0A2A  STO L STS&PTR0 30407480
* 30407490
082E 0 6200  LDX 2 0 30407490

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1131 KEYBOARD-PRINTER TEST

```

082F 1 6E00 05E0  STX L2 SW1 30407500
* 30407510
0831 1 4C80 0812  BSC I ENDM RETURN TO USER 30407520
***** 30407530
* 30407540
* PRINT ERROR ROUTINE 30407550
* 30407560
0833 0 0000  PRDSW DC /0000 30407570
0834 0 D815  STD EMESG&5 SAVE DATA MESSAGE 30407580
* 30407590
0835 0 690F  STX 1 EMESG SAVE MESSAGE ID NO 30407600
* 30407610
***** 30407620
0836 0 4480 0162  BSI I ERROR * 30407630
0838 1 0845  DC EMESG MESSAGE ADDR * 30407640
0839 0 0000  DC LOOP ON ERR - NONE * 30407650
***** 30407660
083A 0 6303  LDX 3 3 RESET MODIFIER WORD CNT 30407670
083B 0 680B  STX 3 EMESG&2 30407680
083C 1 6700 0A28  LDX L3 PTR0 RESTORE XR3 30407690
083E 1 4C80 0833  BSC I PRDSW RETURN TO USER 30407700
* 30407710
* 30407720
0840 1 6D00 05E5  PDSWX STX L1 MLSCF 30407730
0842 0 4480 0161  BSI I START 30407740
* 30407750
0844 0 0000  BSS E 30407760
0844 0 E000  KE000 DC /E000 ERROR ID 30407770
0845 0 0000  EMESG DC /0000 MESSAGE ID NO 30407780
0846 0 0000  DC /0000 HEX OUTPUT 30407790
0847 0 0003  DC /0003 DATA ID WORD 30407800
0848 0 0000  DC /0000 ALPHA ADDR 30407810
0849 0 0000  DC /0000 ALPHA ADDR 30407820
084A 0 0000  DC /0000 DSWAS 30407830
084B 0 0000  DC /0000 DSW S/B 30407840
* 30407850
* 30407860
084C 0 0000  TIMEX DC /0000 DELAY TIME STORAGE 30407870
084D 0 000B  ELVEN DC 11 30407880
***** 30407890
* 30407900
* PRINTER TEST SEQUENCE 30407910
* CONTROL TABLE 30407920
* 30407930
084E 1 0859  FUNR DC ANY KEYBOARD OPTION 30407940
084F 1 08FA  DC TACAR TAB & CARRIER RETURN 30407950
0850 1 090B  DC UCASE UPPER CASE CHARS 30407960
0851 1 0927  DC LCASE LOWER CASE CHARS 30407970
0852 1 0943  DC COLOR COLOR SHIFT ROUTINE 30407980
0853 1 0959  DC SPNDX BACKSPACE AND INDEX 30407990
0854 1 0977  DC AUCAR AUTO CARRIER RETURN 30408000
0855 1 0992  DC ROCK TEST TILT 30408010
0856 1 09C4  DC ROLL TEST ROTATE 30408020
0857 1 09F6  DC TWIST TEST TILT AND ROTATE 30408030
0858 0 FFFF  FUND DC /FFFF * 30408040
***** 30408050
* 30408060
* KEYBOARD OPTION TABLE 30408070
* 30408080
0859 0 0001  ANY DC 1 ITCNT 30408090
085A 0 05FF  DC /05FF BLACK 30408100
085B 0 FFFF  DC /FFFF ITCNT 30408110
085C 0 0000  DC /0000 30408120
085D 0 0000  DC /0000 30408130
085E 0 0000  DC /0000 30408140
085F 0 0000  DC /0000 30408150
0860 0 0000  DC /0000 30408160
0861 0 0000  DC /0000 30408170

```

0862 0 0000 DC /0000
0863 0 0000 DC /0000
0864 0 0000 DC /0000
0865 0 0000 DC /0000
0866 0 0000 DC /0000
0867 0 0000 DC /0000
0868 0 0000 DC /0000
0869 0 0000 DC /0000
086A 0 0000 DC /0000
086B 0 0000 DC /0000
086C 0 0000 DC /0000
086D 0 0000 DC /0000
086E 0 0000 DC /0000
086F 0 0000 DC /0000
0870 0 0000 DC /0000
0871 0 0000 DC /0000
0872 0 0000 DC /0000
0873 0 0000 DC /0000
0874 0 0000 DC /0000
0875 0 FFFF DC /FFFF

*
*
* END PROGRAM ROUTINE
*

0876 0 4480 0164

TYEND BSI I END *

*
* KEYBOARD CODE TABLE
*

Address	Code	Value	Description
0878 0 4220	KECOD DC	/4220	*
0879 0 3000	DC	/3000	/
087A 0 2000	DC	/2000	0
087B 0 1000	DC	/1000	1
087C 0 0800	DC	/0800	2
087D 0 0400	DC	/0400	3
087E 0 0200	DC	/0200	4
087F 0 0100	DC	/0100	5
0880 0 0080	DC	/0080	6
0881 0 0040	DC	/0040	7
0882 0 0020	DC	/0020	8
0883 0 0010	DC	/0010	9
0884 0 4420	DC	/4420	\$
0885 0 8420	DC	/8420	.
0886 0 2420	DC	/2420	,
0887 0 00A0	DC	/00A0	#
0888 0 0120	DC	/0120	@
0889 0 8120	DC	/8120	%
088A 0 4120	DC	/4120	□
088B 0 80A0	DC	/80A0	&
088C 0 4000	DC	/4000	-
088D 0 8820	DC	/8820	CENT SIGN
088E 0 8220	DC	/8220	LESS THAN
088F 0 8060	DC	/8060	LOGICAL OR
0890 0 8000	DC	/8000	AND
0891 0 4820	DC	/4820	EXCLAMATION
0892 0 40A0	DC	/40A0	SEMI COLON
0893 0 4060	DC	/4060	LOGICAL NOT
0894 0 2220	DC	/2220	PER CENT
0895 0 2120	DC	/2120	UNDERScore
0896 0 20A0	DC	/20A0	GREATER THAN
0897 0 2060	DC	/2060	QUESTION MARK
0898 0 0820	DC	/0820	COLON
0899 0 0420	DC	/0420	NUMBERS
089A 0 0220	DC	/0220	AT
089B 0 0060	DC	/0060	QUOTE

30408180
30408190
30408200
30408210
30408220
30408230
30408240
30408250
30408260
30408270
30408280
30408290
30408300
30408310
30408320
30408330
30408340
30408350
30408360
30408370
30408380
30408390
30408400
30408410
30408420
30408430
30408440
30408450
30408460
30408470
30408480
30408490
30408500
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30408520
30408530
30408540
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30408560
30408570
30408580
30408590
30408600
30408610
30408620
30408630
30408640
30408650
30408660
30408670
30408680
30408690
30408700
30408710
30408720
30408730
30408740
30408750
30408760
30408770
30408780
30408790
30408800
30408810
30408820
30408830
30408840
30408850

089C 0 9000
089D 0 8800
089E 0 8400
089F 0 8200
08A0 0 8100
08A1 0 8080
08A2 0 8040
08A3 0 8020
08A4 0 8010
08A5 0 5000
08A6 0 4800
08A7 0 4400
08A8 0 4200
08A9 0 4100
08AA 0 4080
08AB 0 4040
08AC 0 4020
08AD 0 4010
08AE 0 2800
08AF 0 2400
08B0 0 2200
08B1 0 2100
08B2 0 2080
08B3 0 2040
08B4 0 2020
08B5 0 2010
08B6 0 0000
08B7 0 2820
08B8 0 0008
08B9 0 D6D6
08BA 0 BCBC
08BB 0 C4C4
08BC 0 FCFC
08BD 0 D8D8
08BE 0 DCDC
08BF 0 F0F0
08C0 0 F4F4
08C1 0 D0D0
08C2 0 D4D4
08C3 0 E4E4
08C4 0 E0E0
08C5 0 4040
08C6 0 0000
08C7 0 8080
08C8 0 C2C2
08C9 0 E6E6
08CA 0 FEFE
08CB 0 F6F6
08CC 0 DADA
08CD 0 8484
08CE 0 0202
08CF 0 DEDE
08D0 0 C6C6
08D1 0 4444
08D2 0 4242
08D3 0 D2D2
08D4 0 F2F2
08D5 0 0606
08D6 0 BEBE
08D7 0 4646
08D8 0 8686
08D9 0 8282
08DA 0 C0C0
08DB 0 0404
08DC 0 E2E2

DC /9000 A
DC /8800 B
DC /8400 C
DC /8200 D
DC /8100 E
DC /8080 F
DC /8040 G
DC /8020 H
DC /8010 I
DC /5000 J
DC /4800 K
DC /4400 L
DC /4200 M
DC /4100 N
DC /4080 O
DC /4040 P
DC /4020 Q
DC /4010 R
DC /2800 S
DC /2400 T
DC /2200 U
DC /2100 V
DC /2080 W
DC /2040 X
DC /2020 Y
DC /2010 Z
DC /0000 SPACE
DC /2820 0 - 8 - 2
DC /0008 EOF

*
* PRINTER CODE TABLE
*
*
*
* TYCOD DC

Address	Code	Value	Description
08B9 0 D6D6	TYCOD DC	/D6D6	*
08BA 0 BCBC	DC	/BCBC	/
08BB 0 C4C4	DC	/C4C4	0
08BC 0 FCFC	DC	/FCFC	1
08BD 0 D8D8	DC	/D8D8	2
08BE 0 DCDC	DC	/DCDC	3
08BF 0 F0F0	DC	/F0F0	4
08C0 0 F4F4	DC	/F4F4	5
08C1 0 D0D0	DC	/D0D0	6
08C2 0 D4D4	DC	/D4D4	7
08C3 0 E4E4	DC	/E4E4	8
08C4 0 E0E0	DC	/E0E0	9
08C5 0 4040	DC	/4040	\$
08C6 0 0000	DC	/0000	.
08C7 0 8080	DC	/8080	,
08C8 0 C2C2	DC	/C2C2	#
08C9 0 E6E6	DC	/E6E6	@
08CA 0 FEFE	DC	/FEFE	%
08CB 0 F6F6	DC	/F6F6	□
08CC 0 DADA	DC	/DADA	&
08CD 0 8484	DC	/8484	-
08CE 0 0202	DC	/0202	CENTS SIGN
08CF 0 DEDE	DC	/DEDE	LESS THAN
08D0 0 C6C6	DC	/C6C6	LOGICAL OR
08D1 0 4444	DC	/4444	AND
08D2 0 4242	DC	/4242	EXCLAMATION
08D3 0 D2D2	DC	/D2D2	SEMI COLON
08D4 0 F2F2	DC	/F2F2	LOGICAL NOT
08D5 0 0606	DC	/0606	PERCENT SIGN
08D6 0 BEBE	DC	/BEBE	UNDERScore
08D7 0 4646	DC	/4646	GREATER THAN
08D8 0 8686	DC	/8686	QUESTION MARK
08D9 0 8282	DC	/8282	COLON
08DA 0 C0C0	DC	/C0C0	NUMBERS
08DB 0 0404	DC	/0404	AT
08DC 0 E2E2	DC	/E2E2	QUOTE

0953 0 0014	DC	20	ITCNT
0954 0 0952	DC	/0952	RED 0
0955 0 1105	DC	/1105	BSP BLK
0956 0 DA21	DC	/DA21	+ SP
0957 0 21FF	DC	/21FF	SP
0958 0 FFFF	DC	/FFFF	

*
*
* BACK SPACE AND INDEX
*

0959 0 0001	SPNDX DC	1	ITCNT
095A 0 8181	DC	/8181	CR CR
095B 0 45FF	DC	/45FF	BLACK
095C 0 0002	DC	2	ITCNT
095D 0 3611	DC	/3611	E *
095E 0 111E	DC	/111E	* C
095F 0 1111	DC	/1111	* *
0960 0 3E11	DC	/3E11	A *
0961 0 1156	DC	/1156	* P
0962 0 1111	DC	/1111	* *
0963 0 9A11	DC	/9A11	S *
0964 0 1111	DC	/1111	* *
0965 0 5A11	DC	/5A11	K *
0966 0 111E	DC	/111E	* C
0967 0 1111	DC	/1111	* *
0968 0 3E11	DC	/3E11	A *
0969 0 111A	DC	/111A	* B
096A 0 8141	DC	/8141	CR TAB
096B 0 2203	DC	/2203	I LF
096C 0 1176	DC	/1176	BS N
096D 0 0311	DC	/0311	LF BS
096E 0 3203	DC	/3203	D LF
096F 0 1136	DC	/1136	BS E
0970 0 0311	DC	/0311	LF BS
0971 0 9603	DC	/9603	X LF
0972 0 1103	DC	/1103	BS LF
0973 0 09FF	DC	/09FF	RED
0974 0 0002	DC	2	ITCNT
0975 0 85FF	DC	/85FF	CR
0976 0 FFFF	DC	/FFFF	

*
*
* AUTOMATIC CARRIER RETURN *
*

0977 0 0001	AUCAR DC	/0001	ITCNT
0978 0 85FF	DC	/85FF	BLACK
0979 0 0001	DC	1	ITCNT
097A 0 1E3C	DC	/1E3C	C A
097B 0 6060	DC	/6060	R R
097C 0 2034	DC	/2034	I E
097D 0 6021	DC	/6021	R
097E 0 6034	DC	/6034	R E
097F 0 9CB0	DC	/9CB0	T U
0980 0 6074	DC	/6074	R N
0981 0 21FF	DC	/21FF	
0982 0 0078	DC	120	ITCNT
0983 0 21FF	DC	/21FF	SPACE
0984 0 0001	DC	1	ITCNT
0985 0 09FF	DC	/09FF	RED
0986 0 0001	DC	1	ITCNT
0987 0 1E3C	DC	/1E3C	C A
0988 0 6060	DC	/6060	R R
0989 0 2034	DC	/2034	I E
098A 0 6021	DC	/6021	R
098B 0 6034	DC	/6034	R E
098C 0 9CB0	DC	/9CB0	T U
098D 0 6074	DC	/6074	R N
098E 0 21FF	DC	/21FF	

30410900
30410910
30410920
30410930
30410940
30410950
30410960
30410970
30410980
30410990
30411000
30411010
30411020
30411030
30411040
30411050
30411060
30411070
30411080
30411090
30411100
30411110
30411120
30411130
30411140
30411150
30411160
30411170
30411180
30411190
30411200
30411210
30411220
30411230
30411240
30411250
30411260
30411270
30411280
30411290
30411300
30411310
30411320
30411330
30411340
30411350
30411360
30411370
30411380
30411390
30411400
30411410
30411420
30411430
30411440
30411450
30411460
30411470
30411480
30411490
30411500
30411510
30411520
30411530
30411540
30411550
30411560
30411570

098F 0 0078
0990 0 21FF
0991 0 FFFF

0992 0 0001
0993 0 85FF
0994 0 0002
0995 0 81C0
0996 0 8040
0997 0 0020
0998 0 60A0
0999 0 E0D0
099A 0 9050
099B 0 1030
099C 0 70B0
099D 0 F0D8
099E 0 9858
099F 0 1804
09A0 0 4484
09A1 0 C4E4
09A2 0 A464
09A3 0 2414
09A4 0 5494
09A5 0 D4F4
09A6 0 B474
09A7 0 341C
09A8 0 5C9C
09A9 0 DCFC
09AA 0 BC7C
09AB 0 3C21
09AC 0 0242
09AD 0 82C2
09AE 0 E2A2
09AF 0 6222
09B0 0 1252
09B1 0 92D2
09B2 0 F2B2
09B3 0 7232
09B4 0 1A5A
09B5 0 9ADA
09B6 0 C686
09B7 0 4606
09B8 0 2666
09B9 0 A6E6
09BA 0 D696
09BB 0 5616
09BC 0 3676
09BD 0 B6F6
09BE 0 DE9E
09BF 0 5E1E
09C0 0 3E7E
09C1 0 BEFE
09C2 0 09FF
09C3 0 FFFF

09C4 0 0001
09C5 0 85FF
09C6 0 0002
09C7 0 81C0
09C8 0 E0D0
09C9 0 F0D8
09CA 0 C4E4
09CB 0 D4F4
09CC 0 DCFC
09CD 0 BC9C
09CE 0 B494

*
* ROCK

*
* ROLL

DC	120	ITCNT
DC	/21FF	SPACE
DC	/FFFF	
DC	1	ITCNT
DC	/85FF	BLACK
DC	2	ITCNT
DC	/81C0	CR NOS
DC	/8040	,
DC	/0020	.
DC	/60A0	R Z
DC	/E0D0	9 6
DC	/9050	W 0
DC	/1030	F D
DC	/70B0	M U
DC	/F0D8	4 2
DC	/9858	S K
DC	/1804	B AT
DC	/4484	AND -
DC	/C4E4	O 8
DC	/A464	Y Q
DC	/2414	H G
DC	/5494	P X
DC	/D4F4	7 5
DC	/B474	V N
DC	/341C	E C
DC	/5C9C	L T
DC	/DCFC	3 1
DC	/BC7C	/ J
DC	/3C21	A
DC	/0242	CNT ECX
DC	/82C2	CLN #
DC	/E2A2	QTE Z
DC	/6222	R LOR
DC	/1252	F Q
DC	/92D2	W SMI
DC	/F2B2	I U
DC	/7232	M D
DC	/1A5A	B K
DC	/9ADA	S T
DC	/C686	LNT QSN
DC	/4606	GTR PCT
DC	/2666	H Q
DC	/A6E6	Y @
DC	/D696	* X
DC	/5616	P G
DC	/3676	E N
DC	/B6F6	V □
DC	/DE9E	LES T
DC	/5E1E	L C
DC	/3E7E	A J
DC	/BEFE	UDR %
DC	/09FF	RED
DC	/FFFF	
DC	1	ITCNT
DC	/85FF	BLACK
DC	2	ITCNT
DC	/81C0	CR NOS
DC	/E0D0	9 6
DC	/F0D8	4 2
DC	/C4E4	O 8
DC	/D4F4	7 5
DC	/DCFC	3 1
DC	/BC9C	/ T
DC	/B494	V X

1131 KEYBOARD-PRINTER TEST

09CF 0 A484	DC	/A484	Y -
09D0 0 98B0	DC	/98B0	S U
09D1 0 90A0	DC	/90A0	W Z
09D2 0 8040	DC	/8040	, \$
09D3 0 6050	DC	/6050	R 0
09D4 0 7058	DC	/7058	M K
09D5 0 4464	DC	/4464	AND Q
09D6 0 5474	DC	/5474	P N
09D7 0 5C7C	DC	/5C7C	L J
09D8 0 3C1C	DC	/3C1C	A C
09D9 0 3414	DC	/3414	E G
09DA 0 2404	DC	/2404	H AT
09DB 0 1830	DC	/1830	B D
09DC 0 1020	DC	/1020	F I
09DD 0 0021	DC	/0021	.
09DE 0 3E1E	DC	/3E1E	A C
09DF 0 3616	DC	/3616	E G
09E0 0 2606	DC	/2606	H PCT
09E1 0 1A32	DC	/1A32	B D
09E2 0 1222	DC	/1222	F I
09E3 0 0242	DC	/0242	CNT EXC
09E4 0 6252	DC	/6252	R 0
09E5 0 725A	DC	/725A	M K
09E6 0 4666	DC	/4666	GTR Q
09E7 0 5676	DC	/5676	P N
09E8 0 5E7E	DC	/5E7E	L J
09E9 0 BE9E	DC	/BE9E	UDR T
09EA 0 B696	DC	/B696	V X
09EB 0 A686	DC	/A686	Y QSN
09EC 0 9AB2	DC	/9AB2	S U
09ED 0 92A2	DC	/92A2	W Z
09EE 0 82C2	DC	/82C2	CLN #
09EF 0 E2D2	DC	/E2D2	QTE SMI
09F0 0 F2DA	DC	/F2DA	LNT &
09F1 0 C6E6	DC	/C6E6	LOR @
09F2 0 D6F6	DC	/D6F6	* □
09F3 0 DEFE	DC	/DEFE	LES %
09F4 0 29FF	DC	/29FF	RED
09F5 0 FFFF	DC	/FFFF	
* *			
09F6 0 0001	DC	1	ITCNT
09F7 0 85FF	DC	/85FF	BLACK
09F8 0 0002	DC	2	ITCNT
09F9 0 81C0	DC	/81C0	CR NOS
09FA 0 3E80	DC	/3E80	A ,
09FB 0 7E40	DC	/7E40	J \$
09FC 0 BE00	DC	/BE00	UDR .
09FD 0 FE20	DC	/FE20	% I
09FE 0 DE60	DC	/DE60	LES R
09FF 0 9EA0	DC	/9EA0	T Z
0A00 0 5EE0	DC	/5EE0	L 9
0A01 0 1ED0	DC	/1ED0	C 6
0A02 0 3690	DC	/3690	E W
0A03 0 7650	DC	/7650	N 0
0A04 0 B610	DC	/B610	V F
0A05 0 F630	DC	/F630	□ D
0A06 0 D670	DC	/D670	* M
0A07 0 96B0	DC	/96B0	X U
0A08 0 56F0	DC	/56F0	P 4
0A09 0 16D8	DC	/16D8	G 2
0A0A 0 2698	DC	/2698	H S
0A0B 0 6658	DC	/6658	Q K
0A0C 0 A618	DC	/A618	Y B
0A0D 0 E604	DC	/E604	@ AT
0A0E 0 C644	DC	/C644	LOR AND
0A0F 0 8684	DC	/8684	QSN -
0A10 0 46C4	DC	/46C4	GTR 0

30412260
30412270
30412280
30412290
30412300
30412310
30412320
30412330
30412340
30412350
30412360
30412370
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30412390
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30412410
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30412480
30412490
30412500
30412510
30412520
30412530
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30412550
30412560
30412570
30412580
30412590
30412600
30412610
30412620
30412630
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30412670
30412680
30412690
30412700
30412710
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30412890
30412900
30412910
30412920
30412930

1131 KEYBOARD-PRINTER TEST

0A11 0 06E4
0A12 0 1AA4
0A13 0 5A64
0A14 0 9A24
0A15 0 DA14
0A16 0 F254
0A17 0 B294
0A18 0 72D4
0A19 0 32F4
0A1A 0 12B4
0A1B 0 5274
0A1C 0 9234
0A1D 0 D21C
0A1E 0 E25C
0A1F 0 A29C
0A20 0 62DC
0A21 0 22FC
0A22 0 02BC
0A23 0 427C
0A24 0 823C
0A25 0 C225
0A26 0 29FF
0A27 0 FFFF

DC /06E4 PCT 8
DC /1AA4 B Y
DC /5A64 K Q
DC /9A24 S H
DC /DA14 & G
DC /F254 LNT P
DC /B294 U X
DC /72D4 M 7
DC /32F4 D 5
DC /12B4 F V
DC /5274 O N
DC /9234 W E
DC /D21C SMI C
DC /E25C QTE L
DC /A29C Z T
DC /62DC R 3
DC /22FC I 1
DC /02BC CNT /
DC /427C EXC J
DC /823C CLN A
DC /C225 % BLACK
DC /29FF RED
DC /FFFF

*
* PRINTER OUTPUT STATUS
* TABLES
* PRINTER NO 0

BSS E 0	LABEL	30413230
DC TACAR	WORD POINTER	ADR 30413240
DC 2	TEST POINTER	RTN 30413250
DC /8000	PTR STATUS	STS 30413260
* /A000	SELECT KBD	30413270
* /C000	READ KBD NEXT	30413280
* /FC00-FFFF	COUNT FOR INTERRUPT	30413290
* /FFFF	LOST INT ERROR	30413300
* /E000	WAIT TYP READ INTERT	30413310
* /F000	WAIT KBD INT	30413320
* /8000	IGNORE	30413330
DC /81FF	NEXT PTR OUTPUT WORD	OUT 30413340
DC 1	ITERATION COUNT	ITR 30413350
DC 1	SHIFT WORD	SLT 30413360
DC	WORDS PRINTED	NOS 30413370
DC	LAST ITCNT ADDR PT	PAD 30413380
DC PTR0&OUT		WRT 30413390
DC /0900	WRITE COMMAND	30413400
DC 0		PTR 30413410
DC /0F01	SENSE DSW COMMAND	30413420
DC	SENSE - NO RESET	SNR 30413430
DC /0F00		30413440
DC		KEY 30413450
DC /0C00	SELECT KEYBOARD CMD	30413460
DC PTR0&KEY		SEE 30413470
DC /0A00	READ KEYBOARD CMD	30413480
DC /0000	ERROR DSW WAS	ERR 30413490
DC /0000	DSW SHOULD HAVE BEEN	30413500
RDBS DC BITSW		30413510
DC /3A00		30413520
DC /0000		30413530
* DC		30413540
* DC		30413550
* DC	KEYBOARD - CONSOLE SWITCH	30413560
* DC	STATUS ROUTINE	30413570
* DC		30413580
* DC	THIS ROUTINE PRINTS ANY	30413590
* DC	CHANGE IN THE STATUS OF	30413600
* DC	OF THE CONSOLE/KEYBOARD	30413610

```

*          SWITCH. IF NO CHANGE          30413620
*          IS MADE THEN NOTHING IS      30413630
*          PRINTED.                      30413640
*                                         30413650
*                                         30413660
OA3F 0 0000      SWSET DC                30413670
OA40 0 08F3      XIO      SNR&PTR0  SENSE DEVICE STATUS 30413680
OA41 0 F03E      EOR      LAST      CHECK SWITCH SETTING 30413690
OA42 1 E400 OA82 AND  L  K1000                                30413700
OA44 0 E83C      OR      FIRST                                30413710
OA45 1 4C98 OA3F BSC  I  SWS&T,-  RETURN IF NOT CNGED 30413720
*                                         30413730
*          XIO      SNR&PTR0  SENSE DEVICE STATUS 30413740
OA47 0 08EC      AND  L  K1000                                30413750
OA48 1 E400 OA82 STO      LAST                                30413760
OA4A 0 D035      BSC  L  SWSC,Z  BR IF IN CONSOLE 30413770
OA4B 1 4C20 OA58 *                                         30413780
*          LD  L  TWLVE      SET ROUTINE NO. 30413790
OA4D 1 C400 0641 STO  L  RID                                30413800
OA4F 1 D400 05DD *                                         30413810
*          SLA      16                                         30413820
OA51 0 1010      STO  L  ANY&3                                30413830
OA52 1 D400 085C *                                         30413840
*          LDX  L1 /A000      SET TO SELECT KBD NEXT 30413850
OA54 0 6500 A000 LD      KBMES      KEYBOARD MESSAGE 30413860
OA56 0 C02C      MDX      SWSP      GO PRINT THE SWS 30413870
OA57 0 701A      *                                         30413880
*          SWSC BSI  L  ENDM      TERMINATE KBD ENTRY 30413890
OA58 1 4400 0812 SRA      16                                30413900
OA5A 0 1810      LD  L  SW1                                30413910
OA5B 1 C400 05E0 RTE      1                                30413920
OA5D 0 18C1      BSC  Z                                30413930
OA5E 0 4820      SLT  1                                30413940
OA5F 0 1081      STO  *E1                                30413950
OA60 0 D001      LDX  L1 /0000                                30413960
OA61 0 6500 0000 LD  L  ANY&2      CHECK IF ANY KBD ENTRY 30413970
OA63 1 C400 085B BSC  -                                30413980
OA65 0 4810      LDX  1 1      BR IF TABLE EMPTY 30413990
OA66 0 6101      SWSD STX  1 RTN&PTR0 SET TO LOOP RTN 1 30414000
OA67 0 69C1      LD  L1 FUNR                                30414010
OA68 1 C500 084E STO  ADR&PTR0                                30414020
OA6A 0 D0BD      LD  L  ANY&1                                30414030
OA6B 1 C400 085A STO  OUT&PTR0                                30414040
OA6D 0 D0BD      *                                         30414050
*          SWSE STX  L1 SW1      SET OR CLEAR LOOP RTN 30414060
OA6E 1 6D00 05E0 XIO  SEE&PTR0 DESELECT KEYBOARD 30414070
OA70 0 08C7      *                                         30414080
*          LD      CNMES      CONSOLE MESSAGE 30414090
OA71 0 C018      *                                         30414100
*          SWSP STO      LOGM&4  SAVE MESSAGE 30414110
OA72 0 D00C      STX  1 STS&PTR0 SET PRINTER STATUS 30414120
OA73 0 69B6      SLA      16                                30414130
OA74 0 1010      STO  FIRST      RESET FIRST INDICATOR 30414140
OA75 0 D00B      *****
*          BSI  I  LOG      * 30414150
OA76 0 4480 0163 DC      LOGM      ADRS OF MESS * 30414160
OA78 1 OA7B      *****
*          BSC  L  GO3      RETURN TO MAINLINE 30414170
OA79 1 4C00 065C *                                         30414180
*          LOGM DC      /0000                                30414190
OA7B 0 0000      DC      /0000                                30414200
OA7C 0 0000      DC      /0000                                30414210
OA7D 0 0000      DC      /0000                                30414220
OA7E 0 0000      DC      /0000                                30414230
OA7F 0 0000      DC      /0000                                30414240
*          *                                         30414250
*          *                                         30414260
OA80 0 0000      LAST DC      /0000      LAST KBD/CNSL SW SET 30414270
OA81 1 OA81      FIRST DC      FIRST      PROG RESRT INDICATOR 30414280
OA82 0 1000      K1000 DC      /1000      CONSTANT 30414290

```

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*          *          30414300
*          KBMES DC      KBMES&1 30414310
OA83 1 OA84      DC      /5A36      KEYBOARD 30414320
OA84 0 5A36      DC      /A61A      30414330
OA85 0 A61A      DC      /523E      30414340
OA86 0 523E      DC      /6232      30414350
OA87 0 6232      DC      /8100      30414360
OA88 0 8100      DC      /FFFF      TERMINATOR 30414370
OA89 0 FFFF      *          *          30414380
*          CNMES DC      CNMES&1 30414390
OA8A 1 OA8B      DC      /1E52      CONSOLE 30414400
OA8B 0 1E52      DC      /769A      30414410
OA8C 0 769A      DC      /525E      30414420
OA8D 0 525E      DC      /3600      30414430
OA8E 0 3600      DC      /FFFF      TERMINATOR 30414440
OA8F 0 FFFF      *****
*          *          30414450
OA90 0643      END      TYCUS 30414460
NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY 30414470

```

1131 KEYBOARD-PRINTER TEST

C R O S S R E F E R E N C E

NAME	VALUE	REFERENCES
ADR	0000	06DE,06E3,0A6A
ALL	0734	072E
ANY	0859	0615,061B,064B,065A,065E,07E3,07E5,0802,0806,080D,0813,0819,081D,081F,0823,0826,082A,084E,0A52,0A63,0A6B
AUCAR	0977	0854
BASIC	0735	072A
BEGIN	0160	0643
BITSW	0A3E	06B9,0A3C
BSPSE	07CD	080F
BSYOK	0755	075E
CMPRE	07D0	07B1
CNMES	0A8A	0A71,0A8A
CNVRT	07AE	07B4
COLOR	0943	0852
COMIN	05E7	0639,073A,0781,07F2
COMIX	0639	061D,0623,0630
COMI3	05FD	05F8
DSWAS	076F	0742,0746,0788,078B,078F
DSWBS	0771	0776,0777,0795,079A
DSWBY	076D	0752,0757
DSWIT	063D	05EA,05FF,0607,061F,0625,062C,0632
ELVEN	084D	06A4,06A8
EMESG	0845	07BE,0834,0835,0838,083B
END	0164	0876
ENDM	0812	0831,0A58
ENDM1	0821	081B
ENDM2	0829	0816
ENDM3	082B	0828
ERIND	0640	0618,0638,064D,066C,0760
ERLCK	0166	
ERR	0012	0637,0762,0768
ERROR	0162	0836
ERSE	07F9	07BB
ERSEA	07CC	07F9,07FA
ERSE1	0809	07FF
ERSE2	080F	0808
ERSLC	07C9	07B9
EXEC3	068D	0678
EXEC7	0693	07A1
EXEC9	0696	0687,068A,06CA,0714
EXIT	07E9	07DF,07EC
FIRST	0A81	0646,0A44,0A75,0A81
FUND	0858	0734,0825,0829
FUNR	084E	06D4,06D9,0734,0A68
FQ200	0772	0796,079C
GO	0646	05DE,05E3,05E4
GO3	065C	0A79
I	069C	06BF,06C1,06E1,0704,070B,0717,071D
IL0	017A	
IL1	018A	
IL2	019A	
IL3	01AA	
IL4	01BA	
INERR	075F	066D
ITR	0004	0660,06D6,0716,0719,0723
KA000	063C	05FB,05FD,060A
KBDRQ	0603	05ED
KBDSV	062A	05F3
KBD2	060A	0604
KBEOO	0642	0608
KBMES	0A83	0A56,0A83
KCNLS	0774	0600,0626,0633,0747,0758,0778,0790,079B
KCOOO	063F	062A
KECOD	0878	07AE
KEFFF	0773	0620,062E,0743,0753,078C,0797
KEY	000E	0793,07B0,07B5,07BA,07C1,0A38

1131 KEYBOARD-PRINTER TEST

KEYBD	07A3	0685
KEYER	0636	0602,0609,0629
KE000	0844	05F6,07E9
KFFE7	07C8	07FB
KFF00	0770	0713
KF000	07CF	05F1,0789
KF800	069E	068F
KOC00	076E	0754,0759
K0001	069F	0681,0684
K0008	07CE	082B
K1000	0A82	0A42,0A48
K4200	063B	062D,0635
K8000	063E	0622,0628,0779
LAST	0A80	0A41,0A4A
LCASE	0927	0851
LOG	0163	0A76
LOGBY	0167	0736,07EE
LOGM	0A7B	0A72,0A78
LOWER	07C7	07C5,07D2,07D8
MARK	06A0	0755
MARKE	0731	072D
MARKG	06E3	06A6,070E
MARKL	06E5	06D2
MARKN	0712	0709
MARKP	06FD	06E7,06EE,06FC
MARKQ	06FF	06E8
MARKR	0701	06E9
MARKS	070A	0706
MARKT	06B4	06AD
MARKU	06B5	06AC,06B4
MARKZ	06FC	06F6
MARK1	06BB	06C4,06C9
MARK2	06CB	06DB
MARK3	06CD	072B,072F
MARK4	06CE	0733
MARK5	06D9	071A,0726
MLSCF	05E5	0698,06AE,06F8,0840
NCAP	07C8	07B6
NOCP	07C5	07B7
NOIN	0775	068B
NOS	0006	0663,06E0,070A,070C,071C,071F
OUT	0003	06C3,0712,07D6,0810,0A30,0A6D
PAD	0007	0664,06D8,06DD,0720,0721
PDSWX	0840	074E,07F0
PID	05DC	0645
PRCON	066C	066B,0696,0769,077F,0798,07F7
PRDSW	0833	074A,075C,0765,077D,079F,07A9,07C2,083E
PTR	000A	0741,0751,0775,0787,0794,07A4
PTRO	0A28	05E8,0648,065C,0674,0688,0694,06CE,06E3,06E5,06EA,06F0,073E,0762,082C,083C,0A30,0A38,0A40,0A47,0A67,0A6A,0A6D,0A70,0A73
RAD	05DE	
RDBS	0A3C	0687
RDY2	074C	0738
READY	0736	0691,074C
RED1	0909	0821
RESTO	069D	0677,0693
RID	05DD	064F,066F,06AA,06D0,06EC,06F2,0A4F
RLCF	0168	
ROCK	0992	0855
ROLL	09C4	0856
RQKB	01BC	0783
RQTY	01BB	073C,07F4
RTN	0001	060E,06CE,06E5,06EA,06F0,0A67
RTNSW	0165	06B0,06F4
SEE	0010	060C,07A3,0A70
SELC	0793	078D
SELC1	079E	0792
SELC2	0781	0682,07C4,07C6,07FC

1131 KEYBOARD-PRINTER TEST

SFT 07E0 07DB
SLT 0005 0661,06E2,0703,0705
SLTWD 07CA 0613,0669,07D9,07E7,07FE,081A
SNR 000C 0A40,0A47
SPNDX 0959 0853
START 0161 069A,06B2,06FA,0842
STS 0002 05F0,05F5,05FE,060B,061E,062B,0648,0676,0688,0690,0694,078A,07EB
082C,0A73
SVC 0688 067E
SVKB 01BD 0785
SWSC 0A58 0A4B
SWSD 0A67
SWSE 0A6E
SWSET 0A3F 0672,068D,0A45
SWSP 0A72 0A57
SWG 05DF
SW1 05E0 0651,0656,06A0,0728,082F,0A5B,0A6E
SW2 05E1
SW3 05E2
TACAR 08FA 084F,0A28
TBLI 07E7 0811
TBLIS 07E5 07DE
TBLIZ 07E3 07E2
TERM 05E6 0724
TIMEX 084C
TWIST 09F6 0857
TWLVE 0641 060D,0671,0A4D
TYCOD 08B9 0700
TYCUS 0643 0A90
TYEND 0876 067B,06CB
TYPIT 0750 0744
TYPV 061E 05FC
UCASE 090B 0850
WRDCT 07AB 0610,0666,07A6,07E8,0814
WRT 0008 0750,07F6

END OF ASSEMBLY

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